Prepared for

WILSONVILLE
OREGON

Wilsonville DW Fritz

Transportation Impact Analysis

Prepared by

DKS

August 2017

Exhibit A3
DB22-0004

117 Commercial St NE
Suite 310
Salem, OR 97301
503.391.8773
dksassociates.com

August 14, 2017

Steve Adams
City of Wilsonville
29799 Town Center Loop East
Wilsonville, OR 97070

Subject: Wilsonville DW Fritz Transportation Impact Study P17021-003

Dear Steve,

DKS Associates is pleased to submit this transportation impact study for the proposed DW Fritz renovation and addition located at 9600 SW Boeckman Road in Wilsonville. Please feel free to call if you have any questions or comments regarding this study.

Sincerely,
DKS Associates

Scott Mansur, P.E., PTOE
Transportation Engineer

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CHAPTER 1: INTRODUCTION AND SUMMARY

This study evaluates the transportation impacts associated with the renovation of the currently vacant 155,000 square foot building located at 9600 SW Boeckman Road and the addition of a 70,000 square foot high tech building and 4,000 square foot sit-down restaurant. The proposed additions are located on the south side of Boeckman Road, just west of the Portland & Western Railroad tracks in Wilsonville, Oregon.

The purpose of this transportation impact analysis is to identify potential mitigation measures needed to offset transportation impacts that the proposed development may have on the nearby transportation network. The analysis evaluated the traffic associated with the existing building and the proposed buildings (since there is no current traffic on the City transportation system). The impact analysis is focused on the study intersections, which were selected for evaluation in coordination with City staff[1]. The intersections are shown in Figure 1 and listed below:

- SW Boones Ferry Road/SW 95th Avenue
- SW Elligsen Road/ I-5 Southbound Ramp
- Boeckman Road/95th Avenue
- Boeckman Road/SW Parkway Avenue
- SW Wilsonville Road/SW Boones Ferry Road
- SW Wilsonville Road/I-5 Southbound Ramp

Figure 1: Study Area

This chapter provides an introduction to the proposed development and the steps taken to analyze the associated impacts on the transportation network. It highlights important elements of the remaining chapters, including a description of the project and the findings of the transportation analysis.

Table 1 lists important characteristics of the study area and proposed project.

[1] Phone conversation with Steve Adams, City of Wilsonville, March 29th, 2017.

Table 1: Key Study Area and Proposed Development Characteristics

Characteristics	Information
Study Area	
Number of Study Intersections	6
Analysis Period	Weekday PM Peak Hour (Peak hour between 4-6 PM)
Project Site	
Existing Land Use	155,000 sq. ft. manufacturing building (currently vacant)
Proposed Development	**Phase 1:** 155,000 sq. ft. manufacturing building renovation **Phase 2:** 70,000 sq. ft. high tech building and 4,000 sq. ft. restaurant
Project Access	Two existing driveways along Boeckman Road

Existing Intersection Operations

Existing traffic operations at the study intersection were determined for the PM peak hour based on the 2000 Highway Capacity Manual methodology for signalized intersections.[2] Table 2 lists the estimated delay, LOS , and v/c ratio of each study intersection. The existing study intersections currently meet mobility targers/operating standards.

Table 2: Existing PM Peak Study Intersection Operations

Intersection	Mobility Targets/ Operating Standard	Existing PM Peak		
		Delay	*LOS*	*v/c*
SW Boones Ferry Road/SW 95th Avenue	LOS D	25.5	C	0.77
SW Elligsen Road/I-5 Southbound Ramp	LOS D and 0.90 v/c[a]	17.7	B	0.79
Boeckman Road/SW 95th Avenue	LOS D	17.2	B	0.44
Boeckman Road/SW Parkway Avenue	LOS D	37.0	D	0.85
SW Wilsonville Road/SW Boones Ferry Road	LOS D	38.3	D	0.78
SW Wilsonville Road/I-5 Southbound Ramp	LOS D and 0.90 v/c[a]	23.6	C	0.52
I-5 Southbound On-Ramp Meter	N/A	-	-	0.91

Delay = Average Intersection Delay (sec.) LOS = Level of Service v/c = Volume-to-Capacity Ratio

[a] The typical ODOT mobility target for interchange ramps is a 0.85 v/c ratio. However, when the interchange vicinity is fully developed and adequate storage is available on the interchange ramp to prevent queues from backing up on the main line, then the target can be increased to a 0.90 v/c ratio. This is the case for the both I-5 interchange areas in Wilsonville.

It is important to note that the intersection operations at the study intersections shown in Table 2 represent typical operations. What this analysis does not include is incurred delay from incidents on the I-5 mainline and the ramp meter on the I-5 southbound ramp at Wilsonville Road that regulates the flow of traffic onto I-5.

[2] *2000 Highway Capacity Manual*, Transportation Research Board, Washington DC, 2000.

The existing capacity of this ramp meter is 1,260 vehicles per hour. If the peak hour demand of the southbound on-ramp exceeds 1,260 vehicles, additional storage would be necessary to prevent spillback and associated impacts on SW Wilsonville Road.

Currently, approximately 1,144 vehicles are entering the southbound on-ramp during the peak hour which results in a volume to capacity (v/c) ratio of 0.91 which is nearing the ramp's full capacity. When traffic incidents occur on I-5 and I-205 such that the additional traffic exceeds the 1,260 vehicles or the I-5 mainline cannot deliver the existing traffic flow, the I-5/SW Wilsonville Road interchange is significantly impacted and vehicles experience traffic delays similar to level of service "F" (greater than 80 seconds of delay).

Proposed Development

The proposed development project will be completed in two phases. The first phase involves renovating the currently vacant 155,000 square-foot building into combined office and warehouse space. The second phase will add a new 70,000 square-foot high tech building and a new 4,000 square-foot sit-down restaurant to the project site. This development will have two existing driveways along Boeckman Road.

Trip Generation

Trip generation is the method used to estimate the number of vehicles added to site driveways and the adjacent roadway network by a development during a specified period (i.e., such as the PM peak hour). For this study, the trip generation was based on the ITE Trip Generation Manual. Table 3 provides the primary trip generation for the proposed renovation (Phase 1) and occupancy of the existing 155,000 square foot building. The development in Phase 1 is expected to generate approximately 105 total (38 in, 67 out) PM peak hour trips.

Table 3: PM Peak Hour Primary Trip Generation Phase 1

Phase	Land Use (ITE Code)	Building area (square feet)	Trip Rate per 1,000 square feet	In	Out	Total
1	Manufacturing (140)	155,000	0.68[a]	38	67	**105**
			Phase 1 Total Primary Trips	38	67	**105**

[a]Rate back-calculated from ITE equation

Table 4 provides the primary trip generation for both the renovated building and the additions of the high tech building and restaurant (Phase 2). It should be noted that the Phase 2 ITE equation trip generation associated with the manufacturing land use is lower than what was assumed in Phase 1. The ITE data has a trip rate that decreases as the total square footage

increases. The proposed Phase 1 and Phase 2 development is expected to generate approximately 183 (75 in, 108 out) PM peak hour primary trips.

Table 4: PM Peak Hour Primary Trip Generation Phases 1 and 2

Phase	Land Use (ITE Code)	Building area (square feet)	Trip Rate per 1,000 square feet	In	Out	Total
1 and 2	Manufacturing (140)	155,000 + 70,000	0.64[a]	52	92	**144**
2	Restaurant (932)	4,000	9.85	23	16	**39**
		Phases 1 and 2 Total Primary Trips		75	108	**183**

[a]Rate back-calculated from ITE equation

As per ITE Trip Generation Handbook guidance,[3] two reductions in primary trips were included in the trip generation analysis; internal trips and pass-by trips. The following paragraphs discuss these reductions and Table 5 displays the total net new trips after accounting for the internal and pass-by trip reductions.

Internal Trips. A reduction of internal trips was evaluated to reduce the total number of driveway trips to account for trips between uses (for example employees from the industrial uses staying to eat at the restaurant). An internal capture rate of 10% was applied to the PM peak hour primary trips of the restaurant.

Pass-By Trips. A reduction of pass-by trips was evaluated to account for traffic that currently exists on the adjacent roadways that the proposed project will have primary access. Pass-by trips are subtracted out after the internal trips are applied and for this project and were only applied to the restaurant trip generation. Pass-by rate of 43% was taken from the ITE Trip Generation Handbook. Pass-by trips result in new driveway trips only and will not increase traffic to the adjacent roadways.

[3] Institute of Transportation Engineers, Trip Generation Handbook, October 1998.

Table 5: PM Peak Hour Net New Trips

	In	Out	Total
Total Primary Trips (Phases 1 and 2)	75	108	**183**
Internal Trip Reduction (10% of restaurant trips)	-2	-2	**-4**
Pass-By Trip Reduction (43% of restaurant trips)	-9	-6	**-15**
Net New Trips (Phase 1 and Phase 2)	64	100	**164**

After reducing the primary project site trips for the restaurant by the internal trip reduction of 10% and then the pass-by trip rate of 43%, the net new total trips to the project site is 164 (64 in/100 out) during the PM peak hour.

Project Trips Through City of Wilsonville Interchange Areas

The project trips through the two City of Wilsonville I-5 interchange areas were estimated based on the trip generation and distribution assumptions. The proposed DW Fritz development is expected to generate 32 PM peak hour trips for Phase 1 and a total of 49 PM peak hour trips for Phases 1 and 2 through the I-5/SW Elligsen Road interchange area. The development is expected to generate 21 PM peak hour trips for Phase 1 and 33 PM peak hour trips for Phases 1 and 2 through the I-5/Wilsonville Road interchange area.

Project Traffic Impact

The impact analysis includes trip generation, trip distribution, and PM peak hour project trips for Phase 1 and Phase 2 of the project. The analysis also includes scenarios that account for Stage II approved developments in the area, including those under construction or built but not yet occupied. The scenarios include:

- Existing + Stage II (includes traffic from other developments with Stage II approval or are under construction)
- Existing + Project (Phase 1)
- Existing + Project (Phase 1) + Stage II
- Existing + Project (Phase 1 and Phase 2)
- Existing + Project (Phase 1 and Phase 2) + Stage II

The study intersection operating conditions for the project trips during Phase 1 development and future Stage II developments are listed in Table 6. All the study intersections meet operating standards for “Existing plus Phase 1,” “Existing plus Stage II,” and “Existing plus Phase 1 plus Stage II” scenarios.

Table 6: Future Phase 1 Project and Stage II Intersection Operations Comparison

Intersection	Mobility Target/ Operating Standard	Existing + Phase 1			Existing + Stage II			Existing + Phase 1 + Stage II		
		Delay	*LOS*	*v/c*	*Delay*	*LOS*	*v/c*	*Delay*	*LOS*	*v/c*
SW Boones Ferry Road/SW 95th Avenue	LOS D	25.7	C	0.77	26.6	C	0.80	26.9	C	0.80
SW Elligsen Road/I-5 Southbound Ramp	LOS D and 0.90 v/c[a]	17.8	B	0.80	20.1	C	0.87	21.0	C	0.88
Boeckman Road/SW 95th Avenue	LOS D	18.7	B	0.45	19.3	B	0.49	20.5	C	0.51
Boeckman Road/SW Parkway Avenue	LOS D	38.9	D	0.87	46.6	D	0.91	49.3	D	0.93
SW Wilsonville Road/SW Boones Ferry Road	LOS D	38.4	D	0.79	51.3	D	0.91	52.7	D	0.92
SW Wilsonville Road/I-5 Southbound Ramp	LOS D and 0.90 v/c[a]	23.5	C	0.52	23.7	C	0.56	23.8	C	0.56
I-5 Southbound On-Ramp Meter	N/A	-	-	0.92	-	-	0.98	-	-	0.99

Delay = Average Intersection Delay (sec.) v/c = Volume-to-Capacity Ratio LOS = Level of Service

[a]The typical ODOT mobility target for interchange ramps is a 0.85 v/c ratio. However, when the interchange vicinity is fully developed and adequate storage is available on the interchange ramp to prevent queues from backing up on the main line, then the target can be increased to a 0.90 v/c ratio. This is the case for the both I-5 interchange areas in Wilsonville.

The study intersection operating conditions for the project trips during both Phase 1 and Phase 2 development and future Stage II developments are listed in Table 7. Again, all the study intersections meet operating standards for “Existing plus Phases 1 and 2,” “Existing plus Stage II,” and “Existing plus Phases 1 and 2 plus Stage II” scenarios.

Table 7: Future Phases 1 and 2 Project and Stage II Intersection Operations Comparison

Intersection	Mobility Target/ Operating Standard	Existing + Phases 1 and 2			Existing + Stage II			Existing + Phases 1 and 2 + Stage II		
		Delay	*LOS*	*v/c*	*Delay*	*LOS*	*v/c*	*Delay*	*LOS*	*v/c*
SW Boones Ferry Road/SW 95th Avenue	LOS D	26.0	C	0.78	26.6	C	0.80	27.1	C	0.81
SW Elligsen Road/I-5 Southbound Ramp	LOS D and 0.90 v/c[a]	17.9	B	0.81	20.1	C	0.87	21.6	C	0.89
Boeckman Road/SW 95th Avenue	LOS D	18.9	B	0.46	19.3	B	0.49	20.7	C	0.50
Boeckman Road/SW Parkway Avenue	LOS D	39.6	D	0.87	46.6	D	0.91	50.3	D	0.93
SW Wilsonville Road/SW Boones Ferry Road	LOS D	38.5	D	0.79	51.3	D	0.91	53.4	D	0.92
SW Wilsonville Road/I-5 Southbound Ramp	LOS D and 0.90 v/c[a]	23.4	C	0.52	23.7	C	0.56	23.9	C	0.57
I-5 Southbound On-Ramp Meter	N/A	-	-	0.92	-	-	0.98	-	-	0.99

Delay = Average Intersection Delay (sec.) v/c = Volume-to-Capacity Ratio LOS = Level of Service

[a]The typical ODOT mobility target for interchange ramps is a 0.85 v/c ratio. However, when the interchange vicinity is fully developed and adequate storage is available on the interchange ramp to prevent queues from backing up on the main line, then the target can be increased to a 0.90 v/c ratio. This is the case for the both I-5 interchange areas in Wilsonville.

Even though the SW Wilsonville Road/Southbound I-5 intersection does meet the 0.90 v/c mobility target for both Phase 1 and Phase 2, the southbound on-ramp signal meter is expected to experience an increase in future demand volumes during the peak hour. The on-ramp meter has a capacity of 1,260 vehicles per hour. These future demand projections would result in the ramp meter experiencing volume-to-capacity ratio of 0.99 by the completion of Phase 2.

Site Plan Evaluation

A site plan showing the proposed development can be found in the appendix. The site plan shows sufficient space for two way motor vehicle circulation except for trucks attempting to reach the proposed loading dock at the south side of the high tech building. Turn radius does not appear to be sufficient for trucks to arrive and depart from the loading dock based on a preliminary evaluation of the site plan provided. It is recommended that the project sponsor provide turn templates showing safe circulation to the loading dock or the project site should be reconfigured to accommodate truck turning movements.

The existing site accesses to the proposed DW Fritz site include two driveways along Boeckman Road. The east driveway provides access to the parking lots on the east side of the existing building. The west driveway connects to parking lots on the west side of the existing building and provides access to the proposed high tech building and restaurant.

City Code Requirement

The proposed 70,000 square-foot manufacturing building and 4,000 square-foot restaurant is required to comply with the City of Wilsonville Planning and Land Development code for the number of vehicular parking stalls and bicycle parking spaces that are provided on site.[4] Table 8 lists the vehicular and bicycle parking requirements for both the proposed building and the entire site, which are based on the types and square footage of the various building uses. The table also lists the peak parking demand, which is estimated based on parking data published by the Institute of Transportation Engineers (ITE).[5]

Table 8: Vehicular and Bicycle Parking Summary

Land Use (ITE Code)	Size (KSF[a])	Estimated Peak Demand[b]	Spaces Required by City Code[c]		
			Vehicle Minimum	*Vehicle Maximum*	*Bicycle Minimum*
New Building					
Manufacturing (Land Use 140)	70	83	112	No limit	7
Restaurant (Land Use 932)	4	65	61	92	4
Total New Building	**74**	**148**	**173**	**No limit**	**11**
Existing Building					
Manufacturing (Land Use 140)	155	183	248	No limit	16
Total Existing Building	**155**	**183**	**248**	**No limit**	**16**
TOTAL SITE	**229**	**331**	**421**	**No limit**	**27**

[a] KSF = 1,000 square feet

[b] Estimated demand based on 85th percentile identified in the *Parking Generation, 4th Edition*, Institute of Transportation Engineers, 2010.

[c] City of Wilsonville, Planning and Land Development Ordinance, Section 4.155, Table 5, Updated June 2013.

As shown in Table 8, 173 vehicular stalls are needed to meet the minimum City Code requirements for the new building and 148 stalls are needed to satisfy the estimated peak parking demand. For the entire site, 421 vehicular stalls are needed to meet the minimum City Code requirements and 331 stalls are needed to satisfy the estimated peak parking demand. Because the site is expected to have 529 parking stalls, the site is expected to have sufficient available parking. The table above also indicates that 27 bicycle parking spaces are needed at the project site to meet the minimum City Code requirements. Currently, the site plan does not show any bicycle parking spaces. At minimum, 27 bicycle parking spaces will need to be built on the project site and should be located near building entrances in order to provide convenient access.

Access Spacing and Sight Distance

The two existing driveways along Boeckman Road are spaced at approximately 460 feet from 95th Avenue, approximately 400 feet apart from each other, and approximately 560 feet from Kinsman and do not conform with the City's minimum access spacing standards (600 feet) in

[4] City of Wilsonville, Planning and Land Development Ordinance, Sections 4.154-4.198, Updated Feb. 2004.

[5] *Parking Generation*, 4rd Edition, Institute of Transportation Engineers, 2010.

the TSP[6] for a minor arterial. The existing accesses will require a variance to the City's access spacing standards.

Preliminary sight distance was evaluated at the existing site driveways on Boeckman Road and there were no concerns. Prior to occupancy, sight distance at any existing access points will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon to assure that buildings, signs or landscaping does not restrict sight distance.

Project Impact Summary

The DW Fritz development is anticipated to result in the following impacts:

Trip Generation

- The development is expected to be completed in two phases; Phase 1 includes a 155,000 square foot renovation to a currently vacant warehouse. Phase 2 includes the addition of a 70,000 square foot high tech building and a 4,000 square foot restaurant.
- Phase 1 of the development is expected to generate an additional 105 (38 in, 67 out) PM peak hour trips and Phases 1 and Phase 2 of the development is expected to generate an additional 164 (64 in, 100 out) net new PM peak hour trips.
- Of the 105 total Phase 1 project trips, 32 new PM peak hour trips are estimated to pass through the I-5/SW Elligsen Road interchange area and 21 PM peak hour trips through the I-5/Wilsonville Road interchange area.
- Of the 164 total Phase 1 and Phase 2 project trips, 49 new PM peak hour trips are estimated to pass through the I-5/SW Elligsen Road interchange area and 33 PM peak hour trips through the I-5/Wilsonville Road interchange area.

Intersection Operations

- All the study intersections meet the City's operating standard and ODOT mobility targets for all scenarios.

Site Plan Evaluation

- Turn radius does not appear to be sufficient for trucks to arrive and depart from the loading dock based on a preliminary evaluation of the site plan provided. It is recommended that the project sponsor provide turn templates showing safe circulation to the loading dock or the project site should be reconfigured to accommodate truck turning movements.

[6] City of Wilsonville Transportation System Plan, Table 3-2, Amended June 2016.

- The City Code requirement for vehicular parking is 421 parking stalls at the project site and the parking demand is estimated at 331 parking stalls. The site plan proposes 529 stalls, meeting the city code requirement and parking demand. The minimum bicycle parking stall requirement per City Code is 27 stalls. The site plan does not currently show any bicycle parking stalls.

Access Spacing and Sight Distance

- The driveways along Boeckman Road do not conform with the current minimum access spacing standards (600 feet) in the TSP for a minor arterial. The existing accesses will require a variance to the City's access spacing standards.
- Prior to occupancy, sight distance at any existing access points will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon to assure that buildings, signs or landscaping does not restrict sight distance.

CHAPTER 2: EXISTING CONDITIONS

This chapter provides documentation of existing study area conditions, including the study area roadway network, pedestrian and bicycle facilities, and existing traffic volumes and operations. Supporting details are provided in the appendix.

Project Site

The project sponsor plans to renovate the currently vacant manufacturing building (155,000 square feet) as part of Phase 1. A new high tech building (70,000 square feet) and restaurant (4,000 square feet) will be completed in Phase 2. The renovated manufacturing building and high tech building both include a combination of office space and warehouse space.

Study Area Roadway Network

Key roadways in the study area are summarized in Table 9 along with their existing (or proposed) roadway characteristics. The functional classifications for City of Wilsonville streets are provided in the *City of Wilsonville Transportation System Plan* (TSP).[7]

Table 9: Study Area Roadway Characteristics (within the Study Area)

Roadway	Classification	No. of Lanes	Posted Speed	Sidewalks	Bike Lanes	On-Street Parking
SW Elligsen Road	Major Arterial	4	35 mph	Yes	Yes	No
Boeckman Road	Minor Arterial	2	40 mph	Yes/No[a]	Yes	No
SW Parkway Avenue	Minor Arterial	3	45 mph	Yes/No[b]	Yes/No[b]	No
SW 95th Avenue	Minor Arterial	3	35 mph	Yes/No[c]	Yes	No
SW Wilsonville Road	Major Arterial	4	25 - 35 mph	Yes	Yes	No
SW Boones Ferry Road (Day Rd to I-5 SB Ramp)	Major Arterial	3-5	35 mph	Yes/No[d]	Yes	No
SW Boones Ferry Road (south of Ridder Rd)	Collector	2-3	35 mph	Partial	Partial	No

[a] No sidewalk between Parkway Ave and Boberg Rd
[b] Sidewalk and bike lane missing along segments of SW Parkway Ave
[c] No sidewalk on the west side between Boeckman Road and SW Hillman Ct
[d] No sidewalk on the west side

[7] *Wilsonville Transportation System Plan*, Adopted by Council, June 2013.

Pedestrian and Bicycle Facilities

Near the project site, Boeckman Road meets the City's standards for minor arterial and is improved with curbs, gutters, sidewalks and bike lanes on both sides of the street. The Kinsman Road extension that is currently under construction will run along the west side of the project site and is expected to have standard bike lanes and sidewalks once completed.

Public Transit Service

South Metro Area Regional Transit (SMART) operates several fixed routes that serve Wilsonville and the surrounding area.[8] Route 5 travels on Boeckman Road, SW 95th Avenue, and SW Boones Ferry Road and provides service between the SMART Central station in Wilsonville to SW Pioneer Court in Wilsonville. There are two stops along Route 5 that are located on SW 95th Avenue. Route 2X provides service from the SMART Central station in Wilsonville to Barbur Station in Portland. This route travels on SW Boones Ferry Road, SW Wilsonville Road, Parkway Avenue, and SW Elligsen Road. There are two stops located near SW Parkway Avenue/Boeckman Road intersection on Route 2X. At the SW Wilsonville Road/SW Boones Ferry Road intersection, many SMART transit stops are located as the SMART transit station is located half a mile north of the intersection.

The Kinsman Road extension will include transit route and stop improvements when it is complete (it is currently under construction).

Future Planned Projects

Funded Projects

The following is a list of planned and funded projects included in the Wilsonville TSP[9]. Both of these projects are currently under design. A map of these improvements can be seen in the appendix.

- **RW-P2 Additional Queuing Lane on Southbound I-5 Ramp:** Construct a third queuing lane on the southbound I-5 ramp at the I-5/Wilsonville Road interchange.
- **RE-08 Kinsman Road Extension (South):** Construct 2-lane roadway with bike lanes, sidewalks, and transit stop improvements from Barber Street to Boeckman Road; project also includes a roundabout at Kinsman Road/Boeckman Road intersection

[8] South Metro Area Regional Transit (SMART) operates several fixed routes that serve Wilsonville and make connections to TriMet in Portland, Cherriots in Salem, and Canby Area Transit. The City's transit center, "SMART Central at Wilsonville Station," provides connections to all SMART routes and to TriMet's Westside Express Service (WES) commuter rail station.

[9] *Wilsonville Transportation System Plan*, Adopted by Council, June 2013.

Unfunded Projects

The following is a list of planned but unfunded projects included in the Wilsonville TSP. A map of these improvements can be seen in the appendix.

- **BW-02 95th Avenue Sidewalk Infill:** Fill in the sidewalk network on the east side of 95th Avenue from Boeckman Road to Hillman Court, and construct transit stop improvements.
- **RW-01 Boeckman Road Bridge and Corridor Improvements:** Widen Boeckman Road from Boberg Road to 500 feet east of Parkway Avenue to include additional travel lanes in both directions along with bike lanes and sidewalks; project includes reconstruction of the bridge over I-5 and improvements at Boeckman Road/Boberg Road and Boeckman Road/Parkway Avenue intersections and adjacent transit stops.

Existing Traffic Volumes and Operations

Existing PM peak hour traffic operations were analyzed at the following study intersections based on coordination with city staff[10]:

- SW Boones Ferry Road/SW 95th Avenue
- SW Elligsen Road/ I-5 Southbound Ramp
- Boeckman Road/95th Avenue
- Boeckman Road/SW Parkway Avenue
- SW Wilsonville Road/SW Boones Ferry Road
- SW Wilsonville Road/I-5 Southbound Ramp

The counted volumes at these intersections were collected[11] during the PM peak hour when schools were in session. The volumes are shown in Figure 2. The following sections describe intersection performance measures, required operating standards, existing operating conditions, and field observations.

Intersection Performance Measures

Level of service (LOS) ratings and volume-to-capacity (v/c) ratios are two commonly used performance measures that provide a good picture of intersection operations.

- **Level of service (LOS):** A "report card" rating (A through F) based on the average delay experienced by vehicles at the intersection.[12] LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D

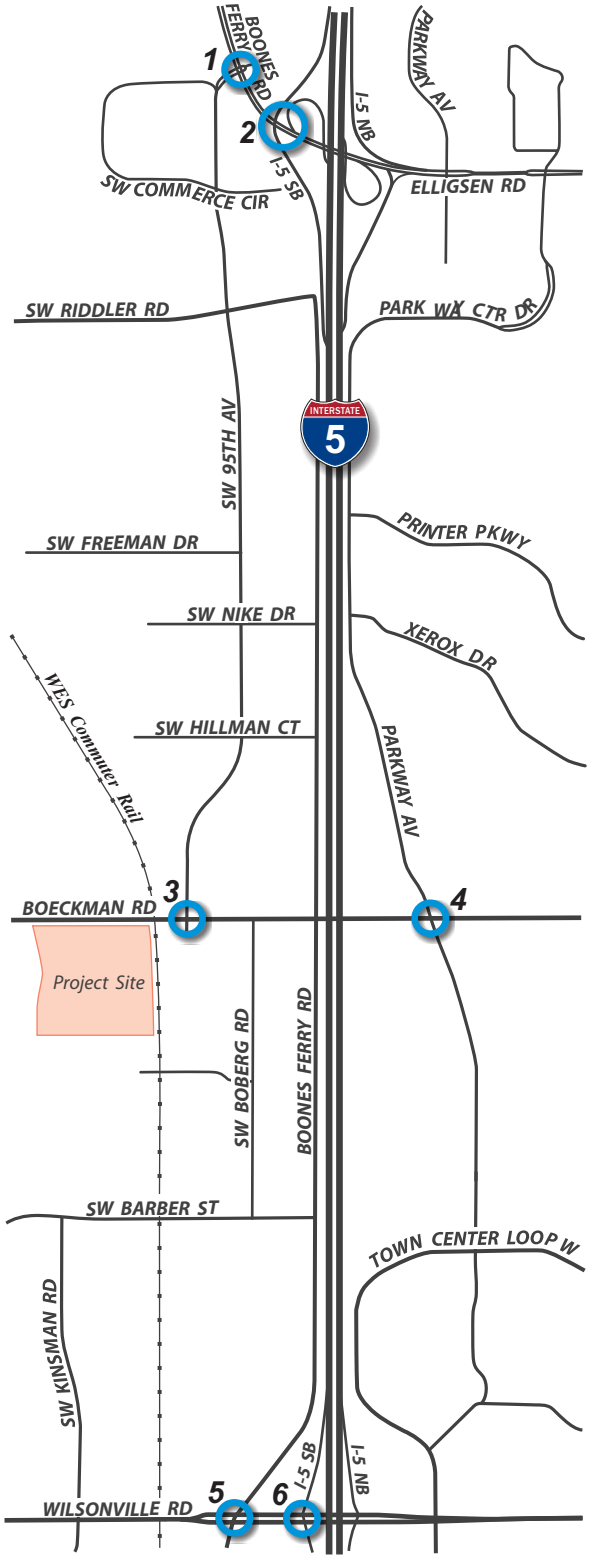
[10] Phone conversation with Steve Adams, City of Wilsonville, March 29th, 2017.

[11] Traffic data was collected on June 7th, 2017 by All Traffic Data.

[12] A description of Level of Service (LOS) is provided in the appendix and includes a list of the delay values (in seconds) that correspond to each LOS designation.

and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity.

- **Volume-to-capacity (v/c) ratio:** A decimal representation (typically between 0.00 and 1.00) of the proportion of capacity that is being used at a turn movement, approach leg, or intersection. It is determined by dividing the peak hour traffic volume by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 1.00, congestion increases and performance is reduced. If the ratio is greater than 1.00, the turn movement, approach leg, or intersection is oversaturated and usually results in excessive queues and long delays.



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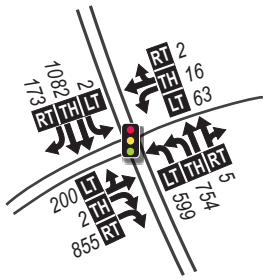
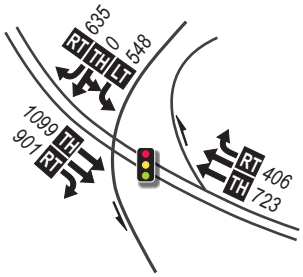
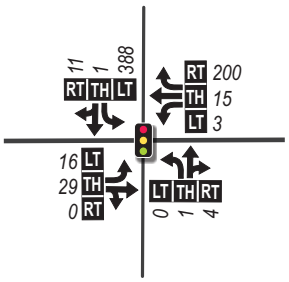


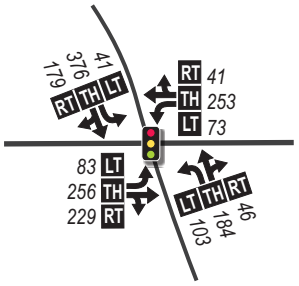
2. I-5 SB @ Elligsen Rd. / Boones Ferry Rd.



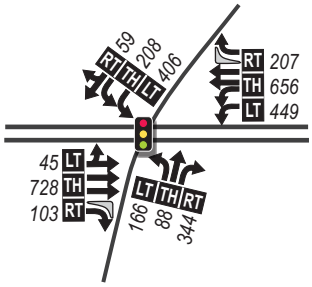
3. Boeckman Rd. @ SW 95th Ave.



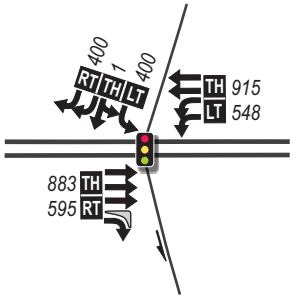
4. Boeckman Rd. @ SW Parkway Ave.



5. SW Boones Ferry Rd. @ SW Wilsonville Rd.



6. SW Wilsonville Rd. @ I-5 Southbound Ramp



LEGEND

- # - Study Intersection
- Traffic Signal
- STOP - Stop Sign
- Lane Configuration
- *000* - PM Peak Hour Traffic Volumes
- LT TH RT (Left•Thru•Right) - Volume Turn Movement

DKS

No Scale

Figure **2**

2017 Existing Conditions PM Peak Hour Traffic Volumes

Required Operating Standards

The City of Wilsonville requires the study intersection of public streets to meet its minimum acceptable level of service (LOS) standard, which is LOS D for peak periods.[13] The typical ODOT mobility target for interchange ramps is a 0.85 v/c ratio.[14]

However, when the interchange vicinity is fully developed and adequate storage is available on the interchange ramp to prevent queues from backing up on the main line, then the target can be increased to a 0.90 v/c ratio. This is the case for the both I-5 interchange areas in Wilsonville. While private driveway approaches are not required by City code to meet the City's LOS standard, the safety and operations of these driveways are still considered.

Existing Operating Conditions

Existing traffic operations at the study intersection were determined for the PM peak hour based on the 2000 Highway Capacity Manual methodology for signalized intersection.[15] The results were then compared with the City of Wilsonville's minimum acceptable level of service (LOS) operating standard of LOS D or better and the ODOT Mobility Target of v/c ratio of 0.90 or better. Table 10 lists the estimated delay, LOS, and v/c ratio of each study intersection. The existing study intersections currently meet mobility targets and operating standards.

Table 10: Existing PM Peak Study Intersection Operations

Intersection	Mobility Targets/ Operating Standard	Existing PM Peak		
		Delay	*LOS*	*v/c*
SW Boones Ferry Road/SW 95th Avenue	LOS D	25.5	C	0.77
SW Elligsen Road/I-5 Southbound Ramp	LOS D and 0.90 v/c[a]	17.7	B	0.79
Boeckman Road/SW 95th Avenue	LOS D	17.2	B	0.44
Boeckman Road/SW Parkway Avenue	LOS D	37.0	D	0.85
SW Wilsonville Road/SW Boones Ferry Road	LOS D	38.3	D	0.78
SW Wilsonville Road/I-5 Southbound Ramp	LOS D and 0.90 v/c[a]	23.6	C	0.52
I-5 Southbound On-Ramp Meter	N/A	-	-	0.91

Delay = Average Intersection Delay (sec.) LOS = Level of Service v/c = Volume-to-Capacity Ratio

[a]The typical ODOT mobility target for interchange ramps is a 0.85 v/c ratio. However, when the interchange vicinity is fully developed and adequate storage is available on the interchange ramp to prevent queues from backing up on the main line, then the target can be increased to a 0.90 v/c ratio. This is the case for the both I-5 interchange areas in Wilsonville.

It is important to note that the intersection operations at the study intersections shown in Table 2 represent typical operations. What this analysis does not include is incurred delay from incidents

[13] *City of Wilsonville Code*, City of Wilsonville Section 4.140, p.163.

[14] Table 6, Page 84, 1999 Oregon Highway Plan, Oregon Department of Transportation, Amended May 2015.

[15] *2000 & 2010 Highway Capacity Manual*, Transportation Research Board, Washington DC, 2000/2010.

on the I-5 mainline and the ramp meter on the I-5 southbound ramp at Wilsonville Road that regulates the flow of traffic onto I-5.

The existing capacity of this ramp meter is 1,260 vehicles per hour. If the peak hour demand of the southbound on-ramp exceeds 1,260 vehicles, additional storage would be necessary to prevent spillback and associated impacts on SW Wilsonville Road.

Currently, approximately 1,144 vehicles are entering the southbound on-ramp during the peak hour which results in a volume to capacity (v/c) ratio of 0.91 which is nearing the ramp's full capacity. When traffic incidents occur on I-5 and I-205 such that the additional traffic exceeds the 1,260 vehicles or the I-5 mainline cannot deliver the existing traffic flow, the I-5/SW Wilsonville Road interchange is significantly impacted and vehicles experience traffic delays similar to level of service "F" (greater than 80 seconds of delay).

Field Observations

DKS observed the DW Fritz Renovation project area and the study intersections during the PM peak hour on a typical weekday to identify unique aspect of the project area and the study intersection operations. Observations were also taken to verify that actual intersection operations were consistent with the analysis results.[16] Notable observations included:

Project Site and Driveways

- No sight distance issues were observed at either of the existing project site driveways.
- Boeckman Road in front of the project site was temporarily closed to through traffic due to construction on the Kinsman Road extension (see photo below, left).

Boeckman Road closed in front of project site due to construction (left) and queues on the southbound approach at Boeckman Road/SW Parkway Avenue

[16] Field visit conducted on Thursday, July 13, 2017.

SW Boones Ferry Road/SW 95th Avenue

- Queues on the southbound approach reached as far back as the Day Rd intersection (see photo below, left) and queues on the northbound approach spilled back to the I-5 southbound off-ramp intersection (see photo below, right)

Queues at SW Boones Ferry Road/SW 95th Avenue southbound approach (left) and queues on the northbound approach (right)

Boeckman Road/SW Parkway Avenue

Approximately eleven vehicles were observed to be queuing during PM peak hour (see photo above, right) in both the southbound and eastbound directions.

- Eastbound vehicles were seen taking short gaps on right-turns-on-red.

SW ElligsenRoad/I-5 Southbound Ramp

- Queues on the I-5 southbound on-ramp backed up onto Elligsen Road just past the ramp intersection. There is currently no ramp meter at this location.

Queues at SW Elligsen Road/I-5 Southbound Ramp

SW Wilsonville Road/I-5 Southbound Ramp and SW Wilsonville Road/SW Boones Ferry Road

- Queues on the I-5 southbound on-ramp reached capacity during the PM peak hour and backed up to Wilsonville Road (see two photos below)
- Queues on Wilsonville Road from the I-5 southbound ramp prevent northbound right turns and southbound left turns at SW Wilsonville Road/SW Boones Ferry Road intersection from entering the intersection during peak hours.

Looking east at the SW Wilsonville Road/I-5 southbound on-ramp intersection. Vehicle can be seen in intersection when cross traffic has green light.

CHAPTER 3: PROJECT IMPACTS

This chapter reviews the impacts that the proposed DW Fritz development may have on the study area transportation system. This analysis includes site plan evaluation, trip generation, trip distribution, and future year traffic volumes and operating conditions. The focus of the impact analysis is on the following study intersection identified by City of Wilsonville staff:

- SW Boones Ferry Road/SW 95th Avenue
- SW Elligsen Road/ I-5 Southbound Ramp
- Boeckman Road/95th Avenue
- Boeckman Road/SW Parkway Avenue
- SW Wilsonville Road/SW Boones Ferry Road
- SW Wilsonville Road/I-5 Southbound Ramp

Proposed Development

The proposed development involves renovating and occupying the existing 155,000 square foot industrial building. In addition, there will be a new 70,000 square foot high tech building and a 4,000 square foot sit-down restaurant. This development will have two existing driveways along Boeckman Road.

Trip Generation

Trip generation is the method used to estimate the number of vehicles added to site driveways and the adjacent roadway network by a development during a specified period (i.e., such as the PM peak hour). For this study, typical ITE trip generation data was used which is based on national land use data.[17]

Table 11 provides the trip generation for the proposed office and warehousing space renovation (Phase 1). The Phase 1 development is expected to generate approximately 105 total (38 in, 67 out) PM peak hour trips.

Table 11: PM Peak Hour Primary Trip Generation Phase 1

Phase	Land Use (ITE Code)	Building area (square feet)	Trip Rate per 1,000 square feet	In	Out	Total
1	Manufacturing (140)	155,000	0.68[a]	38	67	**105**
			Phase 1 Total Primary Trips	38	67	**105**

[a]Rate back-calculated from ITE equation

[17] Intersection turning movements counts were collected on Tuesday, January 24, 2017. Additionally 24-hour bi-directional counts were collected on Tuesday thru Thursday, February 21, 22, and 23, 2017. Data was collected by All Traffic Data.

Table 12 provides the trip generation for both the renovated building and the additions of the high tech building and restaurant (Phase 2). It should be noted that the Phase 2 ITE equation trip generation associated with the manufacturing land use is lower than what was assumed in Phase 1. The ITE data has a trip rate that decreases as the total square footage increases. The proposed Phase 1 and Phase 2 development is expected to generate approximately 183 (75 in, 108 out) PM peak hour primary trips.

Table 12: PM Peak Hour Primary Trip Generation Phases 1 & 2

Phase	Land Use (ITE Code)	Building area (square feet)	Trip Rate per 1,000 square feet	In	Out	Total
1 and 2	Manufacturing (140)	155,000 + 70,000	0.64[a]	52	44	**144**
2	Restaurant (932)	4,000	9.85	23	16	**39**
		Phases 1 & 2 Total Primary Trips		75	108	**183**

[a]Rate back-calculated from ITE equation

As per ITE guidance,[18] two reductions in primary trips were included in the trip generation analysis; internal trips and pass-by trips. The following paragraphs discuss these reductions and Table 13 displays the total net new trips after accounting for the internal and pass-by trip reductions.

Internal Trips. A reduction of internal trips was evaluated to reduce the total number of driveway trips to account for trips between uses (for example employees from the industrial uses staying to eat at the restaurant). An internal capture rate of 10% was applied to the PM peak hour primary trips of the restaurant. Internal trip reductions are shown in Table 13.

Pass-By Trips. A reduction of pass-by trips was evaluated for the proposed sit down restaurant to account for traffic that currently exists on the adjacent roadways that the proposed project will have primary access. Pass-by trips are subtracted out after the internal trips are applied and for this project, were only applied to the restaurant trip generation. Pass-by rate of 43% was taken from the ITE Trip Generation Handbook.[19] Pass-by trips result in new driveway trips only and will not increase traffic to the adjacent roadways. Table 13 shows the reduction in primary trips due to pass-by trips for the sit down restaurant.

[18] Institute of Transportation Engineers, Trip Generation Handbook, October 1998.
[19] Institute of Transportation Engineers, Trip Generation Handbook, October 1998. Table F.30, Land Use Code 932.

Table 13: PM Peak Hour Net New Trips

	In	Out	Total
Total Primary Trips (Phases 1 and 2)	75	108	**183**
Internal Trip Reduction (10% of restaurant trips)	-2	-2	**-4**
Pass-By Trip Reduction (43% of restaurant trips)	-9	-6	**-15**
Net New Trips (Phase 1 and Phase 2)	64	100	**164**

After reducing the primary project restaurant trips in Phase 2 by the internal trip reduction of 10% and then the pass-by trips for the restaurant (43%), the net new total trips to the project site is 164 (64 in/ 100 out) during the PM peak hour.

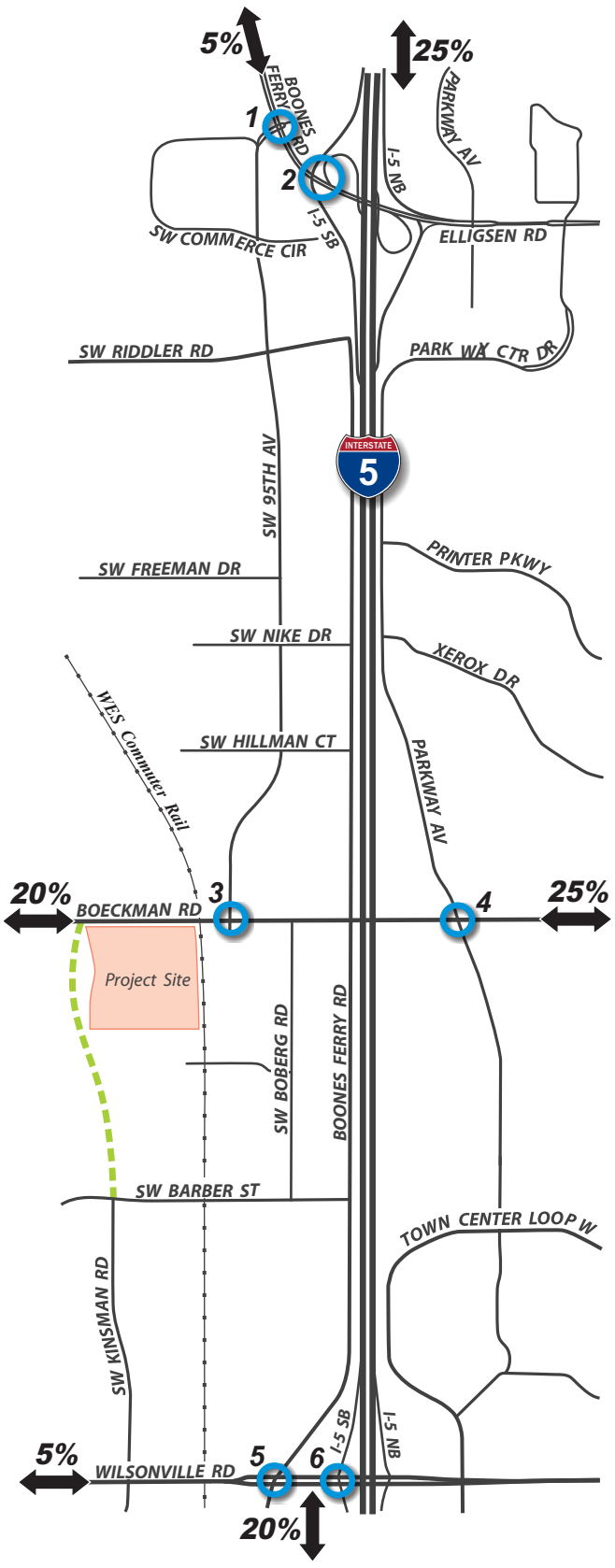
Trip Distribution

Trip distribution provides an estimate of where project-related trips would be coming from and going to. It is given as percentages at key gateways to the study area and is used to route project trips through the study intersections. Figure 3 shows the expected trip distribution and project trip routing for the additional traffic generated by the DW Fritz project. The trip distribution was estimated using the City of Wilsonville travel demand model.[20] The RE-08 Kinsman Road Extension (South) project is expected to be completed prior to the completion of the DW Fritz project. Therefore, project trips are shown to use this route in the trip distribution applied.

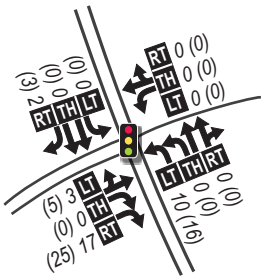
Project Trips Through City of Wilsonville Interchange Areas

The project trips through the two City of Wilsonville I-5 interchange areas were estimated based on the trip generation and distribution assumptions. The proposed DW Fritz development is expected to generate 32 PM peak hour trips for Phase 1 and a total of 49 PM peak hour trips for Phases 1& 2 through the I-5/SW Elligsen Road interchange area. The development is expected to generated 21 PM peak hour trips for Phase 1 and 33 PM peak hour trips for Phases 1 & 2 through the I-5/Wilsonville Road interchange area.

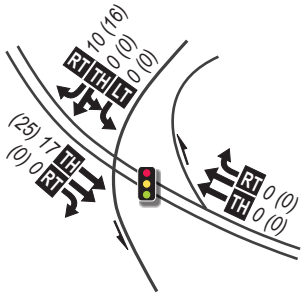
[20] *Wilsonville Travel Forecast Model, Select zone model run for DW Fritz Traffic Analysis Zone.*



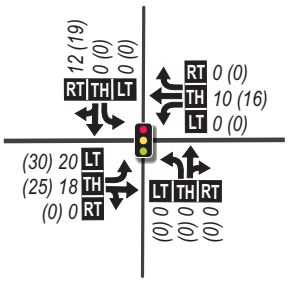
1. SW Boones Ferry Rd. @ SW 95th Ave.



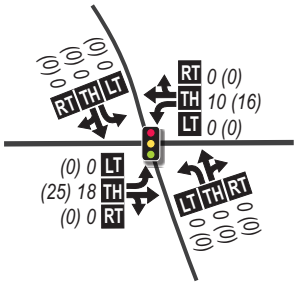
2. I-5 SB @ Elligsen Rd. / Boones Ferry Rd.



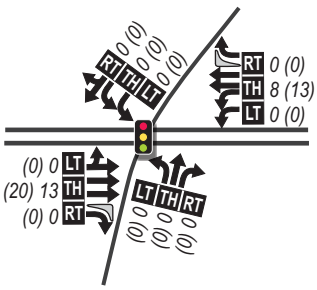
3. Boeckman Rd. @ SW 95th Ave.



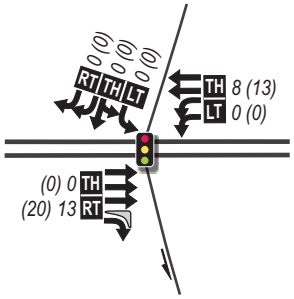
4. Boeckman Rd. @ SW Parkway Ave.



5. SW Boones Ferry Rd. @ SW Wilsonville Rd.



6. SW Wilsonville Rd. @ I-5 Southbound Ramp



LEGEND

- # - Study Intersection
- Traffic Signal
- Planned Connection
- STOP - Stop Sign
- Lane Configuration
- 000 (000) - Phase 1 (Phases 1 & 2) PM Peak Hour Traffic Volumes
- LT TH RT (Left • Thru • Right) - Volume Turn Movement
- 00% - Trip Distribution Percentage

DKS

No Scale

Figure **3**

Trip Distribution & Project Trips PM Peak Hour Traffic Volumes

Future Traffic Volumes and Operating Conditions

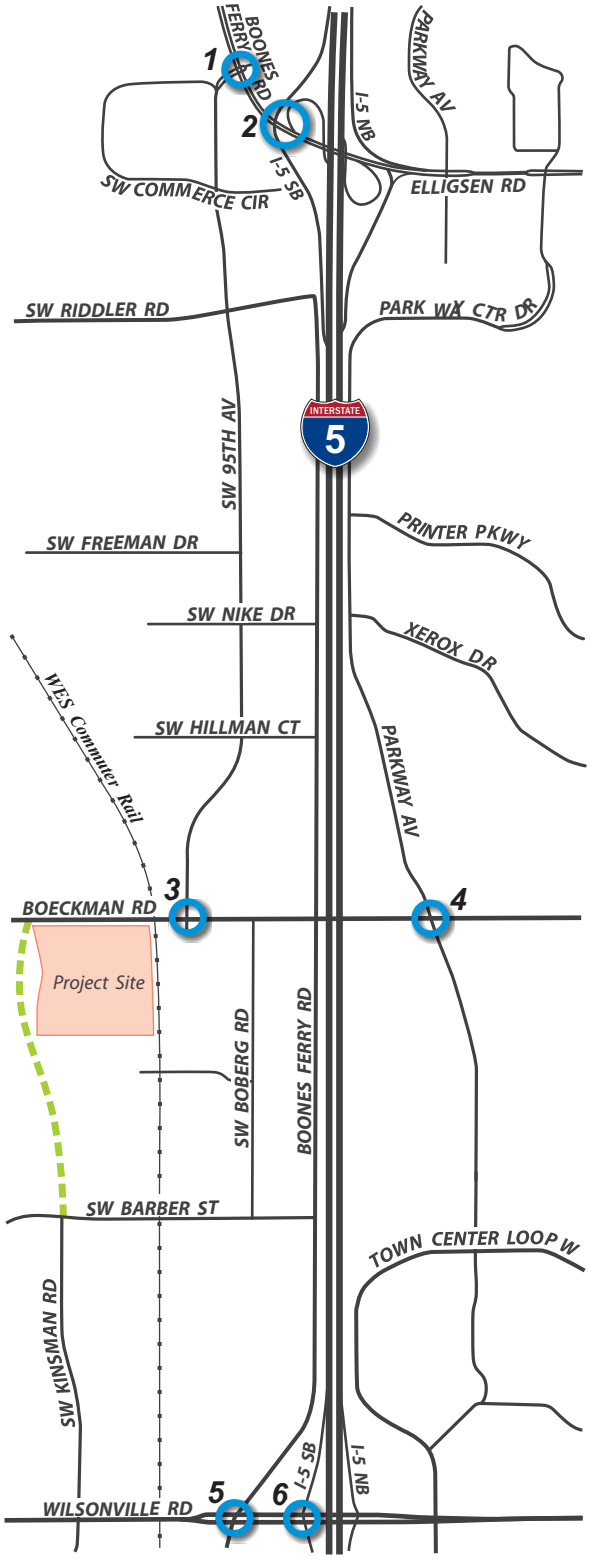
The proposed DW Fritz renovation includes a combination of office, manufacturing, and restaurant space which will be completed in two phases. The first phase involves renovating the existing 155,000 square foot office and warehouse building. The second phase will add a new 70,000 square foot high tech building and a new 4,000 square foot sit-down restaurant to the project site. Future operating conditions were analyzed at the study intersections for the following future traffic scenarios. The comparison of the following scenarios enables the assessment of project impacts:

- Existing + Stage II (includes traffic from other developments with Stage II approval or are under construction)
- Existing + Project Phase 1
- Existing + Project Phase 1 + Stage II
- Existing + Project (Phase 1 and Phase 2)
- Existing + Project (Phase 1 and Phase 2) + Stage II

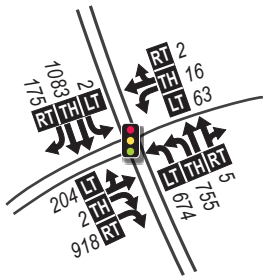
Future traffic volumes were estimated at the study intersection for each scenario. The future operating scenarios include various combinations of three types of traffic: existing, project, and Stage II. Stage II development trips are estimated based on the list of currently approved Stage II developments provided by City staff.[21] The Stage II list and the corresponding PM peak hour trip generation estimates for these developments are included in the appendix.

Figure 4 show the PM peak hour traffic volumes used to analyze the "Existing plus Stage II" scenario. Figure 5 and Figure 6 show the PM peak hour traffic volumes used to analyze the "Existing plus Project" and "Existing plus Project plus Stage II" scenarios for each project phase.

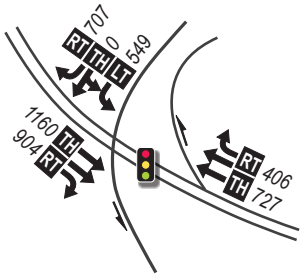
[21] Email from Daniel Pauly, City of Wilsonville, June 16, 2017 (see appendix for Stage II list).



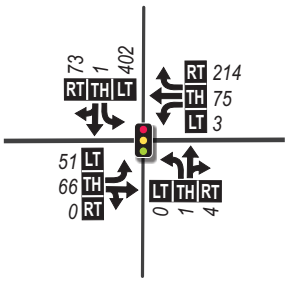
1. SW Boones Ferry Rd. @ SW 95th Ave.



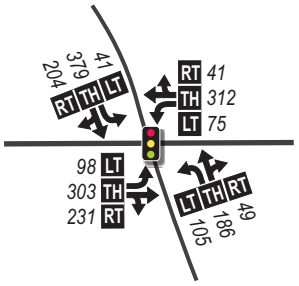
2. I-5 SB @ Elligsen Rd. / Boones Ferry Rd.



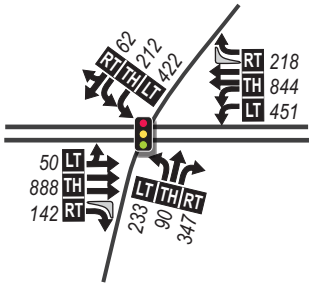
3. Boeckman Rd. @ SW 95th Ave.



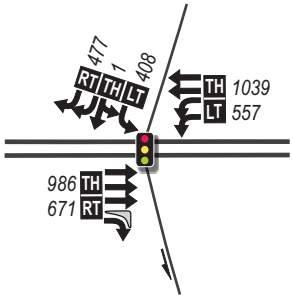
4. Boeckman Rd. @ SW Parkway Ave.



5. SW Boones Ferry Rd. @ SW Wilsonville Rd.



6. SW Wilsonville Rd. @ I-5 Southbound Ramp



LEGEND

- # - Study Intersection
- Traffic Signal
- Planned Connection
- STOP - Stop Sign
- Lane Configuration
- *000* - PM Peak Hour Traffic Volumes
- LT TH RT (Left•Thru•Right) - Volume Turn Movement

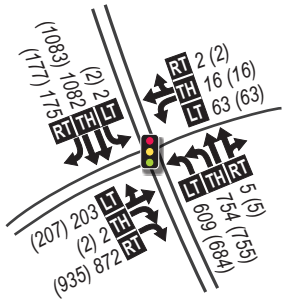
DKS

No Scale

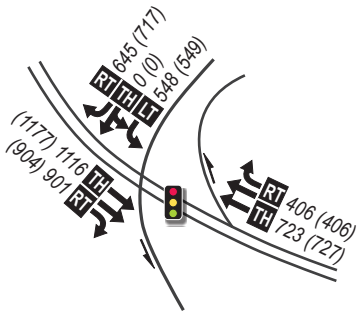
Figure 4

2017 Existing Conditions + Stage II PM Peak Hour Traffic Volumes

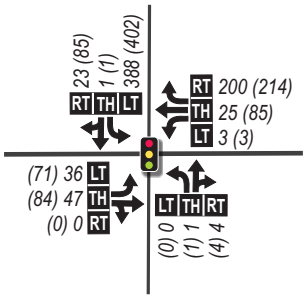
1. SW Boones Ferry Rd. @ SW 95th Ave.



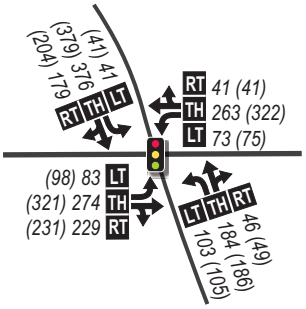
2. I-5 SB @ Elligsen Rd. / Boones Ferry Rd.



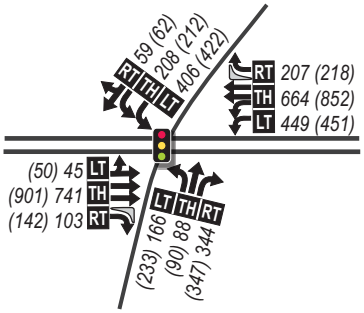
3. Boeckman Rd. @ SW 95th Ave.



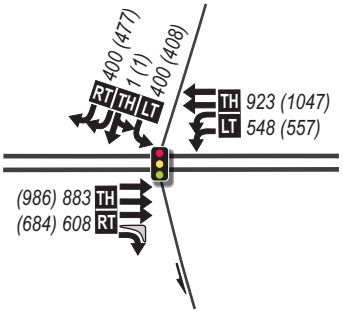
4. Boeckman Rd. @ SW Parkway Ave.



5. SW Boones Ferry Rd. @ SW Wilsonville Rd.



6. SW Wilsonville Rd. @ I-5 Southbound Ramp



LEGEND

- # - Study Intersection
- Traffic Signal
- Planned Connection
- STOP - Stop Sign
- Lane Configuration
- *000 (000)* - Existing + Phase 1 (Existing + Phase 1 + Stage II) PM Peak Hour Traffic Volumes
- LT TH RT - Volume Turn Movement (Left•Thru•Right)

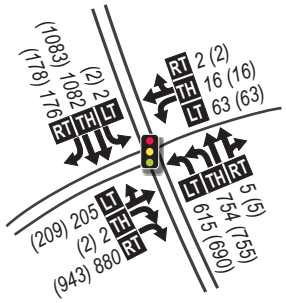
DKS

No Scale

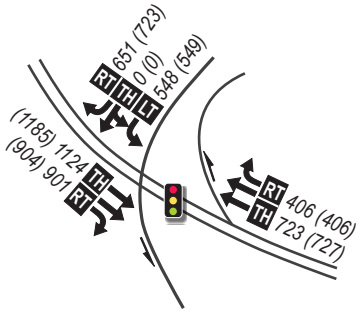
Figure 5

Existing + Project Phase 1 PM Peak Hour Traffic Volumes

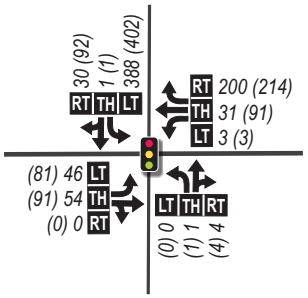
1. SW Boones Ferry Rd. @ SW 95th Ave.



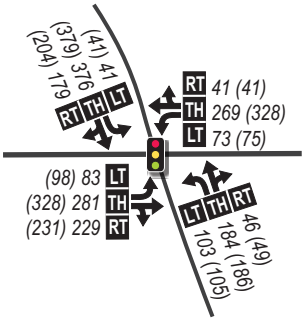
2. I-5 SB @ Elligsen Rd. / Boones Ferry Rd.



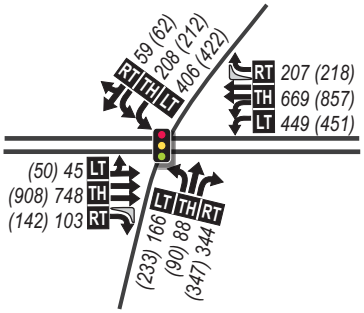
3. Boeckman Rd. @ SW 95th Ave.



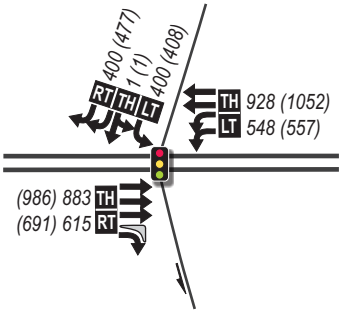
4. Boeckman Rd. @ SW Parkway Ave.



5. SW Boones Ferry Rd. @ SW Wilsonville Rd.



6. SW Wilsonville Rd. @ I-5 Southbound Ramp



LEGEND

- # - Study Intersection
- Traffic Signal
- Planned Connection
- STOP - Stop Sign
- Lane Configuration
- 000 (000) - Existing + Phases 1 & 2 (Existing + Phases 1 & 2 + Stage II) PM Peak Hour Traffic Volumes
- LT TH RT (Left•Thru•Right) - Volume Turn Movement

DKS

No Scale

Figure 6

Existing + Project Phases 1 & 2 PM Peak Hour Traffic Volumes

Intersection Operations

The study intersection operating conditions for the project trips during Phase 1 development and future Stage II developments are listed in Table 14. All the study intersections meet operating standards for "Existing plus Phase 1," "Existing plus Stage II," and "Existing plus Project (Phase 1) plus Stage II" scenarios.

Table 14: Future Project (Phase 1) and Stage II Intersection Operations Comparison

Intersection	Mobility Target/ Operating Standard	Existing + Phase 1			Existing + Stage II			Existing + Phase 1 + Stage II		
		Delay	*LOS*	*v/c*	*Delay*	*LOS*	*v/c*	*Delay*	*LOS*	*v/c*
SW Boones Ferry Road/SW 95th Avenue	LOS D	25.7	C	0.77	26.6	C	0.80	26.9	C	0.80
SW Elligsen Road/I-5 Southbound Ramp	LOS D and 0.90 v/c[a]	17.8	B	0.80	20.1	C	0.87	21.0	C	0.88
Boeckman Road/SW 95th Avenue	LOS D	18.7	B	0.45	19.3	B	0.49	20.5	C	0.51
Boeckman Road/SW Parkway Avenue	LOS D	38.9	D	0.87	46.6	D	0.91	49.3	D	0.93
SW Wilsonville Road/SW Boones Ferry Road	LOS D	38.4	D	0.79	51.3	D	0.91	52.7	D	0.92
SW Wilsonville Road/I-5 Southbound Ramp	LOS D and 0.90 v/c[a]	23.5	C	0.52	23.7	C	0.56	23.8	C	0.56
I-5 Southbound On-Ramp Meter	N/A	-	-	0.92	-	-	0.98	-	-	0.99

Delay = Average Intersection Delay (sec.) v/c = Volume-to-Capacity Ratio LOS = Level of Service

[a]The typical ODOT mobility target for interchange ramps is a 0.85 v/c ratio. However, when the interchange vicinity is fully developed and adequate storage is available on the interchange ramp to prevent queues from backing up on the main line, then the target can be increased to a 0.90 v/c ratio. This is the case for the both I-5 interchange areas in Wilsonville.

The study intersection operating conditions for the project trips during Phases 1 and 2 development and future Stage II developments are listed in Table 15. Again, all the study intersections meet operating standards for "Existing plus Phases 1 & 2," "Existing plus Stage II," and "Existing plus Phases 1 and 2 plus Stage II" scenarios.

Table 15: Future Project (Phases 1 and 2) and Stage II Intersection Operations Comparison

Intersection	Mobility Target/ Operating Standard	Existing + Phases 1 and 2			Existing + Stage II			Existing + Phases 1 and 2 + Stage II		
		Delay	*LOS*	*v/c*	*Delay*	*LOS*	*v/c*	*Delay*	*LOS*	*v/c*
SW Boones Ferry Road/SW 95th Avenue	LOS D	26.0	C	0.78	26.6	C	0.80	27.1	C	0.81
SW Elligsen Road/I-5 Southbound Ramp	LOS D and 0.90 v/c[a]	17.9	B	0.81	20.1	C	0.87	21.6	C	0.89
Boeckman Road/SW 95th Avenue	LOS D	18.9	B	0.46	19.3	B	0.49	20.7	C	0.50
Boeckman Road/SW Parkway Avenue	LOS D	39.6	D	0.87	46.6	D	0.91	50.3	D	0.93
SW Wilsonville Road/SW Boones Ferry Road	LOS D	38.5	D	0.79	51.3	D	0.91	53.4	D	0.92
SW Wilsonville Road/I-5 Southbound Ramp	LOS D and 0.90 v/c[a]	23.4	C	0.52	23.7	C	0.56	23.9	C	0.57
I-5 Southbound On-Ramp Meter	N/A	-	-	0.92	-	-	0.98	-	-	0.99

Delay = Average Intersection Delay (sec.) v/c = Volume-to-Capacity Ratio LOS = Level of Service

[a]The typical ODOT mobility target for interchange ramps is a 0.85 v/c ratio. However, when the interchange vicinity is fully developed and adequate storage is available on the interchange ramp to prevent queues from backing up on the main line, then the target can be increased to a 0.90 v/c ratio. This is the case for the both I-5 interchange areas in Wilsonville.

Even though the SW Wilsonville Road/Southbound I-5 intersection does meet the 0.90 v/c mobility target for both Phase 1 and Phase 2, the southbound on-ramp signal meter is expected to experience an increase in future demand volumes during the peak hour. The on-ramp meter has a capacity of 1,260 vehicles per hour. These future demand projections would result in the ramp meter experiencing volume-to-capacity ratio of 0.99 by the completion of Phase 2.

Site Plan Evaluation

A site plan showing the proposed development can be found in the appendix. The site plan shows sufficient space for two way motor vehicle circulation except for trucks attempting to reach the proposed loading dock at the south side of the high tech building. Turn radius does not appear to be sufficient for trucks to arrive and depart from the loading dock based on a preliminary evaluation of the site plan provided. It is recommended that the project sponsor provide turn templates showing safe circulation to the loading dock or the project site should be reconfigured to accommodate truck turning movements.

The existing site accesses to the proposed DW Fritz site include two driveways along Boeckman Road. The east driveway provides access to the parking lots on the east side of the

existing building. The west driveway connects to parking lots on the west side of the existing building and provides access to the proposed high tech building and restaurant.

City Code Requirement

The proposed 70,000 square-foot manufacturing building and 4,000 square-foot restaurant is required to comply with the City of Wilsonville Planning and Land Development code for the number of vehicular parking stalls and bicycle parking spaces that are provided on site.[22] Table 16 lists the vehicular and bicycle parking requirements for both the proposed building and the entire site, which are based on the types and square footage of the various building uses. The table also lists the peak parking demand, which is estimated based on parking data published by the Institute of Transportation Engineers (ITE).[23]

Table 16: Vehicular and Bicycle Parking Summary

Land Use (ITE Code)	Size (KSF[a])	Estimated Peak Demand[b]	Spaces Required by City Code[c]		
			Vehicle Minimum	*Vehicle Maximum*	*Bicycle Minimum*
New Building					
Manufacturing (Land Use 140)	70	83	112	No limit	7
Restaurant (Land Use 932)	4	65	61	92	4
Total New Building	**74**	**148**	**173**	**No limit**	**11**
Existing Building					
Manufacturing (Land Use 140)	155	183	248	No limit	16
Total Existing Building	**155**	**183**	**248**	**No limit**	**16**
TOTAL SITE	**229**	**331**	**421**	**No limit**	**27**

[a] KSF = 1,000 square feet

[b] Estimated demand based on 85th percentile identified in the *Parking Generation, 4th Edition*, Institute of Transportation Engineers, 2010.

[c] City of Wilsonville, Planning and Land Development Ordinance, Section 4.155, Table 5, Updated June 2013.

As shown in Table 16, 173 vehicular stalls are needed to meet the minimum City Code requirements for the new building and 148 stalls are needed to satisfy the estimated peak parking demand. For the entire site, 421 vehicular stalls are needed to meet the minimum City Code requirements and 331 stalls are needed to satisfy the estimated peak parking demand. Because the site is expected to have 529 parking stalls, the site is expected to have sufficient available parking. The table above also indicates that 27 bicycle parking spaces are needed at the project site to meet the minimum City Code requirements. Currently, the site plan does not show any bicycle parking spaces. At minimum, 27 bicycle parking spaces will need to be built on the project site and should be located near building entrances in order to provide convenient access.

[22] City of Wilsonville, Planning and Land Development Ordinance, Sections 4.154-4.198, Updated Feb. 2004.

[23] *Parking Generation*, 4rd Edition, Institute of Transportation Engineers, 2010.

Access Spacing and Sight Distance

The two existing driveways along Boeckman Road are spaced at approximately 460 feet from 95th Avenue, approximately 400 feet apart from each other, and approximately 560 feet from Kinsman and do not conform with the City's minimum access spacing standards (600 feet) in the TSP for a minor arterial.[24] The existing accesses will require a variance to the City's access spacing standards.

Preliminary sight distance was evaluated at the existing site driveways on Boeckman Road and there were no concerns. Prior to occupancy, sight distance at any existing access points will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon to assure that buildings, signs or landscaping does not restrict sight distance.

Project Impact Summary

The DW Fritz development is anticipated to result in the following impacts:

Trip Generation

- The development is expected to be completed in two phases; Phase 1 includes a 155,000 square foot renovation to a currently vacant warehouse. Phase 2 includes the addition of a 70,000 square foot high tech building and a 4,000 square foot restaurant.
- Phase 1 of the development is expected to generate an additional 105 (38 in, 67 out) PM peak hour trips and Phases 1 & 2 of the development is expected to generate an additional 164 (64 in, 100 out) PM peak hour trips.
- Of the 105 total Phase 1 project trips, 32 new PM peak hour trips are estimated to pass through the I-5/SW Elligsen Road interchange area and 21 PM peak hour trips through the I-5/Wilsonville Road interchange area.
- Of the total 164 Phase 1 and Phase 2 project trips, 49 new PM peak hour trips are estimated to pass through the I-5/SW Elligsen Road interchange area and 33 PM peak hour trips through the I-5/Wilsonville Road interchange area.

Intersection Operations

- All the study intersections meet the operating standard/mobility targets for all scenarios.

Site Plan Evaluation

- Turn radius does not appear to be sufficient for trucks to arrive and depart from the loading dock based on a preliminary evaluation of the site plan provided. It is recommended that the project sponsor provide turn templates showing safe circulation

[24] City of Wilsonville Transportation System Plan, Table 3-2, Amended June 2016.

to the loading dock or the project site should be reconfigured to accommodate truck turning movements.

- The City Code requirement for vehicular parking is 421 parking stalls at the project site and the parking demand is estimated at 331 parking stalls. The site plan proposes 529 stalls, meeting the city code requirement and parking demand. The minimum bicycle parking stall requirement per City Code is 27 stalls. The site plan does not currently show any bicycle parking stalls.

Access Spacing and Sight Distance

- The driveways along Boeckman Road do not conform with the current minimum access spacing standards (600 feet) in the TSP for a minor arterial. The existing accesses will require a variance to the City's access spacing standards.
- Prior to occupancy, sight distance at any existing access points will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon to assure that buildings, signs or landscaping does not restrict sight distance.

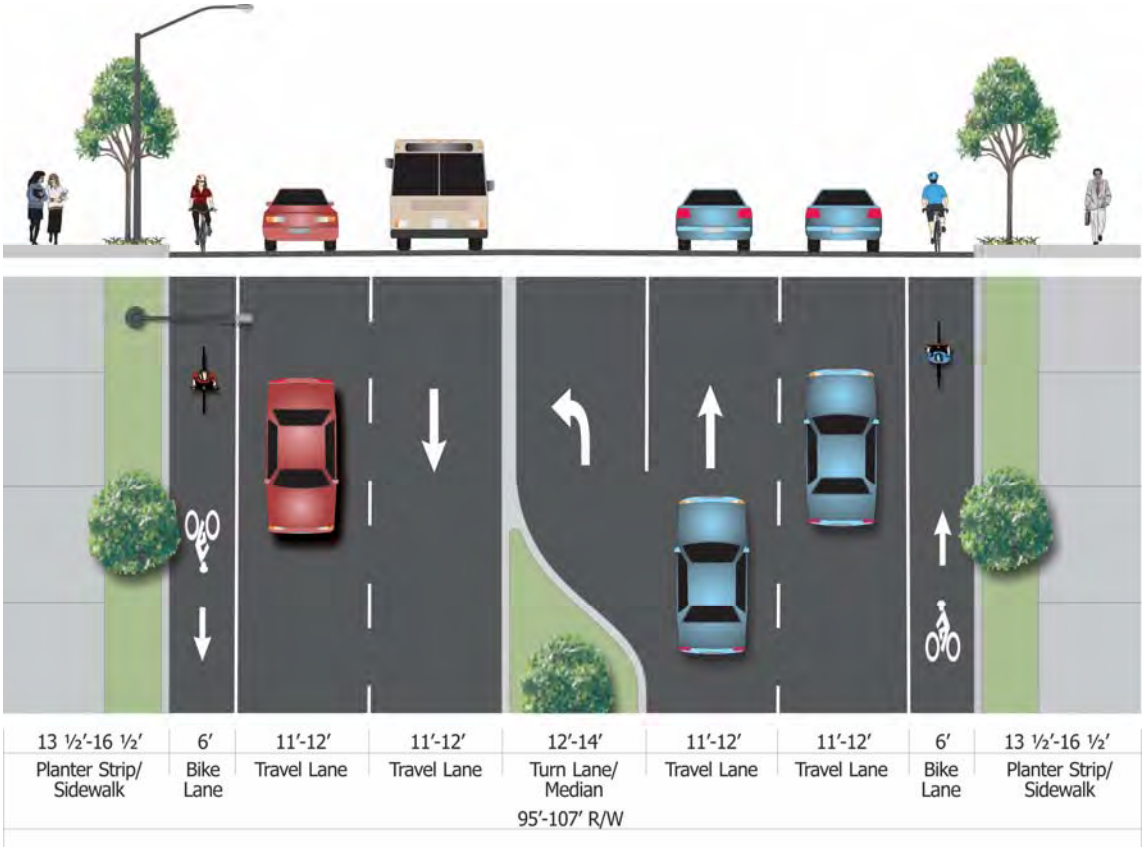
APPENDIX

City of Wilsonville Cross-section Details
City of Wilsonville TSP Planned Projects
Existing PM Peak Hour Traffic Counts
Level of Service Descriptions
Trip Generation Summary
City of Wilsonville Stage II List
HCM Analysis – Existing
HCM Analysis – Existing + Stage II
HCM Analysis – Existing + Project Phase 1
HCM Analysis – Existing + Project Phase 1 + Stage II
HCM Analysis – Existing + Project Phase 2
HCM Analysis – Existing + Project Phase 2 + Stage II

City of Wilsonville Cross-section Details

DKS

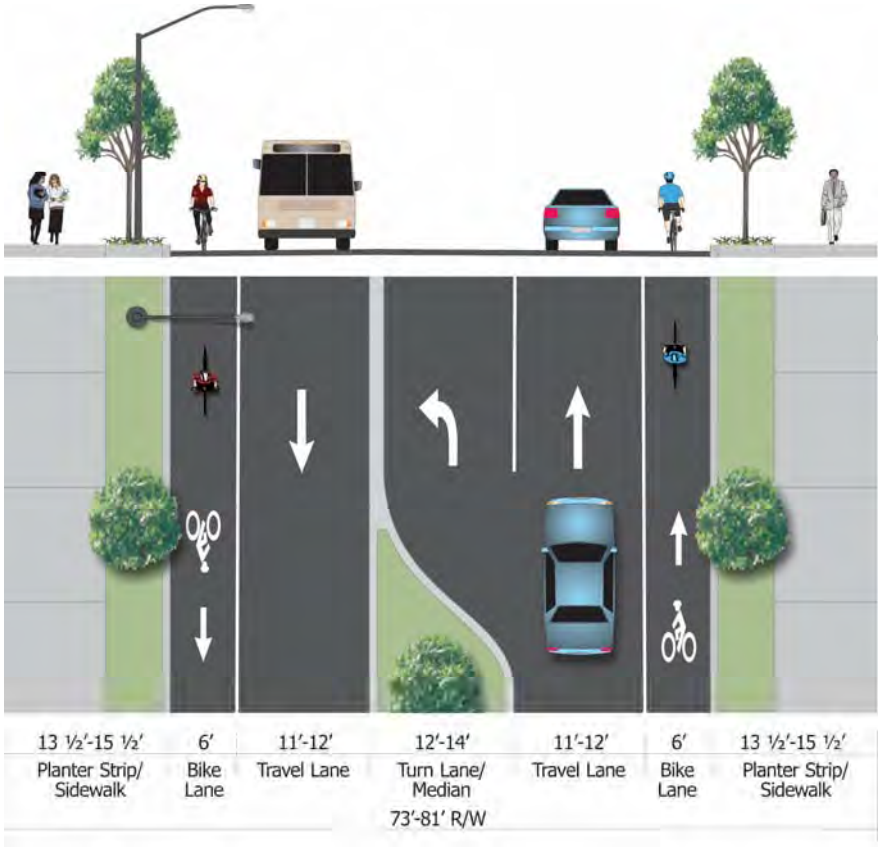
Figure 3-6. Major Arterial Cross-Section



Notes:

1. Travel lane and turn lane/median widths as determined by Community Development Director.
2. Minimum sidewalk width is 5 feet; actual sidewalk width as determined by Community Development Director. Width of sidewalk/planting strip may be combined in commercial/retail areas for a total width of 13½ to 16½ feet; street trees shall be located in minimum 4-foot tree wells.
3. Curb width of ½-foot is included in the sidewalk/planter strip width.
4. Street lights shall be located within the planter strip, center landscape median, or sidewalk as determined by Community Development Director.
5. Striping and signage as required in the PW Standards.
6. On-street parking is not allowed.
7. Transit stop locations to be determined by Transit Director.
8. When not needed as a left-turn lane, median may be provided to serve safety, stormwater, or aesthetic objectives.
9. New streets shall incorporate low impact development design as practicable.
10. Allow for separation for bikes on major arterials (especially freight routes).

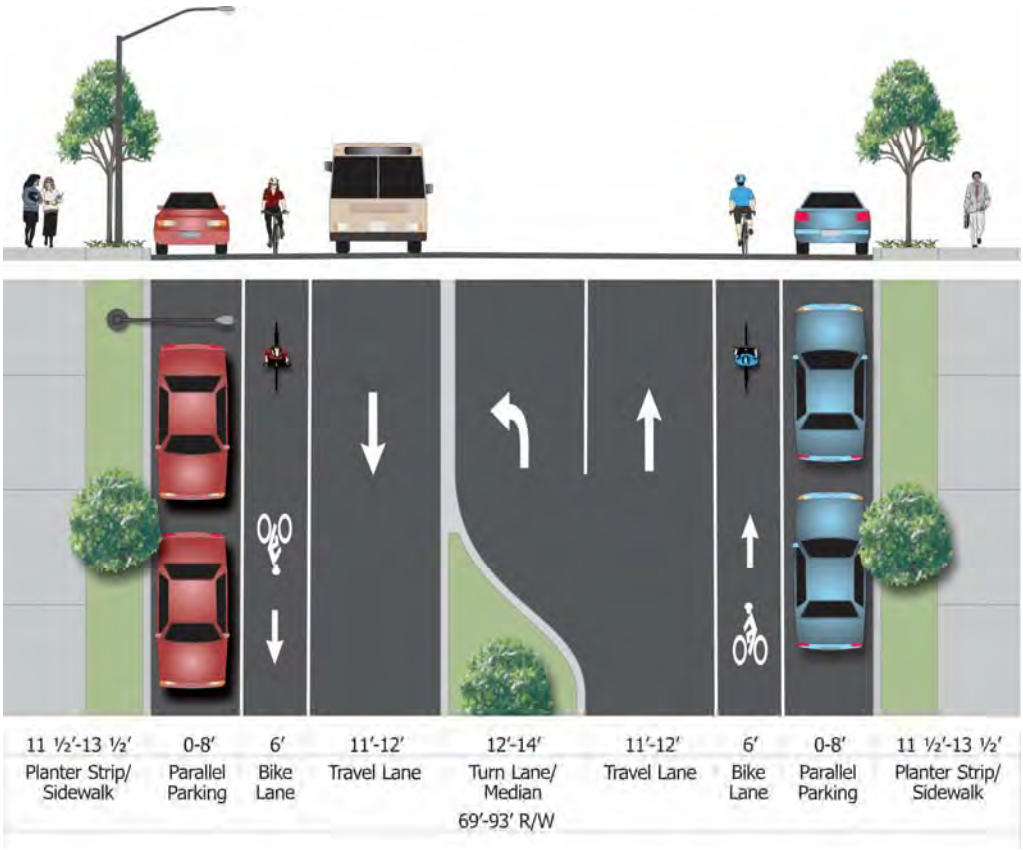
FIGURE 3-7. MINOR ARTERIAL CROSS-SECTION



Notes:

1. Travel lane and turn lane/median widths as determined by Community Development Director.
2. Minimum sidewalk width is 5 feet; actual sidewalk width as determined by Community Development Director. Width of sidewalk/planting strip may be combined in commercial/retail areas for a total width of 13½ to 15½ feet; street trees shall be located in minimum 4-foot tree wells.
3. Curb width of ½ foot is included in the sidewalk/planter strip width.
4. Street lights shall be located within the planter strip, center landscape median, or sidewalk as determined by Community Development Director.
5. Striping and signage as required in the PW Standards.
6. On-street parking is not allowed.
7. Transit stop locations to be determined by Transit Director.
8. When not needed as a left-turn lane, median may be provided to serve safety, stormwater, or aesthetic objectives.
9. New streets shall incorporate low impact development design as practicable.
10. Allow for separation for bikes on minor arterials (especially freight routes).

FIGURE 3-8. COLLECTOR CROSS-SECTION



Notes:

1. Collector right-of-way varies between 59 to 89 feet as determined by Community Development Director based on surrounding planned development of residential, commercial or industrial and need for on-street parking and/or turn lane/median.
2. Minimum sidewalk width is 5 feet; actual sidewalk width as determined by Community Development Director. Width of sidewalk/planting strip may be combined in commercial/retail areas for a total width of 11½ to 13½ feet; street trees shall be located in minimum 4-foot tree wells.
3. Curb and sidewalk bulb-outs at crosswalks or street intersections as determined by Community Development Director.
4. Curb width of ½ foot is included in the sidewalk/planter strip width.
5. Street lights shall be located within the planter strip, center landscape median, or sidewalk as determined by Community Development Director.
6. Travel lane and turn lane/median widths as determined by Community Development Director. Turn lane/median may be eliminated.
7. Striping and signage as required in the PW Standards.
8. On-street parking on one or both sides is allowed.
9. Transit stop locations to be determined by Transit Director.
10. When not needed as a left-turn lane, median may be provided to serve safety, stormwater, or aesthetic objectives.
11. New streets shall incorporate low impact development design as practicable.

City of Wilsonville TSP Planned Projects

Figure 5-2. Higher Priority Projects

This figure provides an overall perspective of the Higher Priority projects throughout the city. Additional details are provided on the pages that follow for each of the City's four quadrants (Northwest, Northeast, Southwest, Southeast), which use I-5 and Boeckman Road as dividing lines.

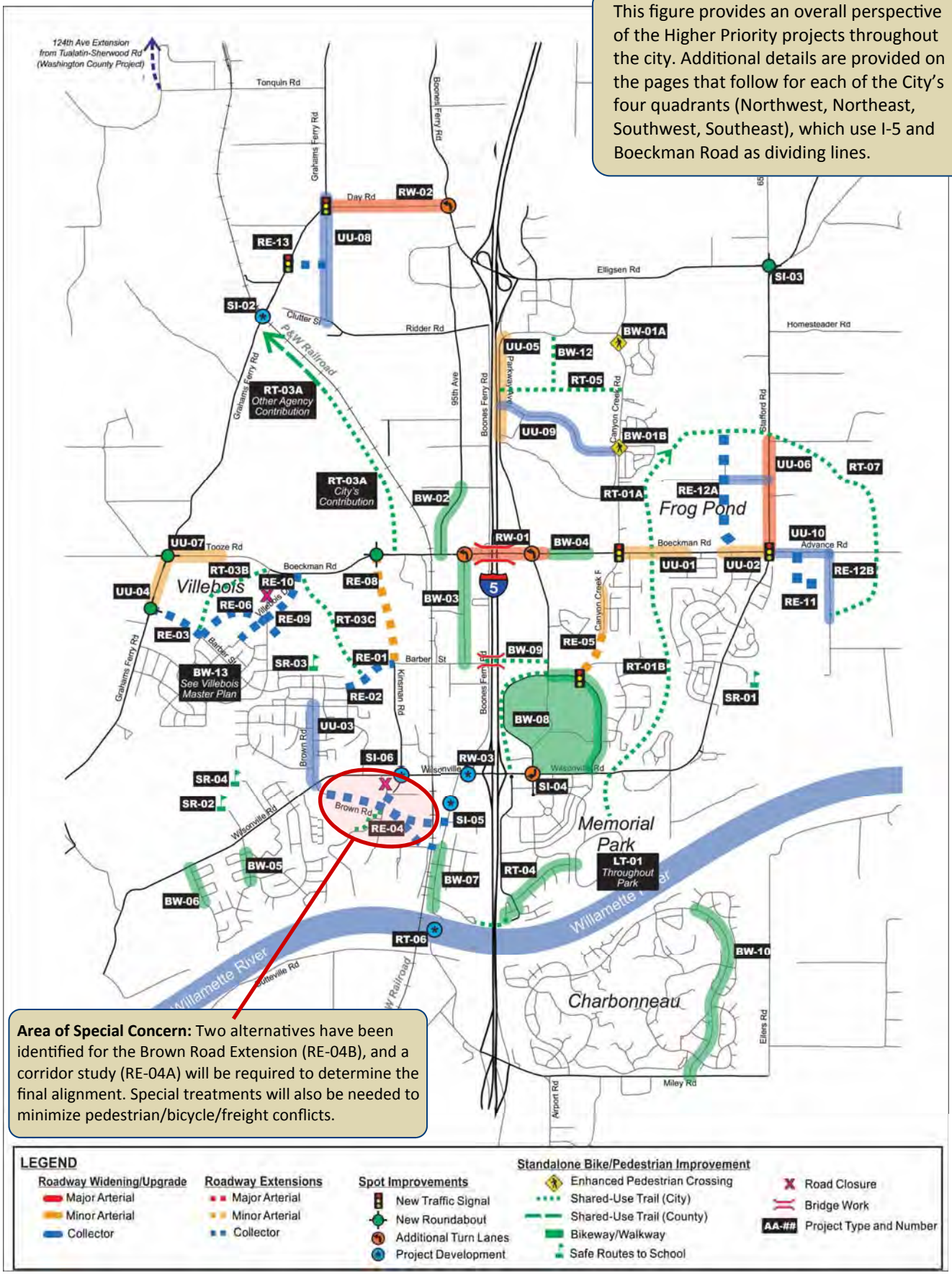
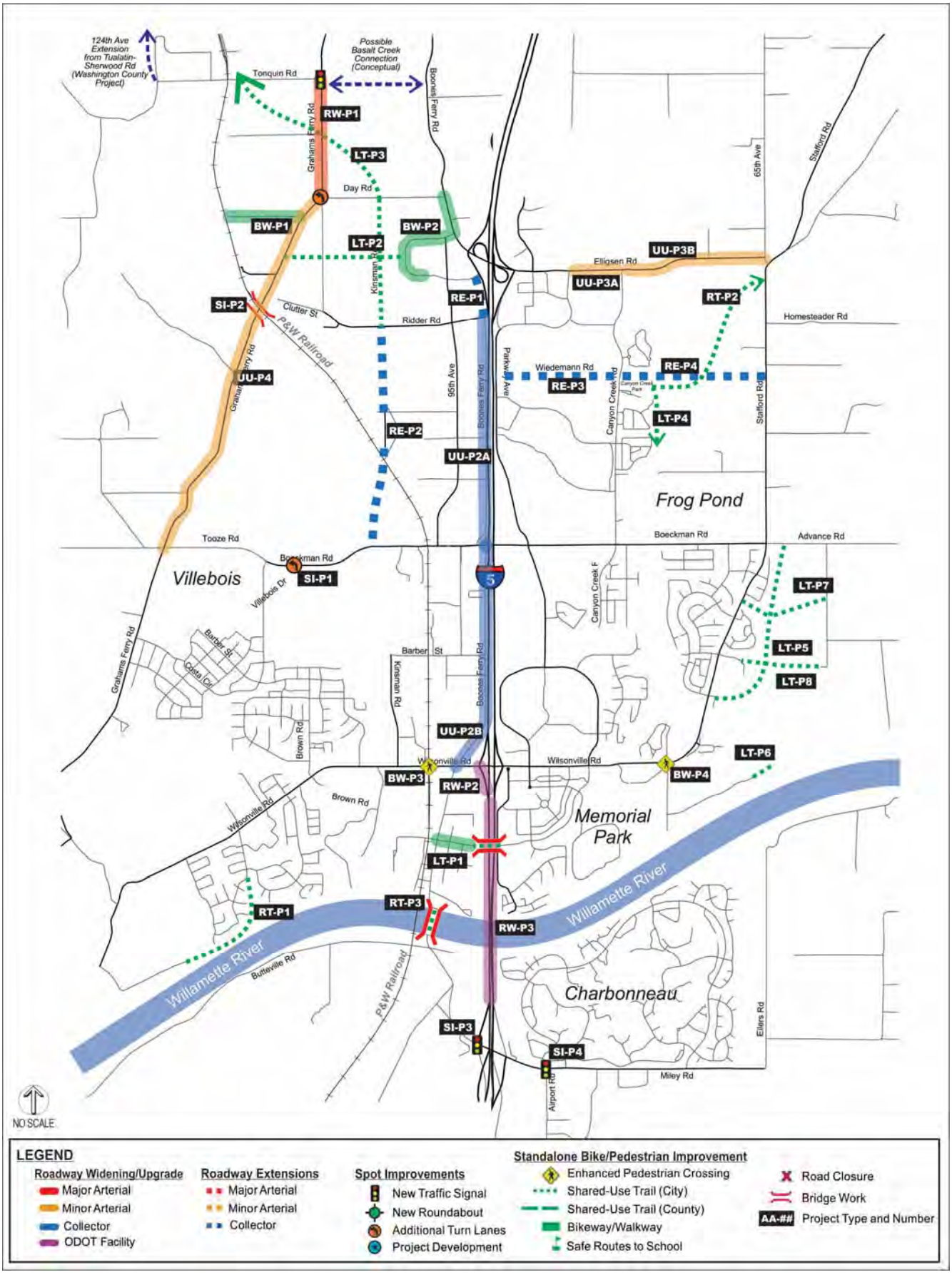


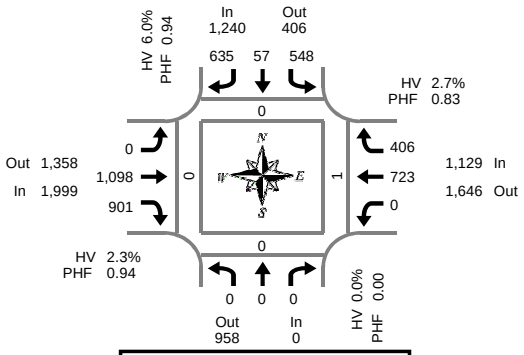
FIGURE 5-7. ADDITIONAL PLANNED PROJECTS



Existing PM Peak Hour Traffic Counts

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:40 PM to 5:40 PM

I-5 SB Ramp & SW Elligsen Rd

Wednesday, June 07, 2017
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Elligsen Rd				Westbound SW Elligsen Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	0	0	39	2	49	0	0	87	85	0	0	54	20	0	336	0	0	0	0
4:05 PM	0	0	0	0	50	4	63	0	0	90	79	0	0	56	26	0	368	0	0	0	0
4:10 PM	0	0	0	0	40	3	52	0	0	99	87	0	0	46	25	0	352	0	0	0	0
4:15 PM	0	0	0	0	39	2	58	0	0	75	68	0	0	54	23	0	319	0	0	0	0
4:20 PM	0	0	0	0	39	5	45	0	0	66	74	0	0	52	20	0	301	0	0	0	0
4:25 PM	0	0	0	0	41	6	38	0	0	96	66	0	0	49	30	0	326	0	0	0	0
4:30 PM	0	0	0	0	42	2	60	0	0	106	69	0	0	49	14	1	342	0	0	0	0
4:35 PM	0	0	0	0	45	4	39	0	0	94	78	0	0	57	36	0	353	0	0	0	0
4:40 PM	0	0	0	0	46	1	56	0	0	105	74	0	0	49	36	0	367	0	0	0	0
4:45 PM	0	0	0	0	53	5	58	0	0	90	85	0	0	52	30	1	373	0	0	0	0
4:50 PM	0	0	0	0	46	2	58	0	0	91	66	1	0	48	22	0	333	0	0	0	0
4:55 PM	0	0	0	0	34	3	47	0	0	91	82	0	0	66	29	0	352	0	0	0	0
5:00 PM	0	0	0	0	31	6	33	0	0	112	77	0	0	69	41	0	369	0	0	0	0
5:05 PM	0	0	0	0	54	5	54	0	0	105	64	0	0	61	47	1	390	0	0	0	0
5:10 PM	0	0	0	0	47	4	56	0	0	96	80	0	0	72	52	0	407	0	0	1	0
5:15 PM	0	0	0	0	50	8	48	0	0	82	85	0	0	59	30	0	362	0	0	0	0
5:20 PM	0	0	0	0	44	5	56	0	0	83	75	0	0	64	26	1	353	0	0	0	0
5:25 PM	0	0	0	0	54	7	56	0	0	65	85	0	0	57	28	1	352	0	0	0	0
5:30 PM	0	0	0	0	42	6	54	0	0	79	68	0	0	56	31	1	336	0	0	0	0
5:35 PM	0	0	0	0	47	5	59	0	0	99	60	0	0	70	34	0	374	0	0	0	0
5:40 PM	0	0	0	0	58	9	59	0	0	79	65	0	0	60	35	0	365	0	0	1	0
5:45 PM	0	0	0	0	51	5	68	0	0	69	68	0	0	46	21	0	328	0	0	0	0
5:50 PM	0	0	0	0	54	7	61	0	0	33	73	0	0	44	25	0	297	0	0	0	0
5:55 PM	0	0	0	0	48	5	70	0	0	63	60	0	0	42	18	1	306	0	0	0	0
Total Survey	0	0	0	0	1,094	111	1,297	0	0	2,055	1,773	1	0	1,332	699	7	8,361	0	0	2	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Elligsen Rd				Westbound SW Elligsen Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	0	0	129	9	164	0	0	276	251	0	0	156	71	0	1,056	0	0	0	0
4:15 PM	0	0	0	0	119	13	141	0	0	237	208	0	0	155	73	0	946	0	0	0	0
4:30 PM	0	0	0	0	133	7	155	0	0	305	221	0	0	155	86	1	1,062	0	0	0	0
4:45 PM	0	0	0	0	133	10	163	0	0	272	233	1	0	166	81	1	1,058	0	0	0	0
5:00 PM	0	0	0	0	132	15	143	0	0	313	221	0	0	202	140	1	1,166	0	0	1	0
5:15 PM	0	0	0	0	148	20	160	0	0	230	245	0	0	180	84	2	1,067	0	0	0	0
5:30 PM	0	0	0	0	147	20	172	0	0	257	193	0	0	186	100	1	1,075	0	0	1	0
5:45 PM	0	0	0	0	153	17	199	0	0	165	201	0	0	132	64	1	931	0	0	0	0
Total Survey	0	0	0	0	1,094	111	1,297	0	0	2,055	1,773	1	0	1,332	699	7	8,361	0	0	2	0

Peak Hour Summary
4:40 PM to 5:40 PM

By Approach	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Elligsen Rd				Westbound SW Elligsen Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	958	958	0	1,240	406	1,646	0	1,999	1,358	3,357	1	1,129	1,646	2,775	5	4,368	0	0	1	0
%HV		0.0%				6.0%				2.3%				2.7%			3.5%				
PHF		0.00				0.94				0.94				0.83			0.94				

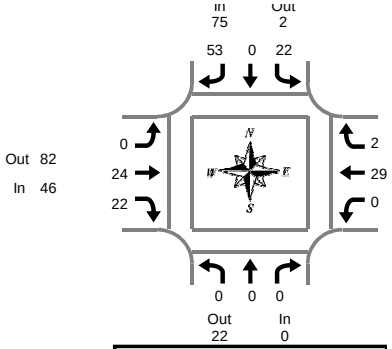
By Movement	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Elligsen Rd				Westbound SW Elligsen Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	548	57	635	1,240	0	1,098	901	1,999	0	723	406	1,129	4,368
%HV	0.0%	0.0%	0.0%	0.0%	4.0%	0.0%	8.3%	6.0%	0.0%	2.2%	2.4%	2.3%	0.0%	4.0%	0.5%	2.7%	3.5%
PHF	0.00	0.00	0.00	0.00	0.91	0.71	0.92	0.94	0.00	0.88	0.92	0.94	0.00	0.89	0.73	0.83	0.94

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Elligsen Rd				Westbound SW Elligsen Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	0	0	514	39	623	0	0	1,090	913	1	0	632	311	2	4,122	0	0	0	0
4:15 PM	0	0	0	0	517	45	602	0	0	1,127	883	1	0	678	380	3	4,232	0	0	1	0
4:30 PM	0	0	0	0	546	52	621	0	0	1,120	920	1	0	703	391	5	4,353	0	0	1	0
4:45 PM	0	0	0	0	560	65	638	0	0	1,072	892	1	0	734	405	5	4,366	0	0	2	0
5:00 PM	0	0	0	0	580	72	674	0	0	965	860	0	0	700	388	5	4,239	0	0	2	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



I-5 SB Ramp & SW Elligsen Rd

Wednesday, June 07, 2017
4:00 PM to 6:00 PM

Peak Hour Summary
4:40 PM to 5:40 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Elligsen Rd				Westbound SW Elligsen Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	2	0	5	7	0	4	4	8	0	3	0	3	18
4:05 PM	0	0	0	0	3	0	9	12	0	3	6	9	0	4	0	4	25
4:10 PM	0	0	0	0	2	0	5	7	0	3	1	4	0	2	1	3	14
4:15 PM	0	0	0	0	0	0	10	10	0	5	4	9	0	3	1	4	23
4:20 PM	0	0	0	0	2	0	6	8	0	2	2	4	0	4	1	5	17
4:25 PM	0	0	0	0	2	0	1	3	0	5	1	6	0	6	1	7	16
4:30 PM	0	0	0	0	1	0	12	13	0	4	2	6	0	4	0	4	23
4:35 PM	0	0	0	0	0	0	6	6	0	1	3	4	0	5	0	5	15
4:40 PM	0	0	0	0	1	0	10	11	0	3	3	6	0	4	0	4	21
4:45 PM	0	0	0	0	4	0	8	12	0	2	4	6	0	1	0	1	19
4:50 PM	0	0	0	0	3	0	5	8	0	1	2	3	0	2	0	2	13
4:55 PM	0	0	0	0	1	0	4	5	0	3	3	6	0	1	0	1	12
5:00 PM	0	0	0	0	2	0	1	3	0	2	1	3	0	7	1	8	14
5:05 PM	0	0	0	0	0	0	3	3	0	4	0	4	0	2	1	3	10
5:10 PM	0	0	0	0	1	0	6	7	0	2	1	3	0	0	0	0	10
5:15 PM	0	0	0	0	2	0	4	6	0	4	2	6	0	4	0	4	16
5:20 PM	0	0	0	0	3	0	1	4	0	0	4	4	0	1	0	1	9
5:25 PM	0	0	0	0	4	0	3	7	0	1	0	1	0	2	0	2	10
5:30 PM	0	0	0	0	1	0	6	7	0	0	1	1	0	4	0	4	12
5:35 PM	0	0	0	0	0	0	2	2	0	2	1	3	0	1	0	1	6
5:40 PM	0	0	0	0	3	0	4	7	0	2	0	2	0	2	0	2	11
5:45 PM	0	0	0	0	2	0	2	4	0	3	2	5	0	0	1	1	10
5:50 PM	0	0	0	0	0	0	3	3	0	2	1	3	0	3	0	3	9
5:55 PM	0	0	0	0	2	0	3	5	0	4	2	6	0	1	0	1	12
Total Survey	0	0	0	0	41	0	119	160	0	62	50	112	0	66	7	73	345

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Elligsen Rd				Westbound SW Elligsen Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	7	0	19	26	0	10	11	21	0	9	1	10	57
4:15 PM	0	0	0	0	4	0	17	21	0	12	7	19	0	13	3	16	56
4:30 PM	0	0	0	0	2	0	28	30	0	8	8	16	0	13	0	13	59
4:45 PM	0	0	0	0	8	0	17	25	0	6	9	15	0	4	0	4	44
5:00 PM	0	0	0	0	3	0	10	13	0	8	2	10	0	9	2	11	34
5:15 PM	0	0	0	0	9	0	8	17	0	5	6	11	0	7	0	7	35
5:30 PM	0	0	0	0	4	0	12	16	0	4	2	6	0	7	0	7	29
5:45 PM	0	0	0	0	4	0	8	12	0	9	5	14	0	4	1	5	31
Total Survey	0	0	0	0	41	0	119	160	0	62	50	112	0	66	7	73	345

Heavy Vehicle Peak Hour Summary
4:40 PM to 5:40 PM

By Approach	Northbound I-5 SB Ramp			Southbound I-5 SB Ramp			Eastbound SW Elligsen Rd			Westbound SW Elligsen Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	22	22	75	2	77	46	82	128	31	46	77	152
PHF	0.00			0.60			0.77			0.65			0.72

By Movement	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Elligsen Rd				Westbound SW Elligsen Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	22	0	53	75	0	24	22	46	0	29	2	31	152
PHF	0.00	0.00	0.00	0.00	0.61	0.00	0.58	0.60	0.00	0.60	0.61	0.77	0.00	0.73	0.25	0.65	0.72

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Elligsen Rd				Westbound SW Elligsen Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	21	0	81	102	0	36	35	71	0	39	4	43	216
4:15 PM	0	0	0	0	17	0	72	89	0	34	26	60	0	39	5	44	193
4:30 PM	0	0	0	0	22	0	63	85	0	27	25	52	0	33	2	35	172
4:45 PM	0	0	0	0	24	0	47	71	0	23	19	42	0	27	2	29	142
5:00 PM	0	0	0	0	20	0	38	58	0	26	15	41	0	27	3	30	129

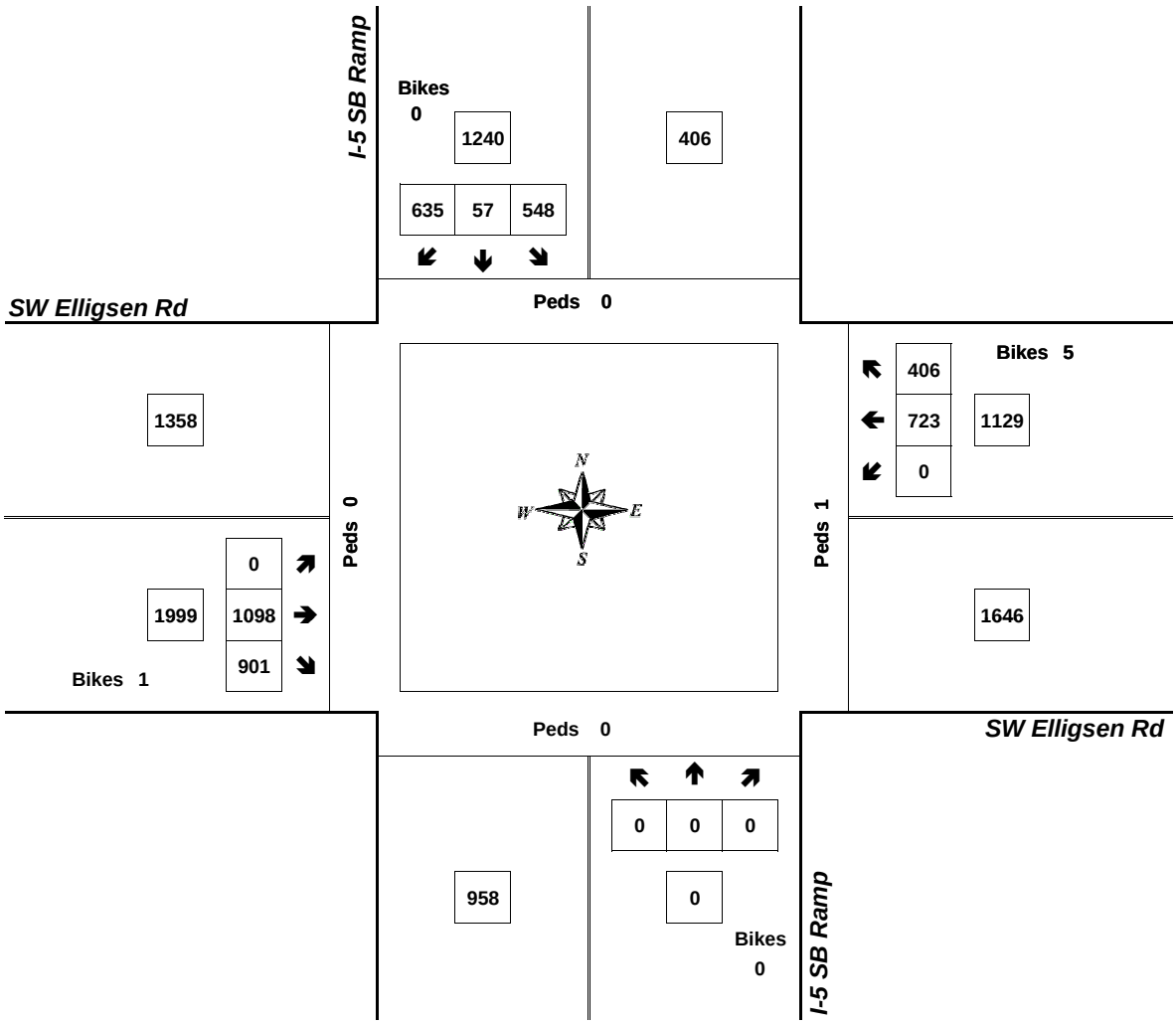
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

I-5 SB Ramp & SW Elligsen Rd

4:40 PM to 5:40 PM
Wednesday, June 07, 2017

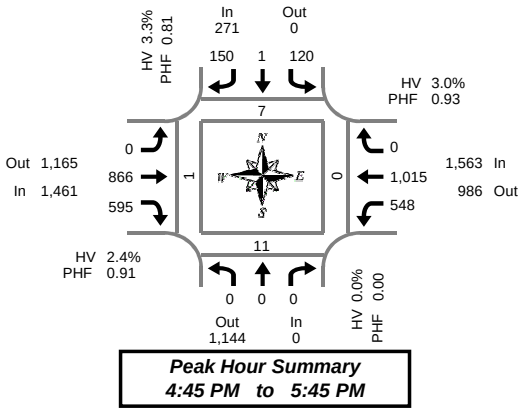


Approach	PHF	HV%	Volume
EB	0.94	2.3%	1,999
WB	0.83	2.7%	1,129
NB	0.00	0.0%	0
SB	0.94	6.0%	1,240
Intersection	0.94	3.5%	4,368

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



I-5 SB Ramp & SW Wilsonville Rd

Wednesday, June 07, 2017
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	0	0	9	0	11	0	0	64	60	0	37	62	0	0	243	0	0	0	0
4:05 PM	0	0	0	0	4	0	13	0	0	96	47	0	31	77	0	0	268	0	1	0	0
4:10 PM	0	0	0	0	6	0	9	0	0	74	41	0	49	80	0	0	259	0	1	0	0
4:15 PM	0	0	0	0	15	0	8	0	0	54	46	0	51	74	0	1	248	3	0	0	0
4:20 PM	0	0	0	0	12	0	10	0	0	65	49	0	41	75	0	0	252	3	2	0	0
4:25 PM	0	0	0	0	9	0	8	0	0	95	44	0	40	70	0	0	266	3	1	0	0
4:30 PM	0	0	0	0	4	0	9	0	0	66	45	0	51	87	0	1	262	0	0	0	0
4:35 PM	0	0	0	0	7	0	12	0	0	58	37	0	47	70	0	1	231	0	0	0	0
4:40 PM	0	0	0	0	11	0	11	0	0	64	48	0	34	93	0	0	261	2	1	0	0
4:45 PM	0	0	0	0	15	0	13	0	0	72	41	0	53	97	0	0	291	0	1	0	0
4:50 PM	0	0	0	0	9	0	17	1	0	62	46	0	52	83	0	0	269	0	0	0	0
4:55 PM	0	0	0	0	9	0	8	0	0	55	56	0	56	80	0	0	264	1	0	0	0
5:00 PM	0	0	0	0	5	0	15	0	0	73	63	0	26	71	0	0	253	1	0	0	0
5:05 PM	0	0	0	0	4	0	11	0	0	77	52	0	55	100	0	0	299	0	1	0	0
5:10 PM	0	0	0	0	16	0	6	0	0	89	46	0	50	75	0	0	282	2	0	0	0
5:15 PM	0	0	0	0	12	1	12	0	0	62	45	0	45	76	0	0	253	0	3	0	0
5:20 PM	0	0	0	0	12	0	8	0	0	83	49	0	42	95	0	0	289	1	0	0	0
5:25 PM	0	0	0	0	3	0	11	0	0	95	46	0	51	90	0	0	296	0	1	0	1
5:30 PM	0	0	0	0	7	0	12	0	0	49	50	0	48	76	0	1	242	1	1	0	0
5:35 PM	0	0	0	0	17	0	19	0	0	74	57	0	36	66	0	2	269	0	0	0	0
5:40 PM	0	0	0	0	11	0	18	0	0	75	44	0	34	106	0	0	288	1	4	0	0
5:45 PM	0	0	0	0	11	0	7	0	0	79	43	0	45	87	0	1	272	2	0	0	2
5:50 PM	0	0	0	0	5	0	10	0	0	60	54	2	51	75	0	0	255	0	0	0	0
5:55 PM	0	0	0	0	10	0	11	0	0	66	42	0	45	86	0	0	260	0	0	0	0
Total Survey	0	0	0	0	223	1	269	1	0	1,707	1,151	2	1,070	1,951	0	7	6,372	20	17	0	3

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	0	0	19	0	33	0	0	234	148	0	117	219	0	0	770	0	2	0	0
4:15 PM	0	0	0	0	36	0	26	0	0	214	139	0	132	219	0	1	766	9	3	0	0
4:30 PM	0	0	0	0	22	0	32	0	0	188	130	0	132	250	0	2	754	2	1	0	0
4:45 PM	0	0	0	0	33	0	38	1	0	189	143	0	161	260	0	0	824	1	1	0	0
5:00 PM	0	0	0	0	25	0	32	0	0	239	161	0	131	246	0	0	834	3	1	0	0
5:15 PM	0	0	0	0	27	1	31	0	0	240	140	0	138	261	0	0	838	1	4	0	1
5:30 PM	0	0	0	0	35	0	49	0	0	198	151	0	118	248	0	3	799	2	5	0	0
5:45 PM	0	0	0	0	26	0	28	0	0	205	139	2	141	248	0	1	787	2	0	0	2
Total Survey	0	0	0	0	223	1	269	1	0	1,707	1,151	2	1,070	1,951	0	7	6,372	20	17	0	3

Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Total
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	
Volume	0	1,144	1,144	0	271	0	271	1	1,461	1,165	2,626	0	1,563	986	2,549	3	3,295
%HV	0.0%				3.3%				2.4%				3.0%				2.8%
PHF	0.00				0.81				0.91				0.93				0.98

Pedestrians Crosswalk			
North	South	East	West
7	11	0	1

By Movement	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	120	1	150	271	0	866	595	1,461	548	1,015	0	1,563	3,295
%HV	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.0%	3.3%	0.0%	1.5%	3.7%	2.4%	0.5%	4.3%	0.0%	3.0%	2.8%
PHF	0.00	0.00	0.00	0.00	0.75	0.25	0.77	0.81	0.00	0.90	0.87	0.91	0.85	0.97	0.00	0.93	0.98

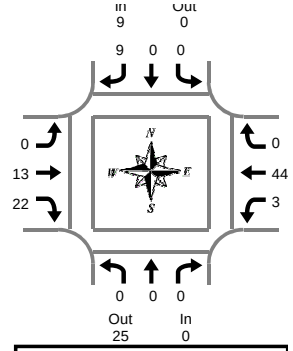
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	0	0	110	0	129	1	0	825	560	0	542	948	0	3	3,114	12	7	0	0
4:15 PM	0	0	0	0	116	0	128	1	0	830	573	0	556	975	0	3	3,178	15	6	0	0
4:30 PM	0	0	0	0	107	1	133	1	0	856	574	0	562	1,017	0	2	3,250	7	7	0	1
4:45 PM	0	0	0	0	120	1	150	1	0	866	595	0	548	1,015	0	3	3,295	7	11	0	1
5:00 PM	0	0	0	0	113	1	140	0	0	882	591	2	528	1,003	0	4	3,258	8	10	0	3

Heavy Vehicle Summary

Clay Carney
(503) 833-2740

Out 53
In 35



Peak Hour Summary
4:45 PM to 5:45 PM

I-5 SB Ramp & SW Wilsonville Rd

Wednesday, June 07, 2017
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	5	0	5	0	2	0	2	7
4:05 PM	0	0	0	0	0	0	3	3	0	6	2	8	0	4	0	4	15
4:10 PM	0	0	0	0	0	0	0	0	0	3	3	6	0	2	0	2	8
4:15 PM	0	0	0	0	0	0	1	1	0	5	0	5	4	7	0	11	17
4:20 PM	0	0	0	0	0	0	1	1	0	3	2	5	0	5	0	5	11
4:25 PM	0	0	0	0	0	0	1	1	0	2	0	2	1	5	0	6	9
4:30 PM	0	0	0	0	1	0	1	2	0	1	1	2	1	4	0	5	9
4:35 PM	0	0	0	0	0	0	1	1	0	1	0	1	0	3	0	3	5
4:40 PM	0	0	0	0	1	0	0	1	0	2	3	5	1	6	0	7	13
4:45 PM	0	0	0	0	0	0	0	0	0	3	5	8	0	3	0	3	11
4:50 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	5	0	5	6
4:55 PM	0	0	0	0	0	0	1	1	0	1	1	2	0	2	0	2	5
5:00 PM	0	0	0	0	0	0	0	0	0	0	3	3	0	12	0	12	15
5:05 PM	0	0	0	0	0	0	1	1	0	1	1	2	0	4	0	4	7
5:10 PM	0	0	0	0	0	0	2	2	0	2	1	3	0	0	0	0	5
5:15 PM	0	0	0	0	0	0	1	1	0	1	2	3	1	3	0	4	8
5:20 PM	0	0	0	0	0	0	0	0	0	3	1	4	0	7	0	7	11
5:25 PM	0	0	0	0	0	0	1	1	0	0	1	1	0	3	0	3	5
5:30 PM	0	0	0	0	0	0	0	0	0	0	2	2	0	2	0	2	4
5:35 PM	0	0	0	0	0	0	1	1	0	1	1	2	0	0	0	0	3
5:40 PM	0	0	0	0	0	0	2	2	0	1	3	4	2	3	0	5	11
5:45 PM	0	0	0	0	1	0	0	1	0	4	2	6	2	5	0	7	14
5:50 PM	0	0	0	0	0	0	1	1	0	1	0	1	1	1	0	2	4
5:55 PM	0	0	0	0	2	0	1	3	0	0	1	1	0	2	0	2	6
Total Survey	0	0	0	0	5	0	19	24	0	46	36	82	13	90	0	103	209

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	3	3	0	14	5	19	0	8	0	8	30
4:15 PM	0	0	0	0	0	0	3	3	0	10	2	12	5	17	0	22	37
4:30 PM	0	0	0	0	2	0	2	4	0	4	4	8	2	13	0	15	27
4:45 PM	0	0	0	0	0	0	1	1	0	4	7	11	0	10	0	10	22
5:00 PM	0	0	0	0	0	0	3	3	0	3	5	8	0	16	0	16	27
5:15 PM	0	0	0	0	0	0	2	2	0	4	4	8	1	13	0	14	24
5:30 PM	0	0	0	0	0	0	3	3	0	2	6	8	2	5	0	7	18
5:45 PM	0	0	0	0	3	0	2	5	0	5	3	8	3	8	0	11	24
Total Survey	0	0	0	0	5	0	19	24	0	46	36	82	13	90	0	103	209

Heavy Vehicle Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound I-5 SB Ramp			Southbound I-5 SB Ramp			Eastbound SW Wilsonville Rd			Westbound SW Wilsonville Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	25	25	9	0	9	35	53	88	47	13	60	91
PHF	0.00			0.56			0.80			0.62			0.84

By Movement	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	0	0	9	9	0	13	22	35	3	44	0	47	91
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.56	0.00	0.54	0.79	0.80	0.38	0.58	0.00	0.62	0.84

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	2	0	9	11	0	32	18	50	7	48	0	55	116
4:15 PM	0	0	0	0	2	0	9	11	0	21	18	39	7	56	0	63	113
4:30 PM	0	0	0	0	2	0	8	10	0	15	20	35	3	52	0	55	100
4:45 PM	0	0	0	0	0	0	9	9	0	13	22	35	3	44	0	47	91
5:00 PM	0	0	0	0	3	0	10	13	0	14	18	32	6	42	0	48	93

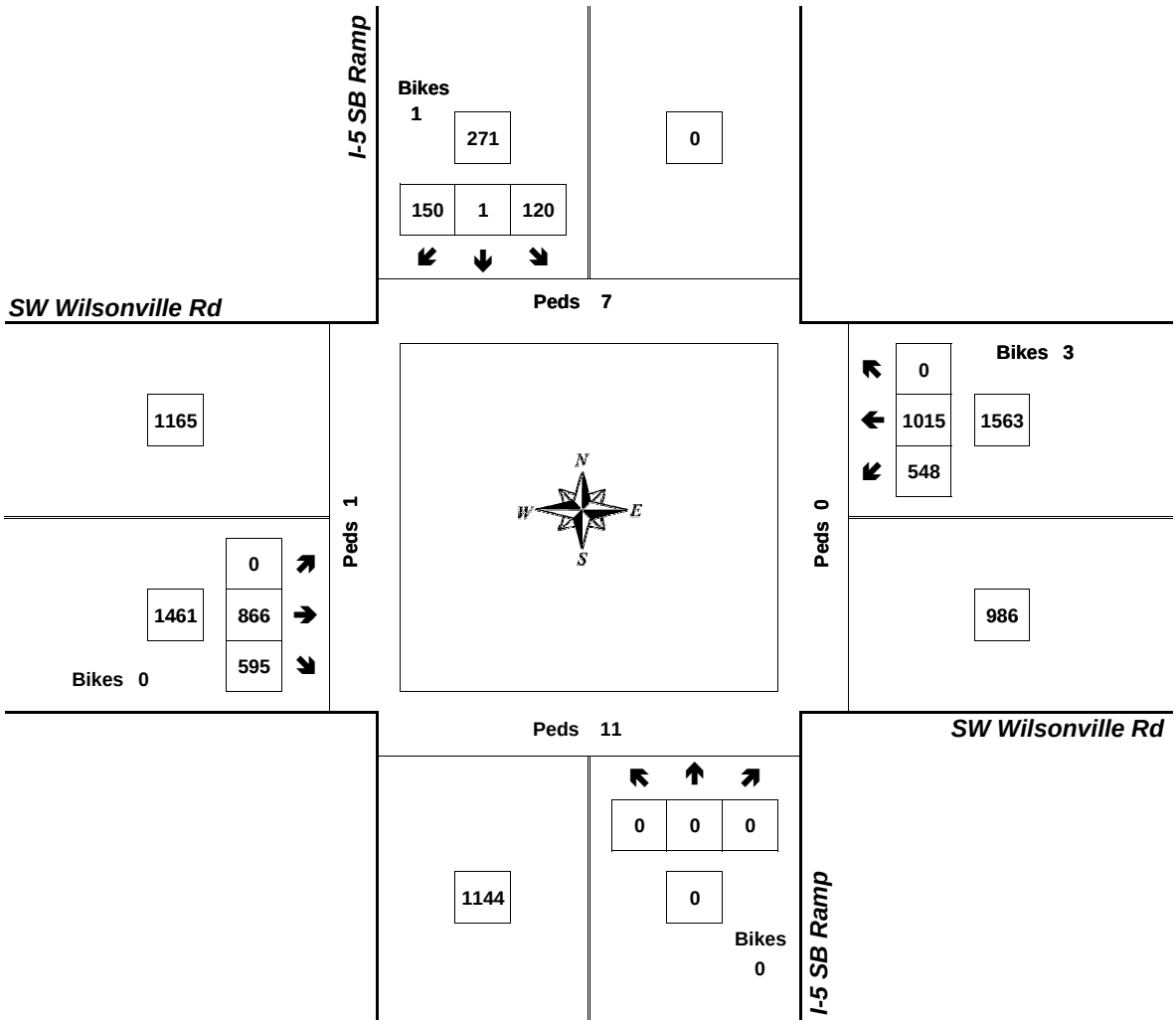
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

I-5 SB Ramp & SW Wilsonville Rd

4:45 PM to 5:45 PM
Wednesday, June 07, 2017

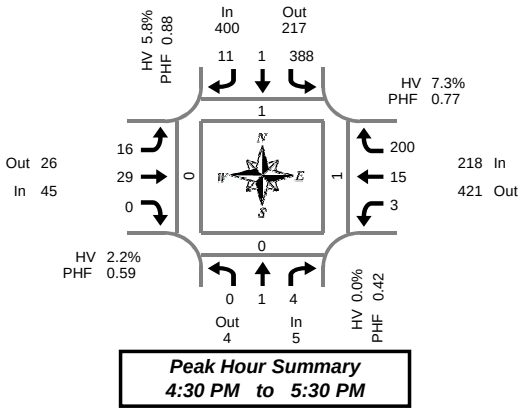


Approach	PHF	HV%	Volume
EB	0.91	2.4%	1,461
WB	0.93	3.0%	1,563
NB	0.00	0.0%	0
SB	0.81	3.3%	271
Intersection	0.98	2.8%	3,295

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:30 PM to 5:30 PM

SW 95th Ave & SW Boeckman Rd

Wednesday, June 07, 2017
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW 95th Ave				Southbound SW 95th Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	1	1	0	24	1	2	0	2	2	0	0	0	1	14	0	48	0	0	0	0
4:05 PM	0	1	2	0	39	0	1	0	6	3	0	0	0	0	15	1	67	0	0	0	0
4:10 PM	0	0	1	0	33	0	3	0	2	2	0	0	0	1	19	0	61	0	0	0	0
4:15 PM	0	2	0	0	40	0	1	0	1	4	0	0	0	0	16	0	64	0	0	0	0
4:20 PM	0	0	0	0	24	0	1	0	1	1	0	0	0	0	11	0	38	0	0	0	0
4:25 PM	0	0	0	0	31	1	1	0	1	3	0	0	0	0	14	0	51	0	0	0	0
4:30 PM	0	0	2	0	36	0	0	0	1	4	0	0	1	2	17	0	63	0	0	0	0
4:35 PM	0	1	0	0	35	0	3	5	2	3	0	0	0	1	18	0	63	0	0	0	0
4:40 PM	0	0	0	0	27	0	1	1	1	1	0	1	1	1	13	0	45	1	0	1	0
4:45 PM	0	0	0	0	36	0	0	0	1	0	0	0	0	1	15	1	53	0	0	0	0
4:50 PM	0	0	2	0	23	0	1	1	1	2	0	0	1	1	17	0	48	0	0	0	0
4:55 PM	0	0	0	0	33	1	0	0	2	3	0	0	0	0	8	0	47	0	0	0	0
5:00 PM	0	0	0	0	35	0	0	0	0	1	0	0	0	2	15	0	53	0	0	0	0
5:05 PM	0	0	0	0	35	0	0	0	2	1	0	0	0	2	17	1	57	0	0	0	0
5:10 PM	0	0	0	0	37	0	1	0	1	6	0	0	0	1	13	0	59	0	0	0	0
5:15 PM	0	0	0	0	40	0	1	0	3	2	0	0	0	1	25	0	72	0	0	0	0
5:20 PM	0	0	0	0	27	0	2	0	2	5	0	0	0	3	14	0	53	0	0	0	0
5:25 PM	0	0	0	0	24	0	2	0	0	1	0	0	0	0	28	0	55	0	0	0	0
5:30 PM	0	1	0	0	30	0	1	0	0	1	0	0	0	1	16	0	50	0	0	0	0
5:35 PM	0	0	1	0	33	0	0	0	0	1	0	0	0	2	11	0	48	0	0	0	0
5:40 PM	0	1	0	0	35	0	3	0	0	2	0	0	0	2	18	1	61	0	0	0	0
5:45 PM	0	0	1	0	29	0	1	0	0	2	0	0	0	0	11	1	44	0	0	0	0
5:50 PM	0	0	0	0	30	0	0	0	0	0	0	0	0	0	15	0	45	0	0	0	0
5:55 PM	0	0	0	0	29	0	2	0	0	1	0	0	0	2	16	0	50	0	0	0	0
Total Survey	0	7	10	0	765	3	27	7	29	51	0	1	3	24	376	5	1,295	1	0	1	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW 95th Ave				Southbound SW 95th Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	2	4	0	96	1	6	0	10	7	0	0	0	2	48	1	176	0	0	0	0
4:15 PM	0	2	0	0	95	1	3	0	3	8	0	0	0	0	41	0	153	0	0	0	0
4:30 PM	0	1	2	0	98	0	4	6	4	8	0	1	2	4	48	0	171	1	0	1	0
4:45 PM	0	0	2	0	92	1	1	1	4	5	0	0	1	2	40	1	148	0	0	0	0
5:00 PM	0	0	0	0	107	0	1	0	3	8	0	0	0	5	45	1	169	0	0	0	0
5:15 PM	0	0	0	0	91	0	5	0	5	8	0	0	0	4	67	0	180	0	0	0	0
5:30 PM	0	2	1	0	98	0	4	0	0	4	0	0	0	5	45	1	159	0	0	0	0
5:45 PM	0	0	1	0	88	0	3	0	0	3	0	0	0	2	42	1	139	0	0	0	0
Total Survey	0	7	10	0	765	3	27	7	29	51	0	1	3	24	376	5	1,295	1	0	1	0

Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound SW 95th Ave				Southbound SW 95th Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	5	4	9	0	400	217	617	7	45	26	71	1	218	421	639	2	668	1	0	1	0
%HV	0.0%				5.8%				2.2%				7.3%				6.0%				
PHF	0.42				0.88				0.59				0.77				0.89				

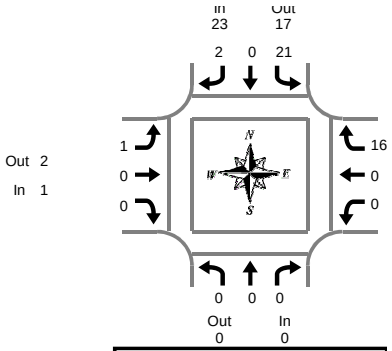
By Movement	Northbound SW 95th Ave				Southbound SW 95th Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	1	4	5	388	1	11	400	16	29	0	45	3	15	200	218	668
%HV	0.0%	0.0%	0.0%	0.0%	5.4%	0.0%	18.2%	5.8%	6.3%	0.0%	0.0%	2.2%	0.0%	0.0%	8.0%	7.3%	6.0%
PHF	0.00	0.25	0.50	0.42	0.87	0.25	0.55	0.88	0.67	0.56	0.00	0.59	0.38	0.75	0.75	0.77	0.89

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW 95th Ave				Southbound SW 95th Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	5	8	0	381	3	14	7	21	28	0	1	3	8	177	2	648	1	0	1	0
4:15 PM	0	3	4	0	392	2	9	7	14	29	0	1	3	11	174	2	641	1	0	1	0
4:30 PM	0	1	4	0	388	1	11	7	16	29	0	1	3	15	200	2	668	1	0	1	0
4:45 PM	0	2	3	0	388	1	11	1	12	25	0	0	1	16	197	3	656	0	0	0	0
5:00 PM	0	2	2	0	384	0	13	0	8	23	0	0	0	16	199	3	647	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



SW 95th Ave & SW Boeckman Rd

Wednesday, June 07, 2017
4:00 PM to 6:00 PM

Peak Hour Summary
4:30 PM to 5:30 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW 95th Ave				Southbound SW 95th Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:05 PM	0	0	0	0	3	0	0	3	1	0	0	1	0	0	2	2	6
4:10 PM	0	0	0	0	3	0	1	4	0	0	0	0	0	0	2	2	6
4:15 PM	0	0	0	0	3	0	0	3	0	0	0	0	0	0	3	3	6
4:20 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	2
4:25 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
4:30 PM	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	3	5
4:35 PM	0	0	0	0	4	0	1	5	0	0	0	0	0	0	3	3	8
4:40 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	2
4:45 PM	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	5
4:50 PM	0	0	0	0	2	0	0	2	1	0	0	1	0	0	3	3	6
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
5:05 PM	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	2	4
5:10 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	2	3
5:20 PM	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	3
5:25 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:35 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	2
5:40 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:50 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Total Survey	0	0	0	0	34	0	3	37	3	0	0	3	0	0	26	26	66

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW 95th Ave				Southbound SW 95th Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	6	0	1	7	1	0	0	1	0	0	4	4	12
4:15 PM	0	0	0	0	4	0	0	4	1	0	0	1	0	0	4	4	9
4:30 PM	0	0	0	0	6	0	2	8	0	0	0	0	0	0	7	7	15
4:45 PM	0	0	0	0	7	0	0	7	1	0	0	1	0	0	3	3	11
5:00 PM	0	0	0	0	3	0	0	3	0	0	0	0	0	0	4	4	7
5:15 PM	0	0	0	0	5	0	0	5	0	0	0	0	0	0	2	2	7
5:30 PM	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	1	3
5:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	2
Total Survey	0	0	0	0	34	0	3	37	3	0	0	3	0	0	26	26	66

Heavy Vehicle Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound SW 95th Ave			Southbound SW 95th Ave			Eastbound SW Boeckman Rd			Westbound SW Boeckman Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	23	17	40	1	2	3	16	21	37	40
PHF	0.00			0.52			0.25			0.57			0.67

By Movement	Northbound SW 95th Ave				Southbound SW 95th Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	21	0	2	23	1	0	0	1	0	0	16	16	40
PHF	0.00	0.00	0.00	0.00	0.58	0.00	0.25	0.52	0.25	0.00	0.00	0.25	0.00	0.00	0.57	0.57	0.67

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW 95th Ave				Southbound SW 95th Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	23	0	3	26	3	0	0	3	0	0	18	18	47
4:15 PM	0	0	0	0	20	0	2	22	2	0	0	2	0	0	18	18	42
4:30 PM	0	0	0	0	21	0	2	23	1	0	0	1	0	0	16	16	40
4:45 PM	0	0	0	0	17	0	0	17	1	0	0	1	0	0	10	10	28
5:00 PM	0	0	0	0	11	0	0	11	0	0	0	0	0	0	8	8	19

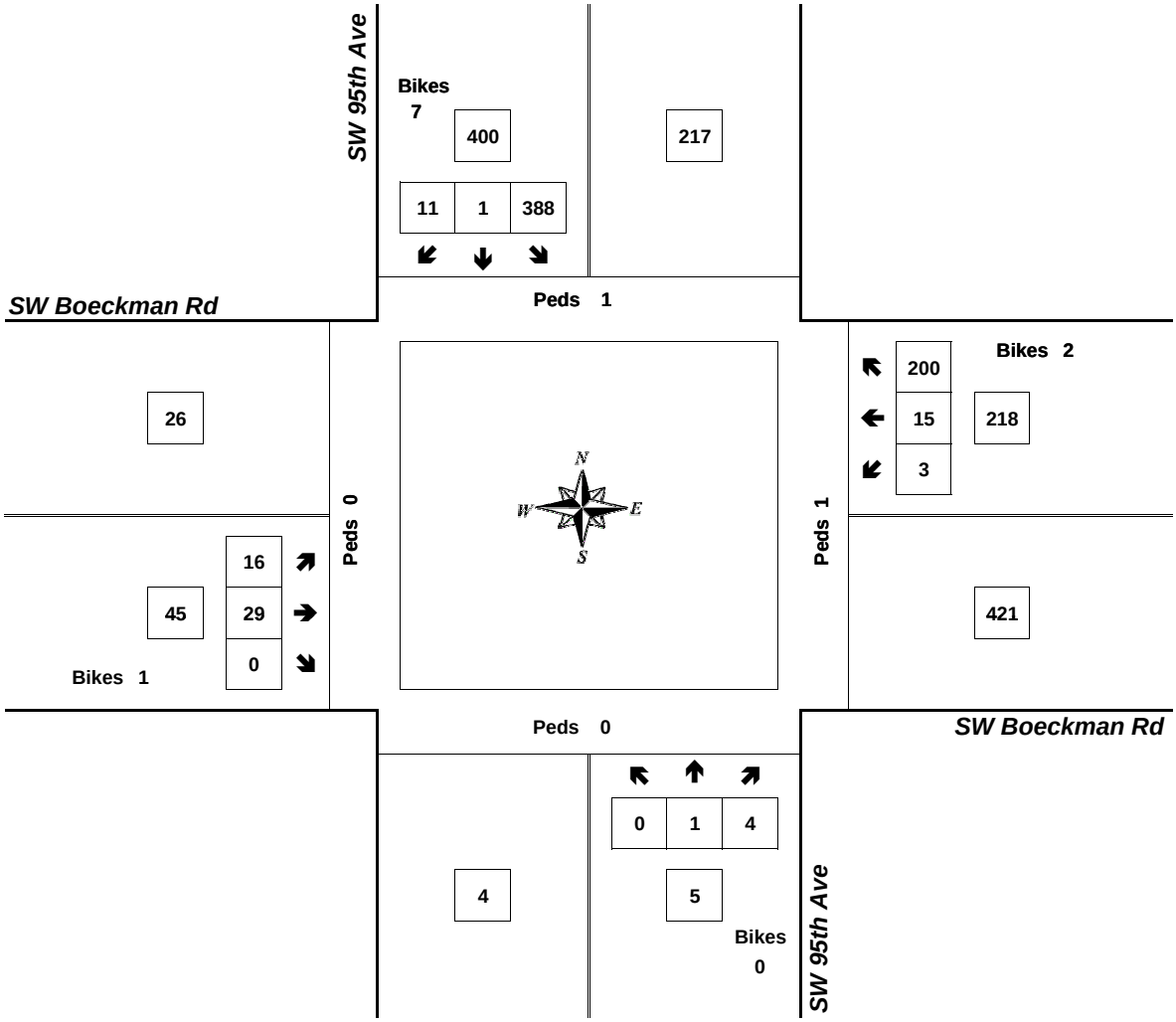
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

SW 95th Ave & SW Boeckman Rd

4:30 PM to 5:30 PM
Wednesday, June 07, 2017

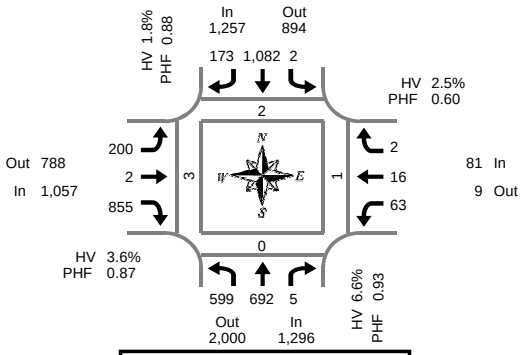


Approach	PHF	HV%	Volume
EB	0.59	2.2%	45
WB	0.77	7.3%	218
NB	0.42	0.0%	5
SB	0.88	5.8%	400
Intersection	0.89	6.0%	668

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:40 PM to 5:40 PM

SW Boones Ferry Rd & SW 95th Ave

Wednesday, June 07, 2017
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW 95th Ave				Westbound SW 95th Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	41	46	1	0	0	80	14	0	17	0	77	0	6	3	0	0	285	0	0	0	1
4:05 PM	51	60	0	0	1	72	17	0	18	0	99	0	4	0	0	0	322	0	0	0	0
4:10 PM	52	51	0	0	1	75	9	0	14	0	95	0	2	3	0	0	302	0	0	0	0
4:15 PM	51	57	2	0	0	79	5	1	14	0	66	0	1	1	0	0	276	1	0	0	0
4:20 PM	45	48	1	0	0	86	8	0	16	0	55	0	0	1	0	0	260	0	0	0	0
4:25 PM	43	44	0	0	1	110	16	0	9	0	59	0	4	0	0	0	286	0	0	0	0
4:30 PM	49	46	3	0	0	85	4	0	11	0	93	0	4	1	0	0	296	1	0	1	1
4:35 PM	35	53	0	0	0	77	17	1	15	0	83	0	6	3	0	0	289	0	0	0	0
4:40 PM	47	56	1	0	0	93	10	0	10	0	83	0	4	3	0	0	307	0	0	0	1
4:45 PM	51	57	1	0	0	72	14	0	25	0	74	0	5	1	2	0	302	1	0	1	0
4:50 PM	42	62	0	0	0	95	17	0	16	0	67	0	5	3	0	0	307	0	0	0	0
4:55 PM	42	59	2	0	0	97	22	0	12	0	67	0	3	1	0	0	305	0	0	0	1
5:00 PM	38	60	0	0	0	87	15	0	15	1	84	0	14	3	0	0	317	1	0	0	1
5:05 PM	49	51	0	0	0	82	12	0	17	0	90	0	10	1	0	0	312	0	0	0	0
5:10 PM	52	69	0	0	0	84	15	0	16	0	82	0	4	2	0	0	324	0	0	0	0
5:15 PM	58	54	0	0	0	82	14	0	17	0	79	1	3	0	0	0	307	0	0	0	0
5:20 PM	54	62	1	0	0	81	8	0	13	0	65	0	2	1	0	0	287	0	0	0	0
5:25 PM	52	51	0	1	1	119	14	0	18	1	36	1	5	1	0	0	298	0	0	0	0
5:30 PM	63	50	0	0	0	100	20	0	24	0	60	0	6	0	0	0	323	0	0	0	0
5:35 PM	51	61	0	0	1	90	12	0	17	0	68	0	2	0	0	0	302	0	0	0	0
5:40 PM	53	55	0	0	1	73	14	0	16	0	57	0	3	2	0	0	274	0	0	0	0
5:45 PM	65	54	0	0	0	86	12	0	17	1	51	0	0	2	0	0	288	0	0	0	0
5:50 PM	52	51	0	0	0	46	12	0	13	0	42	0	1	2	0	0	219	0	0	0	0
5:55 PM	56	48	1	0	0	73	14	0	12	0	34	0	2	0	0	0	240	0	0	0	0
Total Survey	1,192	1,305	13	1	6	2,024	315	2	372	3	1,666	2	96	34	2	0	7,028	4	0	2	5

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW 95th Ave				Westbound SW 95th Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	144	157	1	0	2	227	40	0	49	0	271	0	12	6	0	0	909	0	0	0	1
4:15 PM	139	149	3	0	1	275	29	1	39	0	180	0	5	2	0	0	822	1	0	0	0
4:30 PM	131	155	4	0	0	255	31	1	36	0	259	0	14	7	0	0	892	1	0	1	2
4:45 PM	135	178	3	0	0	264	53	0	53	0	208	0	13	5	2	0	914	1	0	1	1
5:00 PM	139	180	0	0	0	253	42	0	48	1	256	0	28	6	0	0	953	1	0	0	1
5:15 PM	164	167	1	1	1	282	36	0	48	1	180	2	10	2	0	0	892	0	0	0	0
5:30 PM	167	166	0	0	2	263	46	0	57	0	185	0	11	2	0	0	899	0	0	0	0
5:45 PM	173	153	1	0	0	205	38	0	42	1	127	0	3	4	0	0	747	0	0	0	0
Total Survey	1,192	1,305	13	1	6	2,024	315	2	372	3	1,666	2	96	34	2	0	7,028	4	0	2	5

Peak Hour Summary
4:40 PM to 5:40 PM

By Approach	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW 95th Ave				Westbound SW 95th Ave				Total
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	
Volume	1,296	2,000	3,296	1	1,257	894	2,151	0	1,057	788	1,845	2	81	9	90	0	3,691
%HV	6.6%				1.8%				3.6%				2.5%				4.0%
PHF	0.93				0.88				0.87				0.60				0.97

Pedestrians Crosswalk			
North	South	East	West
2	0	1	3

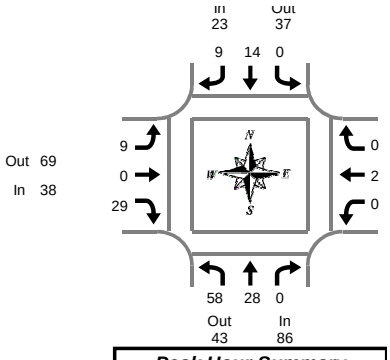
By Movement	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW 95th Ave				Westbound SW 95th Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	599	692	5	1,296	2	1,082	173	1,257	200	2	855	1,057	63	16	2	81	3,691
%HV	9.7%	4.0%	0.0%	6.6%	0.0%	1.3%	5.2%	1.8%	4.5%	0.0%	3.4%	3.6%	0.0%	12.5%	0.0%	2.5%	4.0%
PHF	0.89	0.94	0.42	0.93	0.25	0.88	0.80	0.88	0.85	0.50	0.83	0.87	0.56	0.57	0.25	0.60	0.97

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW 95th Ave				Westbound SW 95th Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	549	639	11	0	3	1,021	153	2	177	0	918	0	44	20	2	0	3,537	3	0	2	4
4:15 PM	544	662	10	0	1	1,047	155	2	176	1	903	0	60	20	2	0	3,581	4	0	2	4
4:30 PM	569	680	8	1	1	1,054	162	1	185	2	903	2	65	20	2	0	3,651	3	0	2	4
4:45 PM	605	691	4	1	3	1,062	177	0	206	2	829	2	62	15	2	0	3,658	2	0	1	2
5:00 PM	643	666	2	1	3	1,003	162	0	195	3	748	2	52	14	0	0	3,491	1	0	0	1

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



SW Boones Ferry Rd & SW 95th Ave

Wednesday, June 07, 2017
4:00 PM to 6:00 PM

Peak Hour Summary
4:40 PM to 5:40 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW 95th Ave				Westbound SW 95th Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	3	3	0	6	0	3	0	3	3	0	3	6	0	1	0	1	16
4:05 PM	9	3	0	12	0	1	0	1	0	0	4	4	0	0	0	0	17
4:10 PM	12	3	0	15	0	5	0	5	0	0	5	5	0	0	0	0	25
4:15 PM	6	4	0	10	0	5	0	5	1	0	3	4	0	0	0	0	19
4:20 PM	7	2	0	9	0	4	1	5	2	0	0	2	0	0	0	0	16
4:25 PM	3	2	0	5	0	3	2	5	0	0	4	4	0	0	0	0	14
4:30 PM	10	3	0	13	0	3	0	3	1	0	6	7	0	0	0	0	23
4:35 PM	9	4	0	13	0	2	1	3	0	0	1	1	0	0	0	0	17
4:40 PM	7	7	0	14	0	0	1	1	1	0	3	4	0	1	0	1	20
4:45 PM	4	8	0	12	0	3	0	3	1	0	2	3	0	0	0	0	18
4:50 PM	4	2	0	6	0	0	2	2	1	0	3	4	0	0	0	0	12
4:55 PM	5	2	0	7	0	3	2	5	1	0	4	5	0	0	0	0	17
5:00 PM	6	1	0	7	0	0	1	1	0	0	1	1	0	0	0	0	9
5:05 PM	4	1	0	5	0	1	1	2	0	0	4	4	0	0	0	0	11
5:10 PM	4	1	0	5	0	1	0	1	1	0	3	4	0	1	0	1	11
5:15 PM	8	1	0	9	0	4	0	4	1	0	5	6	0	0	0	0	19
5:20 PM	2	1	0	3	0	0	0	0	0	0	1	1	0	0	0	0	4
5:25 PM	2	2	0	4	0	0	1	1	0	0	1	1	0	0	0	0	6
5:30 PM	9	2	0	11	0	1	0	1	3	0	0	3	0	0	0	0	15
5:35 PM	3	0	0	3	0	1	1	2	0	0	2	2	0	0	0	0	7
5:40 PM	2	4	0	6	0	1	0	1	1	0	2	3	0	1	0	1	11
5:45 PM	4	0	0	4	0	2	0	2	0	0	3	3	0	0	0	0	9
5:50 PM	4	3	0	7	0	0	2	2	2	0	2	4	0	0	0	0	13
5:55 PM	0	3	0	3	0	2	0	2	1	0	4	5	0	0	0	0	10
Total Survey	127	62	0	189	0	45	15	60	20	0	66	86	0	4	0	4	339

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW 95th Ave				Westbound SW 95th Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	24	9	0	33	0	9	0	9	3	0	12	15	0	1	0	1	58
4:15 PM	16	8	0	24	0	12	3	15	3	0	7	10	0	0	0	0	49
4:30 PM	26	14	0	40	0	5	2	7	2	0	10	12	0	1	0	1	60
4:45 PM	13	12	0	25	0	6	4	10	3	0	9	12	0	0	0	0	47
5:00 PM	14	3	0	17	0	2	2	4	1	0	8	9	0	1	0	1	31
5:15 PM	12	4	0	16	0	4	1	5	1	0	7	8	0	0	0	0	29
5:30 PM	14	6	0	20	0	3	1	4	4	0	4	8	0	1	0	1	33
5:45 PM	8	6	0	14	0	4	2	6	3	0	9	12	0	0	0	0	32
Total Survey	127	62	0	189	0	45	15	60	20	0	66	86	0	4	0	4	339

Heavy Vehicle Peak Hour Summary
4:40 PM to 5:40 PM

By Approach	Northbound SW Boones Ferry Rd			Southbound SW Boones Ferry Rd			Eastbound SW 95th Ave			Westbound SW 95th Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	86	43	129	23	37	60	38	69	107	2	0	2	149
PHF	0.67			0.58			0.68			0.50			0.75

By Movement	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW 95th Ave				Westbound SW 95th Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	58	28	0	86	0	14	9	23	9	0	29	38	0	2	0	2	149
PHF	0.91	0.41	0.00	0.67	0.00	0.58	0.45	0.58	0.75	0.00	0.60	0.68	0.00	0.50	0.00	0.50	0.75

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

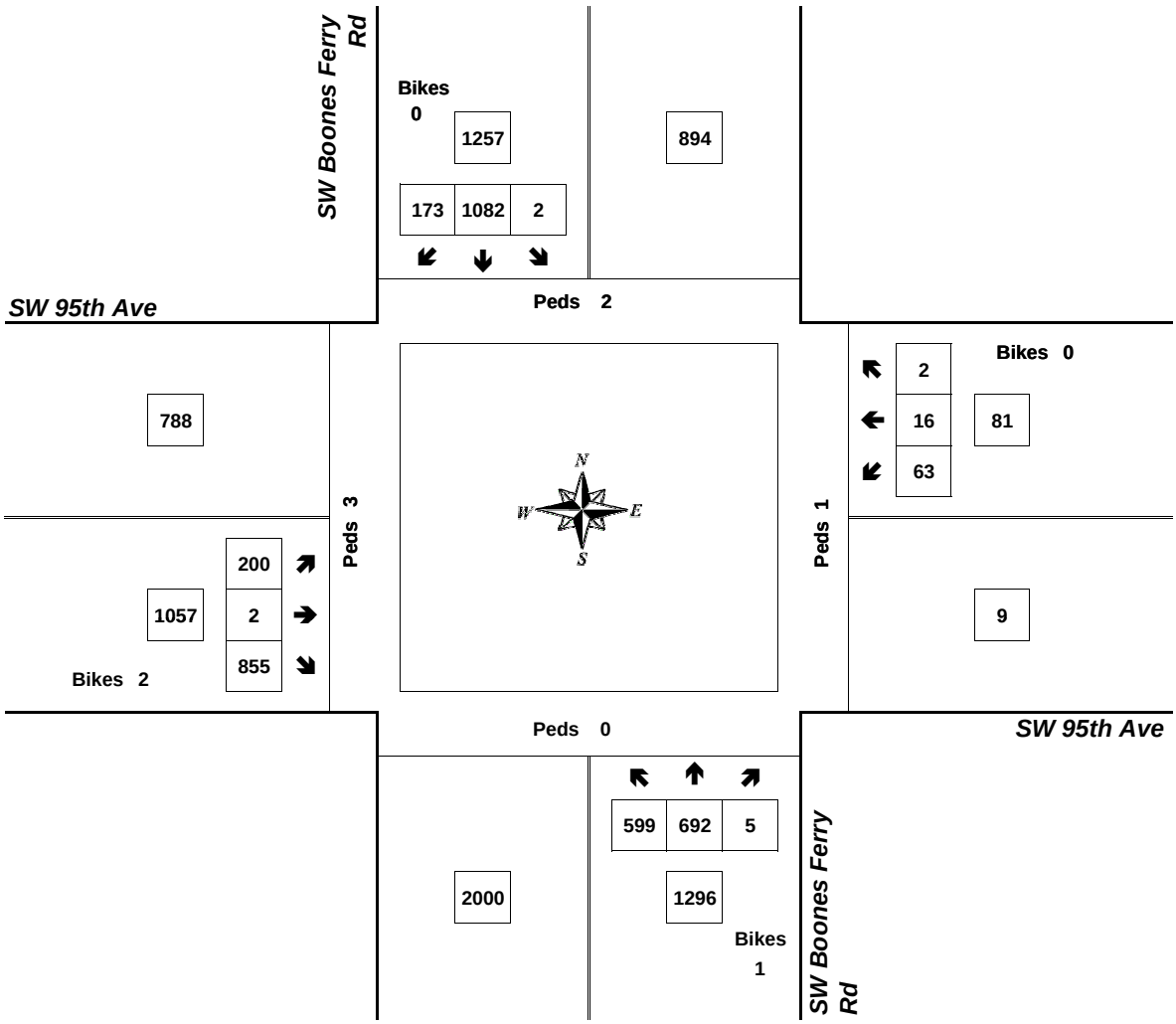
Interval Start Time	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW 95th Ave				Westbound SW 95th Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	79	43	0	122	0	32	9	41	11	0	38	49	0	2	0	2	214
4:15 PM	69	37	0	106	0	25	11	36	9	0	34	43	0	2	0	2	187
4:30 PM	65	33	0	98	0	17	9	26	7	0	34	41	0	2	0	2	167
4:45 PM	53	25	0	78	0	15	8	23	9	0	28	37	0	2	0	2	140
5:00 PM	48	19	0	67	0	13	6	19	9	0	28	37	0	2	0	2	125

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

SW Boones Ferry Rd & SW 95th Ave

4:40 PM to 5:40 PM
Wednesday, June 07, 2017

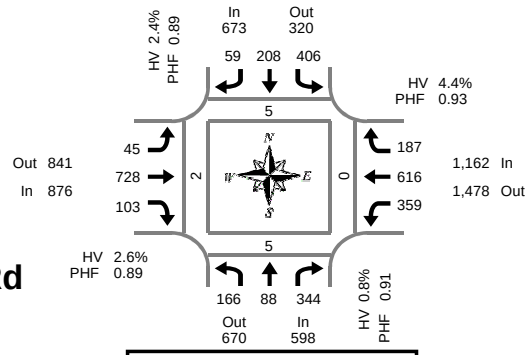


Approach	PHF	HV%	Volume
EB	0.87	3.6%	1,057
WB	0.60	2.5%	81
NB	0.93	6.6%	1,296
SB	0.88	1.8%	1,257
Intersection	0.97	4.0%	3,691

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



SW Boones Ferry Rd & SW Wilsonville Rd

Wednesday, June 07, 2017
4:00 PM to 6:00 PM

Peak Hour Summary
4:50 PM to 5:50 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	18	0	28	0	34	6	0	0	3	71	8	0	35	39	14	0	256	0	1	0	0
4:05 PM	9	7	28	0	52	18	6	0	4	71	7	0	20	40	12	0	274	1	0	0	0
4:10 PM	6	4	23	0	35	17	2	0	1	69	8	0	25	48	14	0	252	0	0	0	0
4:15 PM	12	9	30	0	30	9	8	0	1	60	9	0	38	42	14	1	262	2	0	0	0
4:20 PM	11	13	41	0	46	15	4	0	3	48	3	0	28	35	21	0	268	2	0	1	1
4:25 PM	22	11	31	0	39	14	1	0	3	76	13	0	16	33	14	0	273	3	0	0	0
4:30 PM	5	6	26	0	39	11	4	0	2	55	12	0	30	49	18	1	257	0	0	0	1
4:35 PM	17	11	33	2	31	7	1	0	3	62	8	0	37	42	13	3	265	1	0	0	2
4:40 PM	17	13	24	0	34	13	4	0	5	52	6	0	31	34	10	0	243	0	0	0	0
4:45 PM	11	8	19	0	42	13	5	0	0	58	4	0	28	55	9	0	252	0	0	0	1
4:50 PM	9	5	29	0	32	14	3	0	4	54	11	0	44	57	15	0	277	0	0	0	0
4:55 PM	10	3	42	0	23	14	6	0	3	59	8	0	26	47	15	0	256	0	0	0	0
5:00 PM	13	11	30	0	33	21	4	0	2	53	8	0	30	32	15	0	252	0	0	0	0
5:05 PM	8	7	22	0	48	14	9	0	5	73	10	0	24	62	16	0	298	0	0	0	0
5:10 PM	11	8	39	0	31	14	4	0	2	80	13	0	34	50	12	0	298	1	0	0	0
5:15 PM	19	7	23	0	39	22	5	0	4	43	7	0	32	42	14	0	257	1	0	0	0
5:20 PM	24	14	16	0	30	24	4	0	2	74	2	0	23	61	15	0	289	0	0	0	0
5:25 PM	18	6	34	0	39	13	7	0	6	74	6	0	30	57	18	0	308	0	2	0	0
5:30 PM	12	7	33	0	19	9	2	0	4	52	8	0	33	56	20	1	255	0	2	0	1
5:35 PM	15	11	23	0	47	22	4	0	7	39	12	0	23	42	19	0	264	0	1	0	1
5:40 PM	18	4	20	0	43	25	7	0	2	61	12	0	22	56	16	1	286	1	0	0	0
5:45 PM	9	5	33	0	22	16	4	0	4	66	6	0	38	54	12	0	269	2	0	0	0
5:50 PM	16	7	32	0	31	19	5	0	4	52	8	0	29	43	10	0	256	0	0	0	0
5:55 PM	12	9	27	0	38	12	6	0	1	31	4	0	31	38	12	0	221	2	0	0	1
Total Survey	322	186	686	2	857	362	105	0	75	1,433	193	0	707	1,114	348	7	6,388	16	6	1	8

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	33	11	79	0	121	41	8	0	8	211	23	0	80	127	40	0	782	1	1	0	0
4:15 PM	45	33	102	0	115	38	13	0	7	184	25	0	82	110	49	1	803	7	0	1	1
4:30 PM	39	30	83	2	104	31	9	0	10	169	26	0	98	125	41	4	765	1	0	0	3
4:45 PM	30	16	90	0	97	41	14	0	7	171	23	0	98	159	39	0	785	0	0	0	1
5:00 PM	32	26	91	0	112	49	17	0	9	206	31	0	88	144	43	0	848	1	0	0	0
5:15 PM	61	27	73	0	108	59	16	0	12	191	15	0	85	160	47	0	854	1	2	0	0
5:30 PM	45	22	76	0	109	56	13	0	13	152	32	0	78	154	55	2	805	1	3	0	2
5:45 PM	37	21	92	0	91	47	15	0	9	149	18	0	98	135	34	0	746	4	0	0	1
Total Survey	322	186	686	2	857	362	105	0	75	1,433	193	0	707	1,114	348	7	6,388	16	6	1	8

Peak Hour Summary
4:50 PM to 5:50 PM

By Approach	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	598	670	1,268	0	673	320	993	0	876	841	1,717	0	1,162	1,478	2,640	2	3,309	5	5	0	2
%HV	0.8%				2.4%				2.6%				4.4%				2.9%				
PHF	0.91				0.89				0.89				0.93				0.97				

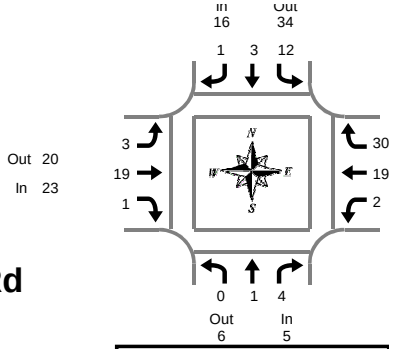
By Movement	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	166	88	344	598	406	208	59	673	45	728	103	876	359	616	187	1,162	3,309
%HV	0.0%	1.1%	1.2%	0.8%	3.0%	1.4%	1.7%	2.4%	6.7%	2.6%	1.0%	2.6%	0.6%	3.1%	16.0%	4.4%	2.9%
PHF	0.68	0.76	0.85	0.91	0.86	0.83	0.78	0.89	0.66	0.88	0.80	0.89	0.90	0.89	0.82	0.93	0.97

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	147	90	354	2	437	151	44	0	32	735	97	0	358	521	169	5	3,135	9	1	1	5
4:15 PM	146	105	366	2	428	159	53	0	33	730	105	0	366	538	172	5	3,201	9	0	1	5
4:30 PM	162	99	337	2	421	180	56	0	38	737	95	0	369	588	170	4	3,252	3	2	0	4
4:45 PM	168	91	330	0	426	205	60	0	41	720	101	0	349	617	184	2	3,292	3	5	0	3
5:00 PM	175	96	332	0	420	211	61	0	43	698	96	0	349	593	179	2	3,253	7	5	0	3

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



SW Boones Ferry Rd & SW Wilsonville Rd

Wednesday, June 07, 2017
4:00 PM to 6:00 PM

Peak Hour Summary
4:50 PM to 5:50 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	5	0	5	0	1	2	3	8
4:05 PM	0	1	1	2	5	1	1	7	0	5	0	5	0	4	1	5	19
4:10 PM	0	0	0	0	1	1	0	2	0	1	1	2	0	2	1	3	7
4:15 PM	0	1	0	1	1	0	0	1	0	2	0	2	1	4	4	9	13
4:20 PM	0	2	0	2	3	1	1	5	0	4	0	4	0	2	3	5	16
4:25 PM	0	0	0	0	1	0	0	1	0	1	1	2	0	2	5	7	10
4:30 PM	0	0	0	0	0	0	0	0	1	1	0	2	1	3	4	8	10
4:35 PM	0	0	1	1	0	0	0	0	0	1	0	1	0	1	3	4	6
4:40 PM	0	0	0	0	5	1	0	6	0	2	0	2	2	0	1	3	11
4:45 PM	0	1	2	3	1	0	0	1	0	1	0	1	0	2	2	4	9
4:50 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	4	5	6
4:55 PM	0	0	0	0	2	0	0	2	0	2	0	2	0	2	0	2	6
5:00 PM	0	0	0	0	2	0	0	2	0	0	0	0	1	1	5	7	9
5:05 PM	0	0	0	0	1	0	0	1	0	1	0	1	0	3	4	7	9
5:10 PM	0	0	1	1	2	1	0	3	0	3	0	3	0	2	3	5	12
5:15 PM	0	0	1	1	1	0	0	1	2	0	0	2	1	1	3	5	9
5:20 PM	0	1	0	1	1	0	0	1	0	3	0	3	0	4	2	6	11
5:25 PM	0	0	0	0	1	0	1	2	0	1	0	1	0	1	4	5	8
5:30 PM	0	0	0	0	0	1	0	1	1	3	0	4	0	0	2	2	7
5:35 PM	0	0	0	0	1	0	0	1	0	0	1	1	0	2	0	2	4
5:40 PM	0	0	0	0	0	1	0	1	0	4	0	4	0	0	1	1	6
5:45 PM	0	0	2	2	1	0	0	1	0	1	0	1	0	2	2	4	8
5:50 PM	0	0	0	0	1	0	0	1	0	0	0	0	1	2	1	4	5
5:55 PM	0	1	0	1	1	0	0	1	0	0	0	0	0	1	1	2	4
Total Survey	0	7	8	15	31	7	3	41	4	42	3	49	7	43	58	108	213

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	1	1	2	6	2	1	9	0	11	1	12	0	7	4	11	34
4:15 PM	0	3	0	3	5	1	1	7	0	7	1	8	1	8	12	21	39
4:30 PM	0	0	1	1	5	1	0	6	1	4	0	5	3	4	8	15	27
4:45 PM	0	1	2	3	3	0	0	3	0	4	0	4	0	5	6	11	21
5:00 PM	0	0	1	1	5	1	0	6	0	4	0	4	1	6	12	19	30
5:15 PM	0	1	1	2	3	0	1	4	2	4	0	6	1	6	9	16	28
5:30 PM	0	0	0	0	1	2	0	3	1	7	1	9	0	2	3	5	17
5:45 PM	0	1	2	3	3	0	0	3	0	1	0	1	1	5	4	10	17
Total Survey	0	7	8	15	31	7	3	41	4	42	3	49	7	43	58	108	213

Heavy Vehicle Peak Hour Summary
4:50 PM to 5:50 PM

By Approach	Northbound SW Boones Ferry Rd			Southbound SW Boones Ferry Rd			Eastbound SW Wilsonville Rd			Westbound SW Wilsonville Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	5	6	11	16	34	50	23	20	43	51	35	86	95
PHF	0.42			0.67			0.64			0.67			0.74

By Movement	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	1	4	5	12	3	1	16	3	19	1	23	2	19	30	51	95
PHF	0.00	0.25	0.50	0.42	0.60	0.38	0.25	0.67	0.38	0.68	0.25	0.64	0.50	0.68	0.63	0.67	0.74

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Boones Ferry Rd				Southbound SW Boones Ferry Rd				Eastbound SW Wilsonville Rd				Westbound SW Wilsonville Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	5	4	9	19	4	2	25	1	26	2	29	4	24	30	58	121
4:15 PM	0	4	4	8	18	3	1	22	1	19	1	21	5	23	38	66	117
4:30 PM	0	2	5	7	16	2	1	19	3	16	0	19	5	21	35	61	106
4:45 PM	0	2	4	6	12	3	1	16	3	19	1	23	2	19	30	51	96
5:00 PM	0	2	4	6	12	3	1	16	3	16	1	20	3	19	28	50	92

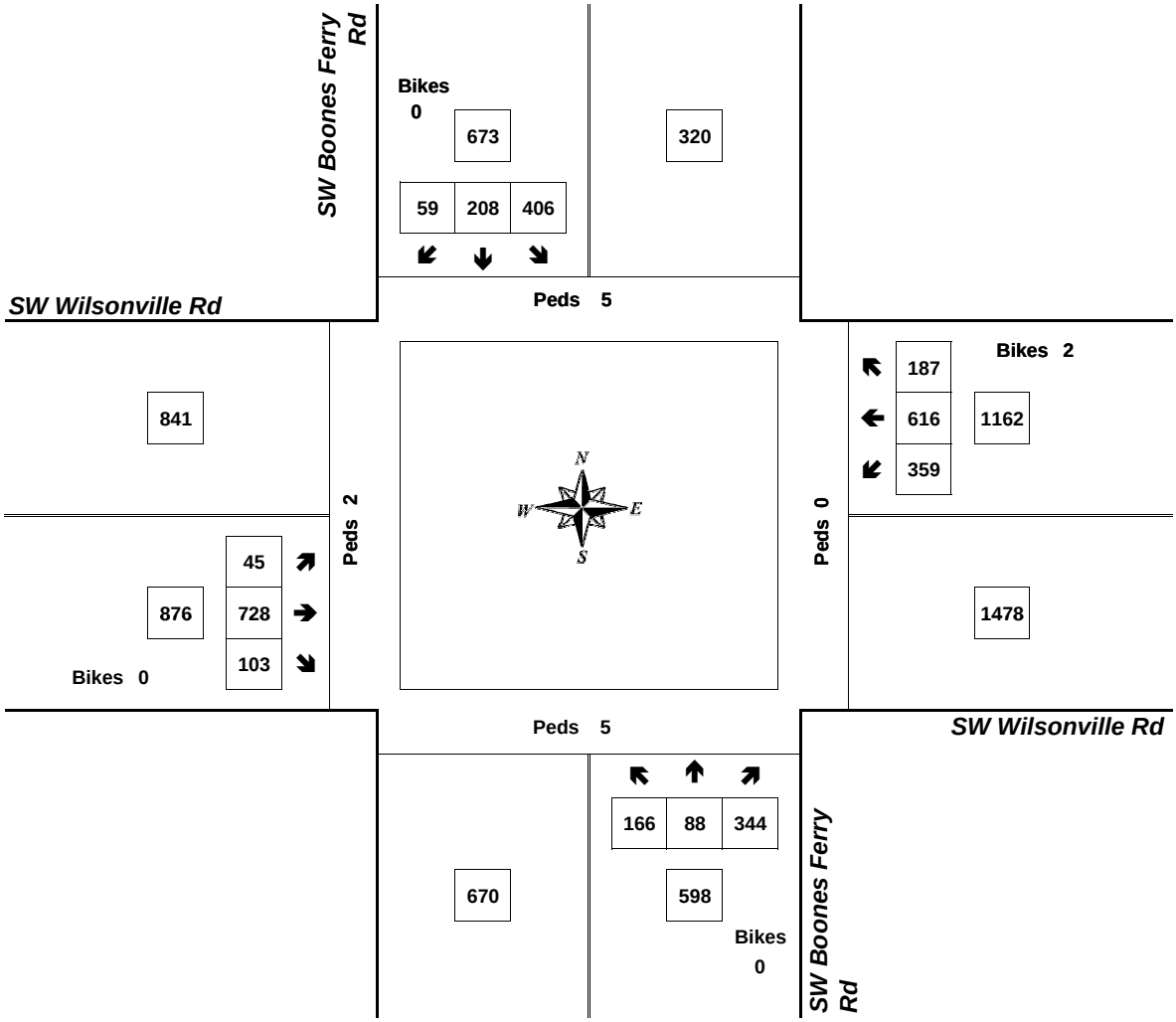
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

SW Boones Ferry Rd & SW Wilsonville Rd

4:50 PM to 5:50 PM
Wednesday, June 07, 2017

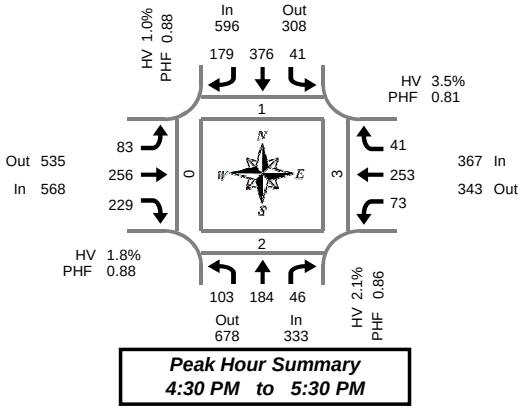


Approach	PHF	HV%	Volume
EB	0.89	2.6%	876
WB	0.93	4.4%	1,162
NB	0.91	0.8%	598
SB	0.89	2.4%	673
Intersection	0.97	2.9%	3,309

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:30 PM to 5:30 PM

SW Parkway Ave & SW Boeckman Rd

Tuesday, January 24, 2017
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Parkway Ave				Southbound SW Parkway Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	11	21	3	0	5	40	28	0	4	16	18	0	3	18	0	0	167	0	0	0	0
4:05 PM	10	5	2	0	2	36	10	0	7	22	18	0	4	16	5	0	137	0	0	0	0
4:10 PM	11	15	5	0	3	32	11	0	9	16	14	0	7	12	2	0	137	0	0	1	0
4:15 PM	10	13	5	0	2	30	14	0	7	20	23	0	4	17	3	0	148	0	0	0	0
4:20 PM	10	21	5	0	1	28	13	0	4	19	16	0	4	14	2	0	137	0	0	0	0
4:25 PM	8	12	4	0	3	32	10	0	0	20	17	0	4	12	1	0	123	0	0	0	0
4:30 PM	13	21	5	0	6	27	14	0	8	24	16	0	4	21	2	0	161	0	1	1	0
4:35 PM	7	15	7	0	2	35	15	0	8	22	16	0	4	18	2	0	151	0	0	0	0
4:40 PM	7	18	4	0	0	26	13	0	5	19	29	0	6	21	1	0	149	1	0	1	0
4:45 PM	8	14	4	0	3	28	13	0	3	27	20	0	3	14	5	0	142	0	0	0	0
4:50 PM	6	12	2	0	5	37	13	0	11	16	15	0	7	22	3	0	149	0	0	0	0
4:55 PM	8	12	4	0	3	22	14	0	7	18	19	0	4	15	3	0	129	0	1	1	0
5:00 PM	3	15	3	0	6	34	20	0	3	22	18	0	6	22	1	0	153	0	0	0	0
5:05 PM	8	14	2	0	3	40	15	0	6	17	19	1	12	25	6	0	167	0	0	0	0
5:10 PM	12	11	3	0	4	36	12	0	17	30	21	0	7	19	2	0	174	0	0	0	0
5:15 PM	10	21	3	0	2	32	16	0	2	23	26	0	5	32	5	0	177	0	0	0	0
5:20 PM	10	19	6	0	6	35	16	0	6	19	12	0	5	21	3	0	158	0	0	0	0
5:25 PM	11	12	3	0	1	24	18	0	7	19	18	0	10	23	8	0	154	0	0	0	0
5:30 PM	10	6	4	0	2	25	11	0	2	16	15	0	9	20	4	0	124	0	0	0	0
5:35 PM	6	16	5	0	5	23	14	0	3	10	29	0	5	11	2	0	129	0	0	0	0
5:40 PM	6	13	3	0	0	30	15	0	9	15	12	0	8	12	0	0	123	0	0	0	0
5:45 PM	17	10	4	0	2	17	7	0	4	16	18	0	3	12	1	0	111	0	0	0	0
5:50 PM	7	14	3	0	3	32	22	0	6	5	7	0	6	9	1	0	115	0	0	0	0
5:55 PM	4	12	4	0	3	29	9	0	12	13	11	0	10	15	4	1	126	0	0	1	0
Total Survey	213	342	93	0	72	730	343	0	150	444	427	1	140	421	66	1	3,441	1	2	5	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Parkway Ave				Southbound SW Parkway Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	32	41	10	0	10	108	49	0	20	54	50	0	14	46	7	0	441	0	0	1	0
4:15 PM	28	46	14	0	6	90	37	0	11	59	56	0	12	43	6	0	408	0	0	0	0
4:30 PM	27	54	16	0	8	88	42	0	21	65	61	0	14	60	5	0	461	1	1	2	0
4:45 PM	22	38	10	0	11	87	40	0	21	61	54	0	14	51	11	0	420	0	1	1	0
5:00 PM	23	40	8	0	13	110	47	0	26	69	58	1	25	66	9	0	494	0	0	0	0
5:15 PM	31	52	12	0	9	91	50	0	15	61	56	0	20	76	16	0	489	0	0	0	0
5:30 PM	22	35	12	0	7	78	40	0	14	41	56	0	22	43	6	0	376	0	0	0	0
5:45 PM	28	36	11	0	8	78	38	0	22	34	36	0	19	36	6	1	352	0	0	1	0
Total Survey	213	342	93	0	72	730	343	0	150	444	427	1	140	421	66	1	3,441	1	2	5	0

Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound SW Parkway Ave				Southbound SW Parkway Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	333	678	1,011	0	596	308	904	0	568	535	1,103	1	367	343	710	0	1,864	1	2	3	0
%HV	2.1%				1.0%				1.8%				3.5%				1.9%				
PHF	0.86				0.88				0.88				0.81				0.90				

By Movement	Northbound SW Parkway Ave				Southbound SW Parkway Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	103	184	46	333	41	376	179	596	83	256	229	568	73	253	41	367	1,864
%HV	1.9%	1.6%	4.3%	2.1%	2.4%	1.1%	0.6%	1.0%	1.2%	2.3%	1.3%	1.8%	2.7%	4.0%	2.4%	3.5%	1.9%
PHF	0.80	0.85	0.72	0.86	0.73	0.85	0.90	0.88	0.80	0.89	0.87	0.88	0.73	0.83	0.64	0.81	0.90

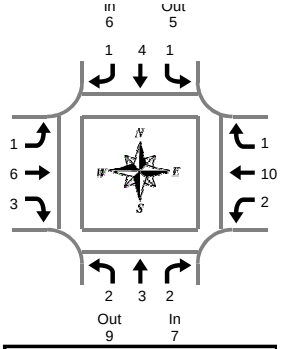
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Parkway Ave				Southbound SW Parkway Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	109	179	50	0	35	373	168	0	73	239	221	0	54	200	29	0	1,730	1	2	4	0
4:15 PM	100	178	48	0	38	375	166	0	79	254	229	1	65	220	31	0	1,783	1	2	3	0
4:30 PM	103	184	46	0	41	376	179	0	83	256	229	1	73	253	41	0	1,864	1	2	3	0
4:45 PM	98	165	42	0	40	366	177	0	76	232	224	1	81	236	42	0	1,779	0	1	1	0
5:00 PM	104	163	43	0	37	357	175	0	77	205	206	1	86	221	37	1	1,711	0	0	1	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740

Out 13
In 10



SW Parkway Ave & SW Boeckman Rd

Tuesday, January 24, 2017
4:00 PM to 6:00 PM

Peak Hour Summary
4:30 PM to 5:30 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Parkway Ave				Southbound SW Parkway Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	1	1	2	0	0	2	0	2	0	2	5
4:05 PM	0	0	0	0	0	0	0	0	0	4	1	5	0	0	1	1	6
4:10 PM	0	1	0	1	0	1	0	1	0	0	0	0	1	2	0	3	5
4:15 PM	1	1	0	2	0	0	1	1	0	0	0	0	0	0	0	0	3
4:20 PM	0	2	0	2	0	0	1	1	0	2	0	2	0	2	0	2	7
4:25 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	1	0	1	3
4:30 PM	1	0	0	1	1	0	0	1	0	3	1	4	0	2	0	2	8
4:35 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	4	0	4	5
4:40 PM	0	0	0	0	0	1	0	1	0	0	1	1	1	0	0	1	3
4:45 PM	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	2
4:50 PM	0	0	1	1	0	0	1	1	0	0	0	0	0	1	0	1	3
4:55 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
5:00 PM	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	2
5:05 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	1	2	3
5:10 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
5:15 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	1	0	1	3
5:20 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	2
5:25 PM	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	1	2
5:30 PM	0	0	0	0	0	1	0	1	0	2	0	2	0	0	0	0	3
5:35 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	2
5:40 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
5:45 PM	1	1	0	2	0	0	0	0	0	0	0	0	0	1	0	1	3
5:50 PM	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1	2
5:55 PM	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	1	2
Total Survey	4	9	3	16	1	8	4	13	4	16	4	24	5	18	3	26	79

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Parkway Ave				Southbound SW Parkway Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	1	0	1	0	1	1	2	2	4	1	7	1	4	1	6	16
4:15 PM	1	4	0	5	0	1	2	3	0	2	0	2	0	3	0	3	13
4:30 PM	1	1	0	2	1	1	0	2	0	3	2	5	1	6	0	7	16
4:45 PM	0	1	1	2	0	0	1	1	1	0	1	2	0	1	0	1	6
5:00 PM	0	0	0	0	0	2	0	2	0	3	0	3	0	1	1	2	7
5:15 PM	1	1	1	3	0	1	0	1	0	0	0	0	1	2	0	3	7
5:30 PM	0	0	0	0	0	2	0	2	0	4	0	4	0	0	1	1	7
5:45 PM	1	1	1	3	0	0	0	0	1	0	0	1	2	1	0	3	7
Total Survey	4	9	3	16	1	8	4	13	4	16	4	24	5	18	3	26	79

Heavy Vehicle Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound SW Parkway Ave			Southbound SW Parkway Ave			Eastbound SW Boeckman Rd			Westbound SW Boeckman Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	7	9	16	6	5	11	10	13	23	13	9	22	36
PHF	0.58			0.75			0.50			0.46			0.56

By Movement	Northbound SW Parkway Ave				Southbound SW Parkway Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	2	3	2	7	1	4	1	6	1	6	3	10	2	10	1	13	36
PHF	0.50	0.38	0.50	0.58	0.25	0.50	0.25	0.75	0.25	0.50	0.38	0.50	0.50	0.42	0.25	0.46	0.56

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Parkway Ave				Southbound SW Parkway Ave				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	2	7	1	10	1	3	4	8	3	9	4	16	2	14	1	17	51
4:15 PM	2	6	1	9	1	4	3	8	1	8	3	12	1	11	1	13	42
4:30 PM	2	3	2	7	1	4	1	6	1	6	3	10	2	10	1	13	36
4:45 PM	1	2	2	5	0	5	1	6	1	7	1	9	1	4	2	7	27
5:00 PM	2	2	2	6	0	5	0	5	1	7	0	8	3	4	2	9	28

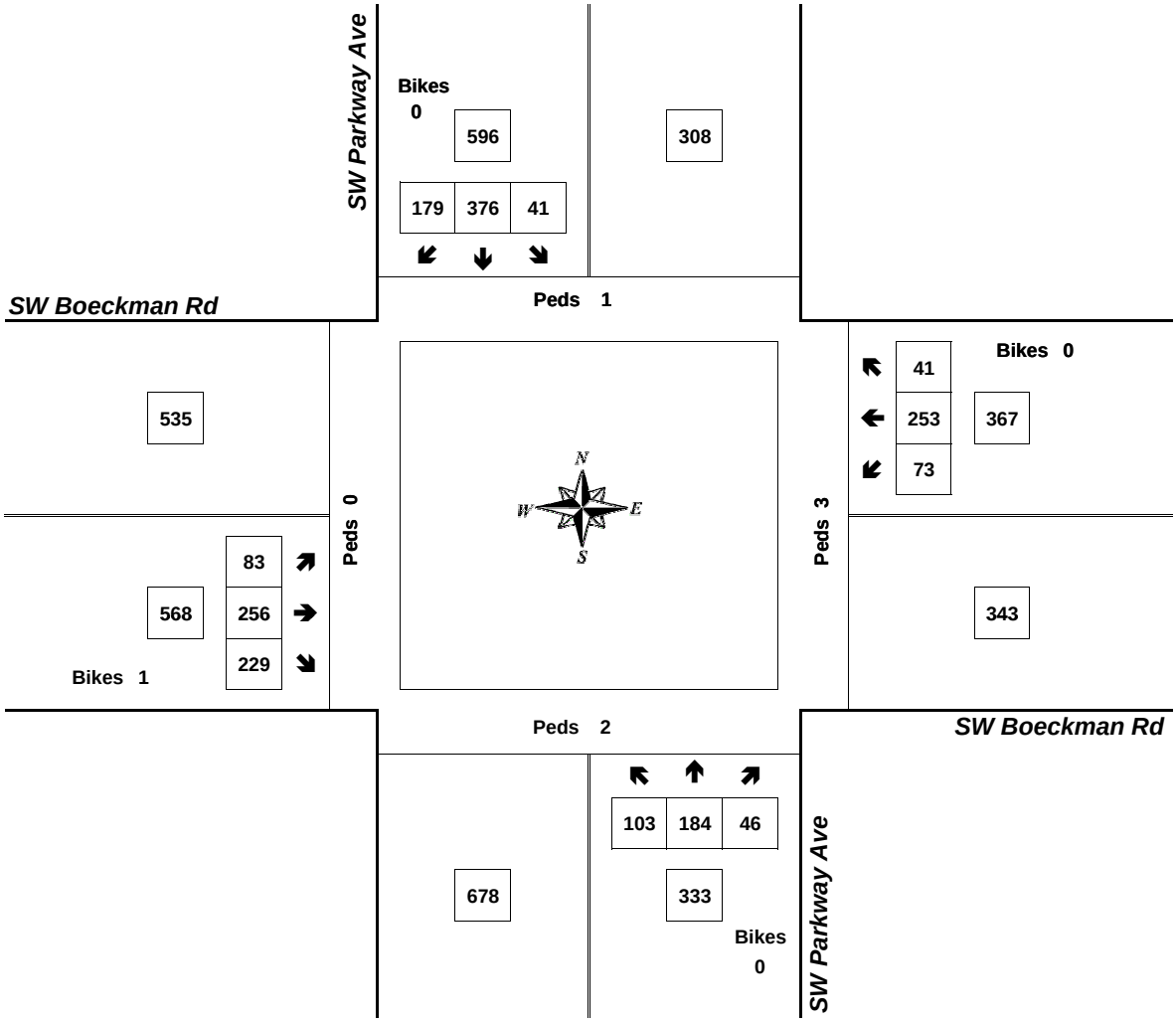
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

SW Parkway Ave & SW Boeckman Rd

4:30 PM to 5:30 PM
Tuesday, January 24, 2017



Approach	PHF	HV%	Volume
EB	0.88	1.8%	568
WB	0.81	3.5%	367
NB	0.86	2.1%	333
SB	0.88	1.0%	596
Intersection	0.90	1.9%	1,864

Count Period: 4:00 PM to 6:00 PM

Level of Service Descriptions

TRAFFIC LEVELS OF SERVICE

Analysis of traffic volumes is useful in understanding the general nature of traffic in an area, but by itself indicates neither the ability of the street network to carry additional traffic nor the quality of service afforded by the street facilities. For this, the concept of level of service has been developed to subjectively describe traffic performance. Level of service can be measured at intersections and along key roadway segments.

Levels of service categories are similar to report card ratings for traffic performance. Intersections are typically the controlling bottlenecks of traffic flow and the ability of a roadway system to carry traffic efficiently is generally diminished in their vicinities. Levels of Service A, B and C indicate conditions where traffic moves without significant delays over periods of peak travel demand. Level of service D and E are progressively worse peak hour operating conditions and F conditions represent where demand exceeds the capacity of an intersection. Most urban communities set level of service D as the minimum acceptable level of service for peak hour operation and plan for level of service C or better for all other times of the day. The Highway Capacity Manual provides level of service calculation methodology for both intersections and arterials[1]. The following two sections provide interpretations of the analysis approaches.

[1] *2000 Highway Capacity Manual*, Transportation Research Board, Washington D.C., 2000, Chapter 16 and 17.

UNSIGNALIZED INTERSECTIONS (Two-Way Stop Controlled)

Unsignalized intersection level of service is reported for the major street and minor street (generally, left turn movements). The method assesses available and critical gaps in the traffic stream which make it possible for side street traffic to enter the main street flow. The 2010 Highway Capacity Manual describes the detailed methodology. It is not unusual for an intersection to experience level of service E or F conditions for the minor street left turn movement. It should be understood that, often, a poor level of service is experienced by only a few vehicles and the intersection as a whole operates acceptably.

Unsignalized intersection levels of service are described in the following table.

Level-of-Service Criteria: Automobile Mode

Control Delay (s/vehicle)	**LOS by Volume-to-Capacity Ratio**	
	***v/c* ≤ 1.0**	***v/c* > 1.0**
0-10	A	F
>10-15	B	F
>15-25	C	F
>25-35	D	F
>35-50	E	F
>50	F	F

Note: The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole

SIGNALIZED INTERSECTIONS

For signalized intersections, level of service is evaluated based upon average vehicle delay experienced by vehicles entering an intersection. Control delay (or signal delay) includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. In previous versions of this chapter of the HCM (1994 and earlier), delay included only stopped delay. As delay increases, the level of service decreases. Calculations for signalized and unsignalized intersections are different due to the variation in traffic control. The 2000 Highway Capacity Manual provides the basis for these calculations.

Level of Service	Delay (secs.)	Description
A	<10.00	**Free Flow/Insignificant Delays:** No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication. Most vehicles do not stop at all. Progression is extremely favorable and most vehicles arrive during the green phase.
B	10.1-20.0	**Stable Operation/Minimal Delays:** An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles. This level generally occurs with good progression, short cycle lengths, or both.
C	20.1-35.0	**Stable Operation/Acceptable Delays:** Major approach phases fully utilized. Most drivers feel somewhat restricted. Higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, and the number of vehicles stopping is significant.
D	35.1-55.0	**Approaching Unstable/Tolerable Delays:** The influence of congestion becomes more noticeable. Drivers may have to wait through more than one red signal indication. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. The proportion of vehicles not stopping declines, and individual cycle failures are noticeable.
E	55.1-80.0	**Unstable Operation/Significant Delays:** Volumes at or near capacity. Vehicles may wait though several signal cycles. Long queues form upstream from intersection. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are a frequent occurrence.
F	>80.0	**Forced Flow/Excessive Delays:** Represents jammed conditions. Queues may block upstream intersections. This level occurs when arrival flow rates exceed intersection capacity, and is considered to be unacceptable to most drivers. Poor progression, long cycle lengths, and v/c ratios approaching 1.0 may contribute to these high delay levels.

Source: *2000 Highway Capacity Manual*, Transportation Research Board, Washington D.C.

Trip Generation Summary

Vistro File: S:\...\DW Fritz (Project Trip Distribution).vistro
Report File: S:\...\Project Trips Phase 1.pdf

Scenario 2 Phase 1 Trips
7/20/2017

Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	SW Boones Ferry Road/SW 95th Avenue	10	0	0	0	0	2	3	0	17	0	0	0	32

ID	Intersection Name	Southwestbound			Northwestbound		Southeastbound		Total Volume
		Left	Thru	Right	Thru	Right	Thru	Right	
2	SW Elligsen/I-5 SB Ramp	0	0	10	0	0	17	0	27

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Boeckman Rd/SW 95th Avenue	0	0	0	0	0	12	20	18	0	0	10	0	60

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Boeckman Road/SW Parkway Avenue	0	0	0	0	0	0	0	18	0	0	10	0	28

ID	Intersection Name	Northbound			Eastbound			Westbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
5	SW Wilsonville Road/SW Boones Ferry Road	0	0	0	0	13	0	0	8	0	0	0	0	21

ID	Intersection Name	Southbound			Eastbound		Westbound		Total Volume
		Left	Thru	Right	Thru	Right	Left	Thru	
6	SW Wilsonville Road/I-5 SB Ramp	0	0	0	0	13	0	8	21

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
12	West Driveway	29	0	0	0	0	0	0	0	18	0	0	0	47

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
13	East Driveway	0	0	38	0	0	0	0	0	0	22	0	0	60

DW Frtiz TIA

Vistro File: S:\...\DW Fritz (Project Trip Distribution).vistro
Report File: S:\...\Project Trips Phase 2.pdf

Scenario 3 Phase 2 Trips
7/20/2017

Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	SW Boones Ferry Road/SW 95th Avenue	15	0	0	0	0	3	5	0	23	0	0	0	46

ID	Intersection Name	Southwestbound			Northwestbound		Southeastbound		Total Volume
		Left	Thru	Right	Thru	Right	Thru	Right	
2	SW Elligsen/I-5 SB Ramp	0	0	15	0	0	23	0	38

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Boeckman Rd/SW 95th Avenue	0	0	0	0	0	18	28	21	0	0	15	0	82

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Boeckman Road/SW Parkway Avenue	0	0	0	0	0	0	0	21	0	0	15	0	36

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
5	SW Wilsonville Road/SW Boones Ferry Road	0	0	0	0	0	0	0	18	0	0	12	0	30

ID	Intersection Name	Southbound			Eastbound		Westbound		Total Volume
		Left	Thru	Right	Thru	Right	Left	Thru	
6	SW Wilsonville Road/I-5 SB Ramp	0	0	0	0	18	0	12	30

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
14	West Driveway	41	0	0	0	0	0	0	0	27	0	0	0	68

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
15	East Driveway	0	0	49	0	0	0	0	0	0	33	0	0	82

City of Wilsonville Stage II List

DKS

Updated by D. Pauly 3.13.17

Stage II Approved									
Project	Land Use	Status	Size	Total PM Peak Trips	Trip Allocation Percentage		Net New (Primary + Diverted) PM Peak Hour Trips not yet active		
					Internal	Pass-By	In	Out	Total
Ash Meadows	MFDU	Built	14 units				9	4	13
Ash Park Subdivision	Residential	Not built	12 units				8	4	12
Hydro-Temp: Recent agreement with the City, the project is vested and so are the traffic trips	Office/Flex-Space	Not built	60.8 KSF				44	46	90
Mercedes Benz (Phase 2)	Auto Dealership	Not built					20	26	46
Renaissance Boat Club (Abele Zone Change TIS)	Residential (Single Family)	25 homes sold and occupied	33 Lots				5	3	8
Shredding Systems (SQFT does not including paint canopy and another canopy)	Industrial/Commercial	Not built	66.8 KSF				20	46	66
Town Center Ph III *and trip dedication to Miller Paint store Uses marked with "*" have not been built and PM peak hr trip sum exceeds remaining vested trip level by 2 trips. It has yet to be determined how to allocate trips between remaining buildings.*	*Fast Food (Pad 2)	Not built	2.5 KSF				18	16	34*
	*High Turnover Restaurant (Pad 1)	Not built	7.5 KSF				24	17	41*
	*Miller Paint store	Not built	5.0 KSF				6	6	12*
	Remaining Approved Total								85
Wilsonville Road Business Park Phase II	Phase 2 - office (2-story building on west parcel)	Partially Built	21.7 KSF				15	71	86
Clackamas Community College Pole Training Yard Expansion	Educational	Not built		0			0	0	0
Universal Health Services	Mental Health Facility	Not built	62K						
Meridian Creek Middle School (formerly Advance Road Middle School)	Educational	Under construction	118K						
14-Lot Single-Family Subdivision at 28500 and 28530 SW Canyon Creek Rd. South	Residential	Under construction	14				9	5	14
SORT Bionergy **Minimal impact, no PM Peak indicated in traffic impact analysis*	Industrial	Not built					*	*	*
Charbonneau Range 40-lot Subdivision	Residential	Approved	40 lots				29	17	46

Stage II Approved – Villebois													
Project	Phase	Status	Land Use					Total PM Peak Trips	Trip Allocation Percentage		Net New (Primary + Diverted) PM Peak Hour Trips not yet active		
			SF	Town.	Apt.	Retail	School		Internal	Pass-By	In	Out	Total
North (Entirety)	Residential	Partially Built, 304 homes sold and occupied	440		10						91	53	143
Grande Pointe (Phase 7 South)	Grande Pointe	Partially Built, 34 homes sold and occupied	100	-	-	-	-	114	4		42	24	66
East	Residential	Partially Built, 394 homes (367 single family and 27 row homes) sold and occupied	576	42							128	89	217
Central	Residential	Partially Built, 490 homes (47 single family, 78 condo/row homes, 365 apartments) occupied	75	459	449	3 KSF					185	94	279

Pending Projects for Which Traffic Analysis has been completed (except Villebois)										
Project	Land Use	Status	Size	Total PM Peak	Trip Allocation Percentage			Net New (Primary) PM Peak Hour Trips		
					Internal	Pass-By	Diverted	In	Out	Total
Mercedes Benz Expansion	Commercial	Land Use Application Not Submitted	53 KSF					18	18	36
Marion Carpet	Industrial	Under Review	30.5 KSF					11	24	35

HCM Analysis – Existing

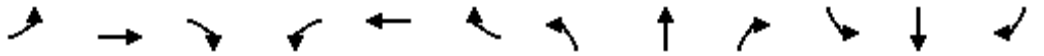
HCM Signalized Intersection Capacity Analysis
1: Boones Ferry Rd & 95th Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	2	855	63	16	2	599	754	5	2	1082	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		1.00	0.88	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85	1.00	0.98		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1737	2734	1805	1686		3183	3468		1805	3574	1497
Flt Permitted		0.72	1.00	0.43	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1304	2734	809	1686		3183	3468		1805	3574	1497
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)	206	2	881	65	16	2	618	777	5	2	1115	178
RTOR Reduction (vph)	0	0	18	0	2	0	0	0	0	0	0	89
Lane Group Flow (vph)	0	208	863	65	16	0	618	782	0	2	1115	89
Confl. Peds. (#/hr)	2					2	3		1	1		3
Confl. Bikes (#/hr)			2						1			
Heavy Vehicles (%)	4%	0%	3%	0%	12%	0%	10%	4%	0%	0%	1%	5%
Turn Type	Perm	NA	pm+ov	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								2
Actuated Green, G (s)		21.5	49.8	21.5	21.5		28.3	70.3		1.2	43.2	43.2
Effective Green, g (s)		21.5	49.8	21.5	21.5		28.3	70.3		1.2	43.2	43.2
Actuated g/C Ratio		0.20	0.47	0.20	0.20		0.27	0.67		0.01	0.41	0.41
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		267	1400	165	345		857	2321		20	1470	615
v/s Ratio Prot			c0.17		0.01		c0.19	0.23		0.00	c0.31	
v/s Ratio Perm		c0.16	0.15	0.08								0.06
v/c Ratio		0.78	0.62	0.39	0.05		0.72	0.34		0.10	0.76	0.14
Uniform Delay, d1		39.5	20.5	36.1	33.5		34.8	7.4		51.4	26.4	19.3
Progression Factor		1.00	1.00	1.00	1.00		1.10	0.62		1.00	1.00	1.00
Incremental Delay, d2		13.4	0.8	1.6	0.1		4.0	0.3		2.2	2.3	0.1
Delay (s)		52.9	21.3	37.7	33.6		42.4	4.9		53.6	28.7	19.4
Level of Service		D	C	D	C		D	A		D	C	B
Approach Delay (s)		27.3			36.8			21.4			27.5	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: I-5 SB On Ramp/I-5 SB Off Ramp & Boones Ferry Road/Elligsen Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1099	901	0	723	406	0	0	0	548	0	635
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0				4.5	4.5	4.5
Lane Util. Factor		0.95	1.00		0.95	1.00				0.95	0.95	1.00
Frpb, ped/bikes		1.00	0.99		1.00	0.98				1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00				1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95	0.95	1.00
Satd. Flow (prot)		3539	1564		3471	1580				1649	1649	1495
Flt Permitted		1.00	1.00		1.00	1.00				0.95	0.95	1.00
Satd. Flow (perm)		3539	1564		3471	1580				1649	1649	1495
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1169	959	0	769	432	0	0	0	583	0	676
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	87
Lane Group Flow (vph)	0	1169	959	0	769	432	0	0	0	291	292	589
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)			1			5						
Heavy Vehicles (%)	0%	2%	2%	0%	4%	0%	0%	0%	0%	4%	0%	8%
Turn Type		NA	Free		NA	Free				Split	NA	Prot
Protected Phases		2			6					4	4	4
Permitted Phases			Free			Free						
Actuated Green, G (s)		50.0	105.0		50.0	105.0				45.5	45.5	45.5
Effective Green, g (s)		51.0	105.0		51.0	105.0				45.5	45.5	45.5
Actuated g/C Ratio		0.49	1.00		0.49	1.00				0.43	0.43	0.43
Clearance Time (s)		5.0			5.0					4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1718	1564		1685	1580				714	714	647
v/s Ratio Prot		c0.33			0.22					0.18	0.18	c0.39
v/s Ratio Perm			0.61			0.27						
v/c Ratio		0.68	0.61		0.46	0.27				0.41	0.41	0.91
Uniform Delay, d1		20.7	0.0		17.8	0.0				20.5	20.5	27.9
Progression Factor		0.86	1.00		1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2		1.6	1.3		0.9	0.4				0.4	0.4	17.1
Delay (s)		19.4	1.3		18.7	0.4				20.9	20.9	44.9
Level of Service		B	A		B	A				C	C	D
Approach Delay (s)		11.2			12.1			0.0			33.8	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

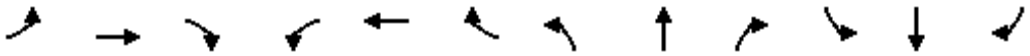
HCM Signalized Intersection Capacity Analysis
3: Boeckman Rd & 95th Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	29	0	3	15	200	0	1	4	388	1	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.88		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1700	1900		1805	1900	1459		1655		1719	1369	
Flt Permitted	1.00	1.00		0.74	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (perm)	1789	1900		1398	1900	1459		1655		1719	1369	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	18	33	0	3	17	225	0	1	4	436	1	12
RTOR Reduction (vph)	0	0	0	0	0	167	0	4	0	0	7	0
Lane Group Flow (vph)	18	33	0	3	17	58	0	1	0	436	6	0
Confl. Peds. (#/hr)	1					1			1	1		
Confl. Bikes (#/hr)			1			2						7
Heavy Vehicles (%)	6%	0%	0%	0%	0%	8%	0%	0%	0%	5%	0%	18%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases	2			6		6						
Actuated Green, G (s)	3.9	2.5		20.6	14.7	14.7		0.8		22.1	22.1	
Effective Green, g (s)	3.9	2.5		20.6	14.7	14.7		0.8		22.1	22.1	
Actuated g/C Ratio	0.07	0.04		0.36	0.26	0.26		0.01		0.39	0.39	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0		2.5		2.5	2.5	
Lane Grp Cap (vph)	120	83		602	490	376		23		666	530	
v/s Ratio Prot	c0.00	c0.02		0.00	0.01			c0.00		c0.25	0.00	
v/s Ratio Perm	0.01			0.00		c0.04						
v/c Ratio	0.15	0.40		0.00	0.03	0.15		0.05		0.65	0.01	
Uniform Delay, d1	23.7	26.5		11.6	15.8	16.3		27.7		14.3	10.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.4	3.1		0.0	0.0	0.2		0.6		2.1	0.0	
Delay (s)	24.2	29.6		11.7	15.9	16.5		28.3		16.4	10.7	
Level of Service	C	C		B	B	B		C		B	B	
Approach Delay (s)		27.7			16.4			28.3			16.2	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	57.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Parkway Ave & Boeckman Rd

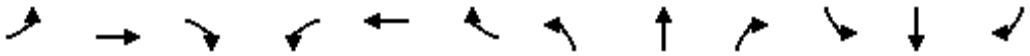


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	256	229	73	253	41	103	184	46	41	376	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.98		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1717		1752	1788		1770	1791		1766	1790	
Flt Permitted	0.37	1.00		0.14	1.00		0.11	1.00		0.55	1.00	
Satd. Flow (perm)	696	1717		261	1788		213	1791		1020	1790	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	92	284	254	81	281	46	114	204	51	46	418	199
RTOR Reduction (vph)	0	34	0	0	6	0	0	9	0	0	17	0
Lane Group Flow (vph)	92	504	0	81	321	0	114	246	0	46	600	0
Confl. Peds. (#/hr)	1		2	2		1			3	3		
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	1%	2%	1%	3%	4%	2%	2%	2%	4%	2%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	35.1	28.8		34.1	28.3		40.9	35.0		37.3	33.2	
Effective Green, g (s)	35.1	28.8		34.1	28.3		40.9	35.0		37.3	33.2	
Actuated g/C Ratio	0.39	0.32		0.38	0.31		0.45	0.39		0.41	0.37	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.5		4.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	345	545		193	557		197	691		453	655	
v/s Ratio Prot	0.02	c0.29		c0.03	0.18		c0.04	0.14		0.00	c0.34	
v/s Ratio Perm	0.08			0.13			0.22			0.04		
v/c Ratio	0.27	0.92		0.42	0.58		0.58	0.36		0.10	0.92	
Uniform Delay, d1	18.6	29.9		21.2	26.2		19.3	19.8		16.2	27.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	21.6		1.5	1.4		4.1	0.3		0.1	17.5	
Delay (s)	19.0	51.5		22.7	27.6		23.3	20.1		16.3	44.9	
Level of Service	B	D		C	C		C	C		B	D	
Approach Delay (s)		46.7			26.6			21.1			42.9	
Approach LOS		D			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	90.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Boones Ferry Rd & Wilsonville Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	728	103	449	656	207	166	88	344	406	208	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0		5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.91		0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1687	3100		3467	3600	1348	1805	4600	1599	4000	1809	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1687	3100		3467	3600	1348	1805	4600	1599	4000	1809	
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)	46	751	106	463	676	213	171	91	355	419	214	61
RTOR Reduction (vph)	0	15	0	0	0	81	0	0	48	0	10	0
Lane Group Flow (vph)	46	842	0	463	676	132	171	91	307	419	265	0
Confl. Peds. (#/hr)	5		5	5		5	2					2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	7%	3%	1%	1%	3%	16%	0%	1%	1%	3%	1%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		8	8	1	4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	7.0	36.4		18.6	48.0	48.0	15.2	15.2	33.8	19.8	19.8	
Effective Green, g (s)	7.0	37.4		18.6	49.0	49.0	15.2	15.2	33.8	19.8	19.8	
Actuated g/C Ratio	0.06	0.34		0.17	0.45	0.45	0.14	0.14	0.31	0.18	0.18	
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)	2.5	0.5		2.5	4.3	4.3	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	107	1054		586	1603	600	249	635	564	720	325	
v/s Ratio Prot	0.03	c0.27		c0.13	0.19		c0.09	0.02	0.09	0.10	c0.15	
v/s Ratio Perm						0.10			0.10			
v/c Ratio	0.43	0.80		0.79	0.42	0.22	0.69	0.14	0.54	0.58	0.82	
Uniform Delay, d1	49.6	32.9		43.8	20.8	18.8	45.1	41.7	31.7	41.3	43.3	
Progression Factor	1.00	1.00		1.25	0.81	0.60	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.0	6.4		6.4	0.8	0.8	7.0	0.1	0.9	1.0	14.2	
Delay (s)	51.6	39.3		61.3	17.5	12.1	52.1	41.8	32.5	42.3	57.6	
Level of Service	D	D		E	B	B	D	D	C	D	E	
Approach Delay (s)		39.9			31.7			39.3			48.3	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: I-5 SB & Wilsonville Rd

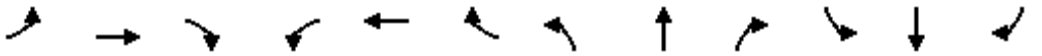
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	883	595	548	915	0	0	0	0	400	1	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Lane Util. Factor		0.91	1.00	0.97	0.95					0.95	0.95	0.88
Frpb, ped/bikes		1.00	0.97	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1504	3467	3471					1715	1719	2682
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1504	3467	3471					1715	1719	2682
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	901	607	559	934	0	0	0	0	408	1	408
RTOR Reduction (vph)	0	0	396	0	0	0	0	0	0	0	0	191
Lane Group Flow (vph)	0	901	211	559	934	0	0	0	0	204	205	217
Confl. Peds. (#/hr)	7		11	11		7	1					1
Confl. Bikes (#/hr)						3						1
Heavy Vehicles (%)	0%	2%	4%	1%	4%	0%	0%	0%	0%	0%	0%	6%
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		2		1	6					7	7	4
Permitted Phases			2									
Actuated Green, G (s)		37.5	37.5	27.5	69.5					31.5	31.5	31.5
Effective Green, g (s)		37.5	37.5	27.5	69.5					31.5	31.5	31.5
Actuated g/C Ratio		0.34	0.34	0.25	0.63					0.29	0.29	0.29
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		4.9	4.9	2.3	4.9					2.3	2.3	2.3
Lane Grp Cap (vph)		1733	512	866	2193					491	492	768
v/s Ratio Prot		c0.18		c0.16	0.27					0.12	c0.12	0.08
v/s Ratio Perm			0.14									
v/c Ratio		0.52	0.41	0.65	0.43					0.42	0.42	0.28
Uniform Delay, d1		29.0	27.8	36.9	10.2					31.8	31.8	30.5
Progression Factor		0.68	0.66	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.8	1.8	3.7	0.6					2.6	2.6	0.1
Delay (s)		20.5	20.1	40.6	10.8					34.4	34.4	30.6
Level of Service		C	C	D	B					C	C	C
Approach Delay (s)		20.3			22.0			0.0			32.5	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Analysis – Existing + Stage II

HCM Signalized Intersection Capacity Analysis
1: Boones Ferry Rd & 95th Ave

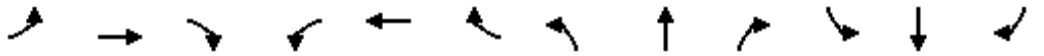


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	204	2	918	63	16	2	674	755	5	2	1083	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		1.00	0.88	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85	1.00	0.98		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1737	2734	1805	1686		3183	3468		1805	3574	1497
Flt Permitted		0.72	1.00	0.42	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1304	2734	798	1686		3183	3468		1805	3574	1497
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)	210	2	946	65	16	2	695	778	5	2	1116	180
RTOR Reduction (vph)	0	0	18	0	2	0	0	0	0	0	0	90
Lane Group Flow (vph)	0	212	928	65	16	0	695	783	0	2	1116	90
Confl. Peds. (#/hr)	2					2	3		1	1		3
Confl. Bikes (#/hr)			2						1			
Heavy Vehicles (%)	4%	0%	3%	0%	12%	0%	10%	4%	0%	0%	1%	5%
Turn Type	Perm	NA	pm+ov	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								2
Actuated Green, G (s)		21.7	49.8	21.7	21.7		28.1	70.1		1.2	43.2	43.2
Effective Green, g (s)		21.7	49.8	21.7	21.7		28.1	70.1		1.2	43.2	43.2
Actuated g/C Ratio		0.21	0.47	0.21	0.21		0.27	0.67		0.01	0.41	0.41
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		269	1400	164	348		851	2315		20	1470	615
v/s Ratio Prot			c0.18		0.01		c0.22	0.23		0.00	c0.31	
v/s Ratio Perm		c0.16	0.16	0.08								0.06
v/c Ratio		0.79	0.66	0.40	0.05		0.82	0.34		0.10	0.76	0.15
Uniform Delay, d1		39.5	21.2	36.0	33.4		36.0	7.5		51.4	26.4	19.4
Progression Factor		1.00	1.00	1.00	1.00		1.11	0.56		1.00	1.00	1.00
Incremental Delay, d2		14.1	1.2	1.6	0.1		6.3	0.3		2.2	2.3	0.1
Delay (s)		53.6	22.4	37.6	33.4		46.2	4.5		53.6	28.8	19.5
Level of Service		D	C	D	C		D	A		D	C	B
Approach Delay (s)		28.1			36.7			24.1			27.5	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

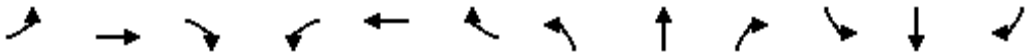
HCM Signalized Intersection Capacity Analysis
2: I-5 SB On Ramp/I-5 SB Off Ramp & Boones Ferry Road/Elligsen Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1160	904	0	727	406	0	0	0	549	0	707
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0				4.5	4.5	4.5
Lane Util. Factor		0.95	1.00		0.95	1.00				0.95	0.95	1.00
Frpb, ped/bikes		1.00	0.99		1.00	0.98				1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00				1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95	0.95	1.00
Satd. Flow (prot)		3539	1564		3471	1580				1649	1649	1495
Flt Permitted		1.00	1.00		1.00	1.00				0.95	0.95	1.00
Satd. Flow (perm)		3539	1564		3471	1580				1649	1649	1495
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1234	962	0	773	432	0	0	0	584	0	752
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	78
Lane Group Flow (vph)	0	1234	962	0	773	432	0	0	0	292	292	674
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)			1			5						
Heavy Vehicles (%)	0%	2%	2%	0%	4%	0%	0%	0%	0%	4%	0%	8%
Turn Type		NA	Free		NA	Free				Split	NA	Prot
Protected Phases		2			6					4	4	4
Permitted Phases			Free			Free						
Actuated Green, G (s)		44.9	105.0		44.9	105.0				50.6	50.6	50.6
Effective Green, g (s)		45.9	105.0		45.9	105.0				50.6	50.6	50.6
Actuated g/C Ratio		0.44	1.00		0.44	1.00				0.48	0.48	0.48
Clearance Time (s)		5.0			5.0					4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1547	1564		1517	1580				794	794	720
v/s Ratio Prot		c0.35			0.22					0.18	0.18	c0.45
v/s Ratio Perm			0.62			0.27						
v/c Ratio		0.80	0.62		0.51	0.27				0.37	0.37	0.94
Uniform Delay, d1		25.5	0.0		21.4	0.0				17.1	17.1	25.7
Progression Factor		0.90	1.00		1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2		3.0	1.2		1.2	0.4				0.3	0.3	19.4
Delay (s)		26.1	1.2		22.6	0.4				17.4	17.4	45.0
Level of Service		C	A		C	A				B	B	D
Approach Delay (s)		15.2			14.7			0.0			33.0	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

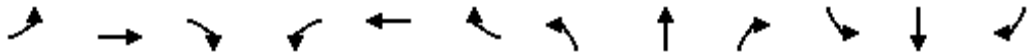
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	66	0	3	75	214	0	1	4	402	1	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97		0.99		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.88		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1700	1900		1805	1900	1457		1655		1719	1338	
Flt Permitted	0.87	1.00		0.71	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (perm)	1556	1900		1347	1900	1457		1655		1719	1338	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	57	74	0	3	84	240	0	1	4	452	1	82
RTOR Reduction (vph)	0	0	0	0	0	195	0	4	0	0	51	0
Lane Group Flow (vph)	57	74	0	3	84	45	0	1	0	452	32	0
Confl. Peds. (#/hr)	1					1			1	1		
Confl. Bikes (#/hr)			1			2						7
Heavy Vehicles (%)	6%	0%	0%	0%	0%	8%	0%	0%	0%	5%	0%	18%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases	2			6		6						
Actuated Green, G (s)	11.0	4.6		22.0	11.1	11.1		0.9		22.2	22.2	
Effective Green, g (s)	11.0	4.6		22.0	11.1	11.1		0.9		22.2	22.2	
Actuated g/C Ratio	0.19	0.08		0.38	0.19	0.19		0.02		0.38	0.38	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0		2.5		2.5	2.5	
Lane Grp Cap (vph)	307	149		606	359	275		25		651	506	
v/s Ratio Prot	c0.02	c0.04		0.00	c0.04			c0.00		c0.26	0.02	
v/s Ratio Perm	0.01			0.00		0.03						
v/c Ratio	0.19	0.50		0.00	0.23	0.17		0.04		0.69	0.06	
Uniform Delay, d1	20.1	25.9		11.5	20.1	19.9		28.4		15.3	11.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.2	2.6		0.0	0.3	0.3		0.5		3.0	0.0	
Delay (s)	20.3	28.5		11.5	20.5	20.2		28.9		18.3	11.6	
Level of Service	C	C		B	C	C		C		B	B	
Approach Delay (s)		24.9			20.2			28.9			17.3	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	58.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

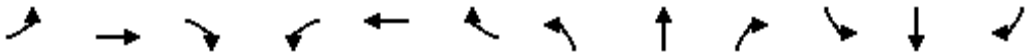


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	303	231	75	312	41	105	186	49	41	379	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1729		1752	1794		1770	1788		1766	1782	
Flt Permitted	0.30	1.00		0.13	1.00		0.12	1.00		0.53	1.00	
Satd. Flow (perm)	559	1729		244	1794		216	1788		994	1782	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	109	337	257	83	347	46	117	207	54	46	421	227
RTOR Reduction (vph)	0	29	0	0	5	0	0	9	0	0	20	0
Lane Group Flow (vph)	109	565	0	83	388	0	117	252	0	46	628	0
Confl. Peds. (#/hr)	1		2	2		1			3	3		
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	1%	2%	1%	3%	4%	2%	2%	2%	4%	2%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	37.6	31.0		36.2	30.3		40.6	34.5		36.8	32.6	
Effective Green, g (s)	37.6	31.0		36.2	30.3		40.6	34.5		36.8	32.6	
Actuated g/C Ratio	0.41	0.33		0.39	0.33		0.44	0.37		0.40	0.35	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.5		4.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	314	578		191	587		197	666		430	627	
v/s Ratio Prot	0.02	c0.33		c0.03	0.22		c0.04	0.14		0.00	c0.35	
v/s Ratio Perm	0.12			0.14			0.22			0.04		
v/c Ratio	0.35	0.98		0.43	0.66		0.59	0.38		0.11	1.00	
Uniform Delay, d1	18.5	30.5		21.7	26.7		21.0	21.2		17.3	30.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	31.6		1.6	2.8		4.7	0.4		0.1	36.3	
Delay (s)	19.2	62.0		23.2	29.5		25.7	21.6		17.4	66.3	
Level of Service	B	E		C	C		C	C		B	E	
Approach Delay (s)		55.4			28.4			22.9			63.1	
Approach LOS		E			C			C			E	

Intersection Summary			
HCM 2000 Control Delay	46.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	92.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Boones Ferry Rd & Wilsonville Rd

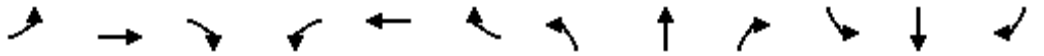


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	888	142	451	844	218	233	90	347	422	212	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0		5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.91		0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1687	3100		3467	3600	1347	1805	4600	1599	4000	1808	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1687	3100		3467	3600	1347	1805	4600	1599	4000	1808	
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)	52	915	146	465	870	225	240	93	358	435	219	64
RTOR Reduction (vph)	0	18	0	0	0	70	0	0	46	0	10	0
Lane Group Flow (vph)	52	1043	0	465	870	155	240	93	312	435	273	0
Confl. Peds. (#/hr)	5		5	5		5	2					2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	7%	3%	1%	1%	3%	16%	0%	1%	1%	3%	1%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		8	8	1	4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	7.0	33.6		17.7	44.3	44.3	18.5	18.5	36.2	20.2	20.2	
Effective Green, g (s)	7.0	34.6		17.7	45.3	45.3	18.5	18.5	36.2	20.2	20.2	
Actuated g/C Ratio	0.06	0.31		0.16	0.41	0.41	0.17	0.17	0.33	0.18	0.18	
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)	2.5	0.5		2.5	4.3	4.3	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	107	975		557	1482	554	303	773	598	734	332	
v/s Ratio Prot	0.03	c0.34		c0.13	0.24		c0.13	0.02	0.08	0.11	c0.15	
v/s Ratio Perm						0.12			0.11			
v/c Ratio	0.49	1.07		0.83	0.59	0.28	0.79	0.12	0.52	0.59	0.82	
Uniform Delay, d1	49.8	37.7		44.7	25.1	21.5	43.9	38.8	29.9	41.1	43.2	
Progression Factor	1.00	1.00		1.21	0.79	0.63	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.5	49.4		9.2	1.5	1.1	12.8	0.1	0.6	1.1	14.8	
Delay (s)	52.3	87.1		63.4	21.3	14.7	56.7	38.9	30.5	42.2	58.0	
Level of Service	D	F		E	C	B	E	D	C	D	E	
Approach Delay (s)		85.5			32.9			40.7			48.4	
Approach LOS		F			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	51.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: I-5 SB & Wilsonville Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	986	671	557	1039	0	0	0	0	408	1	477
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Lane Util. Factor		0.91	1.00	0.97	0.95					0.95	0.95	0.88
Frpb, ped/bikes		1.00	0.97	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1504	3467	3471					1715	1719	2682
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1504	3467	3471					1715	1719	2682
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1006	685	568	1060	0	0	0	0	416	1	487
RTOR Reduction (vph)	0	0	395	0	0	0	0	0	0	0	0	145
Lane Group Flow (vph)	0	1006	290	568	1060	0	0	0	0	208	209	342
Confl. Peds. (#/hr)	7		11	11		7	1					1
Confl. Bikes (#/hr)						3						1
Heavy Vehicles (%)	0%	2%	4%	1%	4%	0%	0%	0%	0%	0%	0%	6%
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		2		1	6					7	7	4
Permitted Phases			2									
Actuated Green, G (s)		37.5	37.5	27.5	69.5					31.5	31.5	31.5
Effective Green, g (s)		37.5	37.5	27.5	69.5					31.5	31.5	31.5
Actuated g/C Ratio		0.34	0.34	0.25	0.63					0.29	0.29	0.29
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		4.9	4.9	2.3	4.9					2.3	2.3	2.3
Lane Grp Cap (vph)		1733	512	866	2193					491	492	768
v/s Ratio Prot		c0.20		c0.16	0.31					0.12	0.12	c0.13
v/s Ratio Perm			0.19									
v/c Ratio		0.58	0.57	0.66	0.48					0.42	0.42	0.45
Uniform Delay, d1		29.8	29.6	37.0	10.7					31.9	31.9	32.1
Progression Factor		0.61	0.68	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.8	2.5	3.9	0.8					2.7	2.7	0.2
Delay (s)		18.8	22.6	40.9	11.5					34.5	34.6	32.3
Level of Service		B	C	D	B					C	C	C
Approach Delay (s)		20.3			21.7			0.0			33.4	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

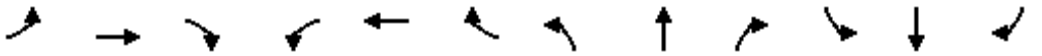
c Critical Lane Group

HCM Analysis – Existing + Project Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	203	2	872	63	16	2	609	754	5	2	1082	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		1.00	0.88	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85	1.00	0.98		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1737	2734	1805	1686		3183	3468		1805	3574	1497
Flt Permitted		0.72	1.00	0.42	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1304	2734	800	1686		3183	3468		1805	3574	1497
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)	209	2	899	65	16	2	628	777	5	2	1115	180
RTOR Reduction (vph)	0	0	18	0	2	0	0	0	0	0	0	90
Lane Group Flow (vph)	0	211	881	65	16	0	628	782	0	2	1115	90
Confl. Peds. (#/hr)	2					2	3		1	1		3
Confl. Bikes (#/hr)			2						1			
Heavy Vehicles (%)	4%	0%	3%	0%	12%	0%	10%	4%	0%	0%	1%	5%
Turn Type	Perm	NA	pm+ov	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								2
Actuated Green, G (s)		21.6	49.8	21.6	21.6		28.2	70.2		1.2	43.2	43.2
Effective Green, g (s)		21.6	49.8	21.6	21.6		28.2	70.2		1.2	43.2	43.2
Actuated g/C Ratio		0.21	0.47	0.21	0.21		0.27	0.67		0.01	0.41	0.41
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		268	1400	164	346		854	2318		20	1470	615
v/s Ratio Prot			c0.17		0.01		c0.20	0.23		0.00	c0.31	
v/s Ratio Perm		c0.16	0.15	0.08								0.06
v/c Ratio		0.79	0.63	0.40	0.05		0.74	0.34		0.10	0.76	0.15
Uniform Delay, d1		39.5	20.7	36.1	33.4		35.0	7.4		51.4	26.4	19.4
Progression Factor		1.00	1.00	1.00	1.00		1.11	0.60		1.00	1.00	1.00
Incremental Delay, d2		14.1	0.9	1.6	0.1		4.2	0.3		2.2	2.3	0.1
Delay (s)		53.6	21.6	37.6	33.5		43.1	4.8		53.6	28.7	19.5
Level of Service		D	C	D	C		D	A		D	C	B
Approach Delay (s)		27.7			36.7			21.8			27.5	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

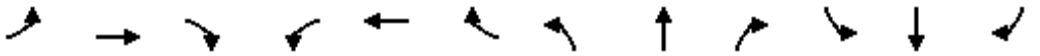
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1116	901	0	723	406	0	0	0	548	0	645
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0				4.5	4.5	4.5
Lane Util. Factor		0.95	1.00		0.95	1.00				0.95	0.95	1.00
Frpb, ped/bikes		1.00	0.99		1.00	0.98				1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00				1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95	0.95	1.00
Satd. Flow (prot)		3539	1564		3471	1580				1649	1649	1495
Flt Permitted		1.00	1.00		1.00	1.00				0.95	0.95	1.00
Satd. Flow (perm)		3539	1564		3471	1580				1649	1649	1495
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1187	959	0	769	432	0	0	0	583	0	686
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	85
Lane Group Flow (vph)	0	1187	959	0	769	432	0	0	0	291	292	601
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)			1			5						
Heavy Vehicles (%)	0%	2%	2%	0%	4%	0%	0%	0%	0%	4%	0%	8%
Turn Type		NA	Free		NA	Free				Split	NA	Prot
Protected Phases		2			6					4	4	4
Permitted Phases			Free			Free						
Actuated Green, G (s)		49.0	105.0		49.0	105.0				46.5	46.5	46.5
Effective Green, g (s)		50.0	105.0		50.0	105.0				46.5	46.5	46.5
Actuated g/C Ratio		0.48	1.00		0.48	1.00				0.44	0.44	0.44
Clearance Time (s)		5.0			5.0					4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1685	1564		1652	1580				730	730	662
v/s Ratio Prot		c0.34			0.22					0.18	0.18	c0.40
v/s Ratio Perm			0.61			0.27						
v/c Ratio		0.70	0.61		0.47	0.27				0.40	0.40	0.91
Uniform Delay, d1		21.7	0.0		18.5	0.0				19.8	19.8	27.2
Progression Factor		0.86	1.00		1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2		1.8	1.3		0.9	0.4				0.4	0.4	16.1
Delay (s)		20.4	1.3		19.5	0.4				20.1	20.2	43.4
Level of Service		C	A		B	A				C	C	D
Approach Delay (s)		11.8			12.6			0.0			32.7	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

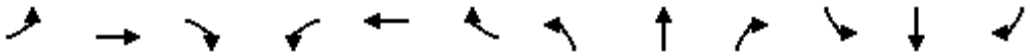
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	47	0	3	25	200	0	1	4	388	1	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		0.99		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.88		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1700	1900		1805	1900	1458		1655		1719	1350	
Flt Permitted	0.95	1.00		0.72	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (perm)	1704	1900		1373	1900	1458		1655		1719	1350	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	40	53	0	3	28	225	0	1	4	436	1	26
RTOR Reduction (vph)	0	0	0	0	0	172	0	4	0	0	16	0
Lane Group Flow (vph)	40	53	0	3	28	53	0	1	0	436	11	0
Confl. Peds. (#/hr)	1					1			1	1		
Confl. Bikes (#/hr)			1			2						7
Heavy Vehicles (%)	6%	0%	0%	0%	0%	8%	0%	0%	0%	5%	0%	18%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases	2			6		6						
Actuated Green, G (s)	8.2	4.2		22.4	13.9	13.9		0.9		22.1	22.1	
Effective Green, g (s)	8.2	4.2		22.4	13.9	13.9		0.9		22.1	22.1	
Actuated g/C Ratio	0.14	0.07		0.38	0.24	0.24		0.02		0.38	0.38	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0		2.5		2.5	2.5	
Lane Grp Cap (vph)	236	135		622	448	344		25		644	506	
v/s Ratio Prot	c0.01	c0.03		0.00	0.01			c0.00		c0.25	0.01	
v/s Ratio Perm	0.01			0.00		c0.04						
v/c Ratio	0.17	0.39		0.00	0.06	0.15		0.04		0.68	0.02	
Uniform Delay, d1	22.3	26.1		11.3	17.4	17.8		28.6		15.4	11.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.2	1.9		0.0	0.1	0.2		0.5		2.6	0.0	
Delay (s)	22.6	28.0		11.3	17.5	18.1		29.1		18.0	11.6	
Level of Service	C	C		B	B	B		C		B	B	
Approach Delay (s)		25.7			17.9			29.1			17.6	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	58.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	49.0%	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												
Volume (vph)	83	274	229	73	263	41	103	184	46	41	376	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.98		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1723		1752	1789		1770	1791		1766	1790	
Flt Permitted	0.36	1.00		0.14	1.00		0.11	1.00		0.55	1.00	
Satd. Flow (perm)	680	1723		254	1789		214	1791		1015	1790	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	92	304	254	81	292	46	114	204	51	46	418	199
RTOR Reduction (vph)	0	32	0	0	6	0	0	9	0	0	17	0
Lane Group Flow (vph)	92	526	0	81	332	0	114	246	0	46	600	0
Confl. Peds. (#/hr)	1		2	2		1			3	3		
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	1%	2%	1%	3%	4%	2%	2%	2%	4%	2%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	35.9	29.6		34.9	29.1		40.8	34.8		37.2	33.0	
Effective Green, g (s)	35.9	29.6		34.9	29.1		40.8	34.8		37.2	33.0	
Actuated g/C Ratio	0.39	0.32		0.38	0.32		0.45	0.38		0.41	0.36	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.5		4.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	343	557		192	569		197	681		447	646	
v/s Ratio Prot	0.02	c0.31		c0.03	0.19		c0.04	0.14		0.00	c0.34	
v/s Ratio Perm	0.09			0.13			0.22			0.04		
v/c Ratio	0.27	0.94		0.42	0.58		0.58	0.36		0.10	0.93	
Uniform Delay, d1	18.4	30.1		21.4	26.1		19.7	20.3		16.6	28.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	24.9		1.5	1.5		4.1	0.3		0.1	19.6	
Delay (s)	18.8	55.0		22.9	27.6		23.8	20.7		16.7	47.7	
Level of Service	B	E		C	C		C	C		B	D	
Approach Delay (s)		49.9			26.7			21.6			45.5	
Approach LOS		D			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	91.4	Sum of lost time (s)	17.0
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	741	103	449	664	207	166	88	344	406	208	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0		5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.91		0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1687	3100		3467	3600	1348	1805	4600	1599	4000	1809	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1687	3100		3467	3600	1348	1805	4600	1599	4000	1809	
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)	46	764	106	463	685	213	171	91	355	419	214	61
RTOR Reduction (vph)	0	15	0	0	0	80	0	0	48	0	10	0
Lane Group Flow (vph)	46	855	0	463	685	133	171	91	307	419	265	0
Confl. Peds. (#/hr)	5		5	5		5	2					2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	7%	3%	1%	1%	3%	16%	0%	1%	1%	3%	1%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		8	8	1	4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	7.0	36.4		18.6	48.0	48.0	15.2	15.2	33.8	19.8	19.8	
Effective Green, g (s)	7.0	37.4		18.6	49.0	49.0	15.2	15.2	33.8	19.8	19.8	
Actuated g/C Ratio	0.06	0.34		0.17	0.45	0.45	0.14	0.14	0.31	0.18	0.18	
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)	2.5	0.5		2.5	4.3	4.3	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	107	1054		586	1603	600	249	635	564	720	325	
v/s Ratio Prot	0.03	c0.28		c0.13	0.19		c0.09	0.02	0.09	0.10	c0.15	
v/s Ratio Perm						0.10			0.10			
v/c Ratio	0.43	0.81		0.79	0.43	0.22	0.69	0.14	0.54	0.58	0.82	
Uniform Delay, d1	49.6	33.1		43.8	20.9	18.8	45.1	41.7	31.7	41.3	43.3	
Progression Factor	1.00	1.00		1.25	0.80	0.61	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.0	6.8		6.4	0.8	0.8	7.0	0.1	0.9	1.0	14.2	
Delay (s)	51.6	39.9		61.2	17.6	12.2	52.1	41.8	32.5	42.3	57.6	
Level of Service	D	D		E	B	B	D	D	C	D	E	
Approach Delay (s)		40.5			31.6			39.3			48.3	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		

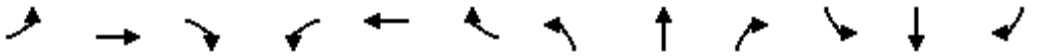
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	883	608	548	923	0	0	0	0	400	1	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Lane Util. Factor		0.91	1.00	0.97	0.95					0.95	0.95	0.88
Frpb, ped/bikes		1.00	0.97	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1504	3467	3471					1715	1719	2682
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1504	3467	3471					1715	1719	2682
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	901	620	559	942	0	0	0	0	408	1	408
RTOR Reduction (vph)	0	0	396	0	0	0	0	0	0	0	0	187
Lane Group Flow (vph)	0	901	224	559	942	0	0	0	0	204	205	221
Confl. Peds. (#/hr)	7		11	11		7	1					1
Confl. Bikes (#/hr)						3						1
Heavy Vehicles (%)	0%	2%	4%	1%	4%	0%	0%	0%	0%	0%	0%	6%
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		2		1	6					7	7	4
Permitted Phases			2									
Actuated Green, G (s)		37.5	37.5	27.5	69.5					31.5	31.5	31.5
Effective Green, g (s)		37.5	37.5	27.5	69.5					31.5	31.5	31.5
Actuated g/C Ratio		0.34	0.34	0.25	0.63					0.29	0.29	0.29
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		4.9	4.9	2.3	4.9					2.3	2.3	2.3
Lane Grp Cap (vph)		1733	512	866	2193					491	492	768
v/s Ratio Prot		c0.18		c0.16	0.27					0.12	c0.12	0.08
v/s Ratio Perm			0.15									
v/c Ratio		0.52	0.44	0.65	0.43					0.42	0.42	0.29
Uniform Delay, d1		29.0	28.1	36.9	10.2					31.8	31.8	30.5
Progression Factor		0.67	0.64	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.8	2.0	3.7	0.6					2.6	2.6	0.1
Delay (s)		20.3	19.8	40.6	10.8					34.4	34.4	30.6
Level of Service		C	B	D	B					C	C	C
Approach Delay (s)		20.1			21.9			0.0			32.5	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

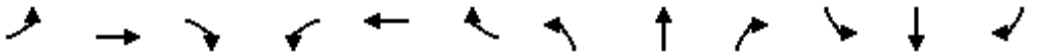
HCM Analysis – Existing + Project Phase 1 + Stage II



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	207	2	935	63	16	2	684	755	5	2	1083	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		1.00	0.88	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85	1.00	0.98		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1737	2734	1805	1686		3183	3468		1805	3574	1497
Flt Permitted		0.72	1.00	0.42	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1304	2734	789	1686		3183	3468		1805	3574	1497
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)	213	2	964	65	16	2	705	778	5	2	1116	182
RTOR Reduction (vph)	0	0	18	0	2	0	0	0	0	0	0	91
Lane Group Flow (vph)	0	215	946	65	16	0	705	783	0	2	1116	91
Confl. Peds. (#/hr)	2					2	3		1	1		3
Confl. Bikes (#/hr)			2						1			
Heavy Vehicles (%)	4%	0%	3%	0%	12%	0%	10%	4%	0%	0%	1%	5%
Turn Type	Perm	NA	pm+ov	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								2
Actuated Green, G (s)		21.8	49.9	21.8	21.8		28.1	70.0		1.2	43.1	43.1
Effective Green, g (s)		21.8	49.9	21.8	21.8		28.1	70.0		1.2	43.1	43.1
Actuated g/C Ratio		0.21	0.48	0.21	0.21		0.27	0.67		0.01	0.41	0.41
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		270	1403	163	350		851	2312		20	1467	614
v/s Ratio Prot			c0.18		0.01		c0.22	0.23		0.00	c0.31	
v/s Ratio Perm		c0.16	0.17	0.08								0.06
v/c Ratio		0.80	0.67	0.40	0.05		0.83	0.34		0.10	0.76	0.15
Uniform Delay, d1		39.5	21.3	35.9	33.3		36.2	7.5		51.4	26.5	19.4
Progression Factor		1.00	1.00	1.00	1.00		1.10	0.56		1.00	1.00	1.00
Incremental Delay, d2		14.9	1.3	1.6	0.1		6.6	0.3		2.2	2.4	0.1
Delay (s)		54.4	22.6	37.5	33.3		46.6	4.5		53.6	28.9	19.5
Level of Service		D	C	D	C		D	A		D	C	B
Approach Delay (s)		28.4			36.6			24.4			27.6	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		

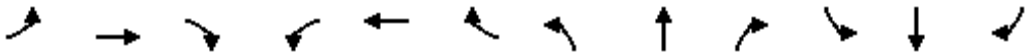
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1177	904	0	727	406	0	0	0	549	0	717
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0				4.5	4.5	4.5
Lane Util. Factor		0.95	1.00		0.95	1.00				0.95	0.95	1.00
Frpb, ped/bikes		1.00	0.99		1.00	0.98				1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00				1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95	0.95	1.00
Satd. Flow (prot)		3539	1564		3471	1580				1649	1649	1495
Flt Permitted		1.00	1.00		1.00	1.00				0.95	0.95	1.00
Satd. Flow (perm)		3539	1564		3471	1580				1649	1649	1495
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1252	962	0	773	432	0	0	0	584	0	763
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	79
Lane Group Flow (vph)	0	1252	962	0	773	432	0	0	0	292	292	684
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)			1			5						
Heavy Vehicles (%)	0%	2%	2%	0%	4%	0%	0%	0%	0%	4%	0%	8%
Turn Type		NA	Free		NA	Free				Split	NA	Prot
Protected Phases		2			6					4	4	4
Permitted Phases			Free			Free						
Actuated Green, G (s)		45.4	105.0		45.4	105.0				50.1	50.1	50.1
Effective Green, g (s)		46.4	105.0		46.4	105.0				50.1	50.1	50.1
Actuated g/C Ratio		0.44	1.00		0.44	1.00				0.48	0.48	0.48
Clearance Time (s)		5.0			5.0					4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1563	1564		1533	1580				786	786	713
v/s Ratio Prot		c0.35			0.22					0.18	0.18	c0.46
v/s Ratio Perm			0.62			0.27						
v/c Ratio		0.80	0.62		0.50	0.27				0.37	0.37	0.96
Uniform Delay, d1		25.3	0.0		21.0	0.0				17.4	17.4	26.5
Progression Factor		0.92	1.00		1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2		3.0	1.2		1.2	0.4				0.3	0.3	23.8
Delay (s)		26.2	1.2		22.2	0.4				17.7	17.7	50.3
Level of Service		C	A		C	A				B	B	D
Approach Delay (s)		15.4			14.4			0.0			36.2	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

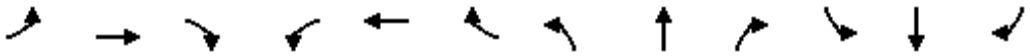
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	84	0	3	85	214	0	1	4	402	1	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97		0.99		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.88		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1701	1900		1805	1900	1458		1655		1719	1336	
Flt Permitted	0.69	1.00		0.70	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (perm)	1244	1900		1323	1900	1458		1655		1719	1336	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	80	94	0	3	96	240	0	1	4	452	1	96
RTOR Reduction (vph)	0	0	0	0	0	187	0	4	0	0	62	0
Lane Group Flow (vph)	80	94	0	3	96	53	0	1	0	452	35	0
Confl. Peds. (#/hr)	1					1			1	1		
Confl. Bikes (#/hr)			1			2						7
Heavy Vehicles (%)	6%	0%	0%	0%	0%	8%	0%	0%	0%	5%	0%	18%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases	2			6		6						
Actuated Green, G (s)	13.6	6.7		24.9	13.5	13.5		0.9		22.0	22.0	
Effective Green, g (s)	13.6	6.7		24.9	13.5	13.5		0.9		22.0	22.0	
Actuated g/C Ratio	0.22	0.11		0.41	0.22	0.22		0.01		0.36	0.36	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0		2.5		2.5	2.5	
Lane Grp Cap (vph)	327	207		645	418	321		24		616	479	
v/s Ratio Prot	c0.03	c0.05		0.00	c0.05			c0.00		c0.26	0.03	
v/s Ratio Perm	0.03			0.00		0.04						
v/c Ratio	0.24	0.45		0.00	0.23	0.16		0.04		0.73	0.07	
Uniform Delay, d1	19.8	25.6		10.8	19.6	19.3		29.8		17.1	12.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.6		0.0	0.3	0.2		0.6		4.3	0.0	
Delay (s)	20.1	27.2		10.8	19.9	19.6		30.3		21.4	13.0	
Level of Service	C	C		B	B	B		C		C	B	
Approach Delay (s)		23.9			19.6			30.3			19.9	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	61.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	49.8%	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												
Volume (vph)	98	321	231	75	322	41	105	186	49	41	379	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1734		1752	1795		1770	1788		1766	1782	
Flt Permitted	0.28	1.00		0.13	1.00		0.12	1.00		0.53	1.00	
Satd. Flow (perm)	534	1734		244	1795		216	1788		994	1782	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	109	357	257	83	358	46	117	207	54	46	421	227
RTOR Reduction (vph)	0	27	0	0	5	0	0	9	0	0	20	0
Lane Group Flow (vph)	109	587	0	83	399	0	117	252	0	46	628	0
Confl. Peds. (#/hr)	1		2	2		1			3	3		
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	1%	2%	1%	3%	4%	2%	2%	2%	4%	2%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	37.6	31.0		36.2	30.3		40.6	34.5		36.8	32.6	
Effective Green, g (s)	37.6	31.0		36.2	30.3		40.6	34.5		36.8	32.6	
Actuated g/C Ratio	0.41	0.33		0.39	0.33		0.44	0.37		0.40	0.35	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.5		4.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	306	580		191	587		197	666		430	627	
v/s Ratio Prot	0.03	c0.34		c0.03	0.22		c0.04	0.14		0.00	c0.35	
v/s Ratio Perm	0.12			0.14			0.22			0.04		
v/c Ratio	0.36	1.01		0.43	0.68		0.59	0.38		0.11	1.00	
Uniform Delay, d1	18.6	30.8		21.9	27.0		21.0	21.2		17.3	30.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	40.6		1.6	3.2		4.7	0.4		0.1	36.3	
Delay (s)	19.3	71.4		23.5	30.2		25.7	21.6		17.4	66.3	
Level of Service	B	E		C	C		C	C		B	E	
Approach Delay (s)		63.5			29.1			22.9			63.1	
Approach LOS		E			C			C			E	

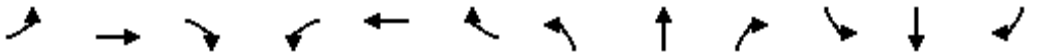
Intersection Summary			
HCM 2000 Control Delay	49.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	92.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	901	142	451	852	218	233	90	347	422	212	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0		5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.91		0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1687	3100		3467	3600	1347	1805	4600	1599	4000	1808	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1687	3100		3467	3600	1347	1805	4600	1599	4000	1808	
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)	52	929	146	465	878	225	240	93	358	435	219	64
RTOR Reduction (vph)	0	18	0	0	0	70	0	0	46	0	10	0
Lane Group Flow (vph)	52	1057	0	465	878	155	240	93	312	435	273	0
Confl. Peds. (#/hr)	5		5	5		5	2					2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	7%	3%	1%	1%	3%	16%	0%	1%	1%	3%	1%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		8	8	1	4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	7.0	33.6		17.7	44.3	44.3	18.5	18.5	36.2	20.2	20.2	
Effective Green, g (s)	7.0	34.6		17.7	45.3	45.3	18.5	18.5	36.2	20.2	20.2	
Actuated g/C Ratio	0.06	0.31		0.16	0.41	0.41	0.17	0.17	0.33	0.18	0.18	
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)	2.5	0.5		2.5	4.3	4.3	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	107	975		557	1482	554	303	773	598	734	332	
v/s Ratio Prot	0.03	c0.34		c0.13	0.24		c0.13	0.02	0.08	0.11	c0.15	
v/s Ratio Perm						0.12			0.11			
v/c Ratio	0.49	1.08		0.83	0.59	0.28	0.79	0.12	0.52	0.59	0.82	
Uniform Delay, d1	49.8	37.7		44.7	25.2	21.5	43.9	38.8	29.9	41.1	43.2	
Progression Factor	1.00	1.00		1.21	0.79	0.63	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.5	54.5		9.1	1.5	1.1	12.8	0.1	0.6	1.1	14.8	
Delay (s)	52.3	92.2		63.3	21.3	14.6	56.7	38.9	30.5	42.2	58.0	
Level of Service	D	F		E	C	B	E	D	C	D	E	
Approach Delay (s)		90.3			32.8			40.7			48.4	
Approach LOS		F			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	52.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	986	684	557	1047	0	0	0	0	408	1	477
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Lane Util. Factor		0.91	1.00	0.97	0.95					0.95	0.95	0.88
Frpb, ped/bikes		1.00	0.97	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1504	3467	3471					1715	1719	2682
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1504	3467	3471					1715	1719	2682
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1006	698	568	1068	0	0	0	0	416	1	487
RTOR Reduction (vph)	0	0	395	0	0	0	0	0	0	0	0	142
Lane Group Flow (vph)	0	1006	303	568	1068	0	0	0	0	208	209	345
Confl. Peds. (#/hr)	7		11	11		7	1					1
Confl. Bikes (#/hr)						3						1
Heavy Vehicles (%)	0%	2%	4%	1%	4%	0%	0%	0%	0%	0%	0%	6%
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		2		1	6					7	7	4
Permitted Phases			2									
Actuated Green, G (s)		37.5	37.5	27.5	69.5					31.5	31.5	31.5
Effective Green, g (s)		37.5	37.5	27.5	69.5					31.5	31.5	31.5
Actuated g/C Ratio		0.34	0.34	0.25	0.63					0.29	0.29	0.29
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		4.9	4.9	2.3	4.9					2.3	2.3	2.3
Lane Grp Cap (vph)		1733	512	866	2193					491	492	768
v/s Ratio Prot		0.20		c0.16	0.31					0.12	0.12	c0.13
v/s Ratio Perm			c0.20									
v/c Ratio		0.58	0.59	0.66	0.49					0.42	0.42	0.45
Uniform Delay, d1		29.8	29.9	37.0	10.8					31.9	31.9	32.1
Progression Factor		0.60	0.71	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.8	2.6	3.9	0.8					2.7	2.7	0.2
Delay (s)		18.6	23.8	40.9	11.5					34.5	34.6	32.4
Level of Service		B	C	D	B					C	C	C
Approach Delay (s)		20.8			21.7			0.0			33.4	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	82.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

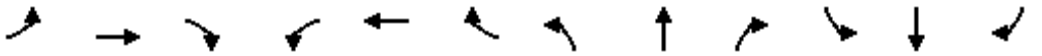
HCM Analysis – Existing + Project Phase 2

DKS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	205	2	880	63	16	2	615	754	5	2	1082	176
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		1.00	0.88	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85	1.00	0.98		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1737	2734	1805	1686		3183	3468		1805	3574	1497
Flt Permitted		0.72	1.00	0.42	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1304	2734	794	1686		3183	3468		1805	3574	1497
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)	211	2	907	65	16	2	634	777	5	2	1115	181
RTOR Reduction (vph)	0	0	18	0	2	0	0	0	0	0	0	91
Lane Group Flow (vph)	0	213	889	65	16	0	634	782	0	2	1115	90
Confl. Peds. (#/hr)	2					2	3		1	1		3
Confl. Bikes (#/hr)			2						1			
Heavy Vehicles (%)	4%	0%	3%	0%	12%	0%	10%	4%	0%	0%	1%	5%
Turn Type	Perm	NA	pm+ov	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								2
Actuated Green, G (s)		21.7	49.9	21.7	21.7		28.2	70.1		1.2	43.1	43.1
Effective Green, g (s)		21.7	49.9	21.7	21.7		28.2	70.1		1.2	43.1	43.1
Actuated g/C Ratio		0.21	0.48	0.21	0.21		0.27	0.67		0.01	0.41	0.41
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		269	1403	164	348		854	2315		20	1467	614
v/s Ratio Prot			c0.17		0.01		c0.20	0.23		0.00	c0.31	
v/s Ratio Perm		c0.16	0.15	0.08								0.06
v/c Ratio		0.79	0.63	0.40	0.05		0.74	0.34		0.10	0.76	0.15
Uniform Delay, d1		39.5	20.7	36.0	33.4		35.1	7.5		51.4	26.5	19.4
Progression Factor		1.00	1.00	1.00	1.00		1.14	0.60		1.00	1.00	1.00
Incremental Delay, d2		14.7	0.9	1.6	0.1		4.4	0.3		2.2	2.4	0.1
Delay (s)		54.2	21.6	37.6	33.4		44.2	4.8		53.6	28.9	19.5
Level of Service		D	C	D	C		D	A		D	C	B
Approach Delay (s)		27.8			36.7			22.4			27.6	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		

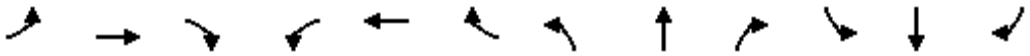
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1124	901	0	723	406	0	0	0	548	0	651
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0				4.5	4.5	4.5
Lane Util. Factor		0.95	1.00		0.95	1.00				0.95	0.95	1.00
Frpb, ped/bikes		1.00	0.99		1.00	0.98				1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00				1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95	0.95	1.00
Satd. Flow (prot)		3539	1564		3471	1580				1649	1649	1495
Flt Permitted		1.00	1.00		1.00	1.00				0.95	0.95	1.00
Satd. Flow (perm)		3539	1564		3471	1580				1649	1649	1495
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1196	959	0	769	432	0	0	0	583	0	693
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	84
Lane Group Flow (vph)	0	1196	959	0	769	432	0	0	0	291	292	609
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)			1			5						
Heavy Vehicles (%)	0%	2%	2%	0%	4%	0%	0%	0%	0%	4%	0%	8%
Turn Type		NA	Free		NA	Free				Split	NA	Prot
Protected Phases		2			6					4	4	4
Permitted Phases			Free			Free						
Actuated Green, G (s)		48.3	105.0		48.3	105.0				47.2	47.2	47.2
Effective Green, g (s)		49.3	105.0		49.3	105.0				47.2	47.2	47.2
Actuated g/C Ratio		0.47	1.00		0.47	1.00				0.45	0.45	0.45
Clearance Time (s)		5.0			5.0					4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1661	1564		1629	1580				741	741	672
v/s Ratio Prot		c0.34			0.22					0.18	0.18	c0.41
v/s Ratio Perm			0.61			0.27						
v/c Ratio		0.72	0.61		0.47	0.27				0.39	0.39	0.91
Uniform Delay, d1		22.3	0.0		19.0	0.0				19.3	19.3	26.8
Progression Factor		0.87	1.00		1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2		1.9	1.3		1.0	0.4				0.3	0.3	15.8
Delay (s)		21.2	1.3		20.0	0.4				19.7	19.7	42.6
Level of Service		C	A		B	A				B	B	D
Approach Delay (s)		12.3			12.9			0.0			32.1	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

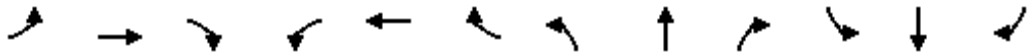
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	54	0	3	31	200	0	1	4	388	1	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		0.99		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.88		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1700	1900		1805	1900	1458		1655		1719	1345	
Flt Permitted	0.91	1.00		0.72	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (perm)	1627	1900		1363	1900	1458		1655		1719	1345	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	52	61	0	3	35	225	0	1	4	436	1	34
RTOR Reduction (vph)	0	0	0	0	0	172	0	4	0	0	21	0
Lane Group Flow (vph)	52	61	0	3	35	53	0	1	0	436	14	0
Confl. Peds. (#/hr)	1					1			1	1		
Confl. Bikes (#/hr)			1			2						7
Heavy Vehicles (%)	6%	0%	0%	0%	0%	8%	0%	0%	0%	5%	0%	18%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases	2			6		6						
Actuated Green, G (s)	8.5	4.4		22.6	14.0	14.0		0.9		22.1	22.1	
Effective Green, g (s)	8.5	4.4		22.6	14.0	14.0		0.9		22.1	22.1	
Actuated g/C Ratio	0.14	0.07		0.38	0.24	0.24		0.02		0.37	0.37	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0		2.5		2.5	2.5	
Lane Grp Cap (vph)	239	141		623	450	345		25		642	502	
v/s Ratio Prot	c0.02	c0.03		0.00	0.02			c0.00		c0.25	0.01	
v/s Ratio Perm	0.02			0.00		c0.04						
v/c Ratio	0.22	0.43		0.00	0.08	0.15		0.04		0.68	0.03	
Uniform Delay, d1	22.4	26.2		11.3	17.5	17.9		28.7		15.5	11.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.3	2.1		0.0	0.1	0.2		0.5		2.6	0.0	
Delay (s)	22.7	28.3		11.3	17.6	18.1		29.2		18.1	11.7	
Level of Service	C	C		B	B	B		C		B	B	
Approach Delay (s)		25.7			17.9			29.2			17.6	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	59.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	49.0%	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												
Volume (vph)	83	281	229	73	269	41	103	184	46	41	376	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.98		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1725		1752	1790		1770	1790		1766	1790	
Flt Permitted	0.36	1.00		0.14	1.00		0.12	1.00		0.54	1.00	
Satd. Flow (perm)	670	1725		249	1790		215	1790		1012	1790	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	92	312	254	81	299	46	114	204	51	46	418	199
RTOR Reduction (vph)	0	30	0	0	5	0	0	9	0	0	17	0
Lane Group Flow (vph)	92	536	0	81	340	0	114	246	0	46	600	0
Confl. Peds. (#/hr)	1		2	2		1			3	3		
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	1%	2%	1%	3%	4%	2%	2%	2%	4%	2%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	36.4	30.1		35.4	29.6		40.7	34.7		37.1	32.9	
Effective Green, g (s)	36.4	30.1		35.4	29.6		40.7	34.7		37.1	32.9	
Actuated g/C Ratio	0.40	0.33		0.39	0.32		0.44	0.38		0.40	0.36	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.5		4.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	342	565		190	577		196	676		443	641	
v/s Ratio Prot	0.02	c0.31		c0.03	0.19		c0.04	0.14		0.00	c0.33	
v/s Ratio Perm	0.09			0.14			0.22			0.04		
v/c Ratio	0.27	0.95		0.43	0.59		0.58	0.36		0.10	0.94	
Uniform Delay, d1	18.3	30.1		21.3	26.0		20.0	20.6		16.8	28.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	25.3		1.5	1.5		4.3	0.3		0.1	21.0	
Delay (s)	18.7	55.4		22.9	27.5		24.3	20.9		16.9	49.4	
Level of Service	B	E		C	C		C	C		B	D	
Approach Delay (s)		50.3			26.7			22.0			47.2	
Approach LOS		D			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	39.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	91.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	748	103	449	669	207	166	88	344	406	208	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0		5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.91		0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1687	3100		3467	3600	1348	1805	4600	1599	4000	1809	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1687	3100		3467	3600	1348	1805	4600	1599	4000	1809	
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)	46	771	106	463	690	213	171	91	355	419	214	61
RTOR Reduction (vph)	0	15	0	0	0	79	0	0	48	0	10	0
Lane Group Flow (vph)	46	862	0	463	690	134	171	91	307	419	265	0
Confl. Peds. (#/hr)	5		5	5		5	2					2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	7%	3%	1%	1%	3%	16%	0%	1%	1%	3%	1%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		8	8	1	4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	7.0	36.4		18.6	48.0	48.0	15.2	15.2	33.8	19.8	19.8	
Effective Green, g (s)	7.0	37.4		18.6	49.0	49.0	15.2	15.2	33.8	19.8	19.8	
Actuated g/C Ratio	0.06	0.34		0.17	0.45	0.45	0.14	0.14	0.31	0.18	0.18	
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)	2.5	0.5		2.5	4.3	4.3	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	107	1054		586	1603	600	249	635	564	720	325	
v/s Ratio Prot	0.03	c0.28		c0.13	0.19		c0.09	0.02	0.09	0.10	c0.15	
v/s Ratio Perm						0.10			0.10			
v/c Ratio	0.43	0.82		0.79	0.43	0.22	0.69	0.14	0.54	0.58	0.82	
Uniform Delay, d1	49.6	33.2		43.8	20.9	18.8	45.1	41.7	31.7	41.3	43.3	
Progression Factor	1.00	1.00		1.25	0.80	0.61	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.0	7.1		6.4	0.8	0.8	7.0	0.1	0.9	1.0	14.2	
Delay (s)	51.6	40.3		61.2	17.6	12.2	52.1	41.8	32.5	42.3	57.6	
Level of Service	D	D		E	B	B	D	D	C	D	E	
Approach Delay (s)		40.8			31.5			39.3			48.3	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	38.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		

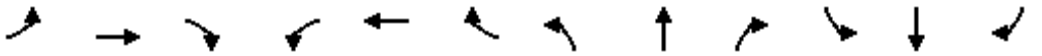
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	883	615	548	928	0	0	0	0	400	1	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Lane Util. Factor		0.91	1.00	0.97	0.95					0.95	0.95	0.88
Frpb, ped/bikes		1.00	0.97	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1504	3467	3471					1715	1719	2682
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1504	3467	3471					1715	1719	2682
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	901	628	559	947	0	0	0	0	408	1	408
RTOR Reduction (vph)	0	0	396	0	0	0	0	0	0	0	0	185
Lane Group Flow (vph)	0	901	232	559	947	0	0	0	0	204	205	223
Confl. Peds. (#/hr)	7		11	11		7	1					1
Confl. Bikes (#/hr)						3						1
Heavy Vehicles (%)	0%	2%	4%	1%	4%	0%	0%	0%	0%	0%	0%	6%
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		2		1	6					7	7	4
Permitted Phases			2									
Actuated Green, G (s)		37.5	37.5	27.5	69.5					31.5	31.5	31.5
Effective Green, g (s)		37.5	37.5	27.5	69.5					31.5	31.5	31.5
Actuated g/C Ratio		0.34	0.34	0.25	0.63					0.29	0.29	0.29
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		4.9	4.9	2.3	4.9					2.3	2.3	2.3
Lane Grp Cap (vph)		1733	512	866	2193					491	492	768
v/s Ratio Prot		c0.18		c0.16	0.27					0.12	c0.12	0.08
v/s Ratio Perm			0.15									
v/c Ratio		0.52	0.45	0.65	0.43					0.42	0.42	0.29
Uniform Delay, d1		29.0	28.3	36.9	10.3					31.8	31.8	30.6
Progression Factor		0.67	0.63	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.8	2.1	3.7	0.6					2.6	2.6	0.1
Delay (s)		20.2	19.9	40.6	10.9					34.4	34.4	30.7
Level of Service		C	B	D	B					C	C	C
Approach Delay (s)		20.1			21.9			0.0			32.5	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

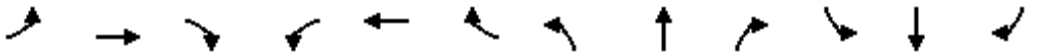
HCM Analysis – Existing + Project Phase 2 + Stage II



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	209	2	943	63	16	2	690	755	5	2	1083	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		1.00	0.88	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85	1.00	0.98		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1737	2733	1805	1686		3183	3468		1805	3574	1497
Flt Permitted		0.72	1.00	0.41	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1304	2733	786	1686		3183	3468		1805	3574	1497
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)	215	2	972	65	16	2	711	778	5	2	1116	184
RTOR Reduction (vph)	0	0	18	0	2	0	0	0	0	0	0	92
Lane Group Flow (vph)	0	217	954	65	16	0	711	783	0	2	1116	92
Confl. Peds. (#/hr)	2					2	3		1	1		3
Confl. Bikes (#/hr)			2						1			
Heavy Vehicles (%)	4%	0%	3%	0%	12%	0%	10%	4%	0%	0%	1%	5%
Turn Type	Perm	NA	pm+ov	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								2
Actuated Green, G (s)		22.0	49.8	22.0	22.0		27.8	69.8		1.2	43.2	43.2
Effective Green, g (s)		22.0	49.8	22.0	22.0		27.8	69.8		1.2	43.2	43.2
Actuated g/C Ratio		0.21	0.47	0.21	0.21		0.26	0.66		0.01	0.41	0.41
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		273	1400	164	353		842	2305		20	1470	615
v/s Ratio Prot			c0.18		0.01		c0.22	0.23		0.00	c0.31	
v/s Ratio Perm		c0.17	0.17	0.08								0.06
v/c Ratio		0.79	0.68	0.40	0.05		0.84	0.34		0.10	0.76	0.15
Uniform Delay, d1		39.4	21.4	35.8	33.1		36.6	7.6		51.4	26.4	19.4
Progression Factor		1.00	1.00	1.00	1.00		1.10	0.56		1.00	1.00	1.00
Incremental Delay, d2		14.7	1.4	1.6	0.1		7.3	0.3		2.2	2.3	0.1
Delay (s)		54.0	22.8	37.4	33.2		47.6	4.6		53.6	28.8	19.5
Level of Service		D	C	D	C		D	A		D	C	B
Approach Delay (s)		28.5			36.4			25.0			27.5	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

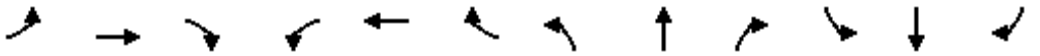
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1185	904	0	727	406	0	0	0	549	0	723
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0				4.5	4.5	4.5
Lane Util. Factor		0.95	1.00		0.95	1.00				0.95	0.95	1.00
Frpb, ped/bikes		1.00	0.99		1.00	0.98				1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00				1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95	0.95	1.00
Satd. Flow (prot)		3539	1564		3471	1580				1649	1649	1495
Flt Permitted		1.00	1.00		1.00	1.00				0.95	0.95	1.00
Satd. Flow (perm)		3539	1564		3471	1580				1649	1649	1495
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1261	962	0	773	432	0	0	0	584	0	769
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	79
Lane Group Flow (vph)	0	1261	962	0	773	432	0	0	0	292	292	690
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)			1			5						
Heavy Vehicles (%)	0%	2%	2%	0%	4%	0%	0%	0%	0%	4%	0%	8%
Turn Type		NA	Free		NA	Free				Split	NA	Prot
Protected Phases		2			6					4	4	4
Permitted Phases			Free			Free						
Actuated Green, G (s)		45.6	105.0		45.6	105.0				49.9	49.9	49.9
Effective Green, g (s)		46.6	105.0		46.6	105.0				49.9	49.9	49.9
Actuated g/C Ratio		0.44	1.00		0.44	1.00				0.48	0.48	0.48
Clearance Time (s)		5.0			5.0					4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1570	1564		1540	1580				783	783	710
v/s Ratio Prot		c0.36			0.22					0.18	0.18	c0.46
v/s Ratio Perm			0.62			0.27						
v/c Ratio		0.80	0.62		0.50	0.27				0.37	0.37	0.97
Uniform Delay, d1		25.2	0.0		20.9	0.0				17.6	17.6	26.9
Progression Factor		0.92	1.00		1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2		3.0	1.2		1.2	0.4				0.3	0.3	26.7
Delay (s)		26.3	1.2		22.1	0.4				17.9	17.9	53.6
Level of Service		C	A		C	A				B	B	D
Approach Delay (s)		15.5			14.3			0.0			38.2	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		

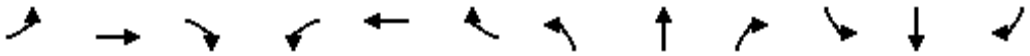
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	91	0	3	91	214	0	1	4	402	1	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97		0.99		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.88		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1701	1900		1805	1900	1456		1655		1719	1336	
Flt Permitted	0.69	1.00		0.69	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (perm)	1237	1900		1313	1900	1456		1655		1719	1336	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	91	102	0	3	102	240	0	1	4	452	1	103
RTOR Reduction (vph)	0	0	0	0	0	200	0	4	0	0	66	0
Lane Group Flow (vph)	91	102	0	3	102	40	0	1	0	452	38	0
Confl. Peds. (#/hr)	1					1			1	1		
Confl. Bikes (#/hr)			1			2						7
Heavy Vehicles (%)	6%	0%	0%	0%	0%	8%	0%	0%	0%	5%	0%	18%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases	2			6		6						
Actuated Green, G (s)	16.4	6.9		23.0	10.2	10.2		0.9		22.0	22.0	
Effective Green, g (s)	16.4	6.9		23.0	10.2	10.2		0.9		22.0	22.0	
Actuated g/C Ratio	0.27	0.11		0.38	0.17	0.17		0.01		0.36	0.36	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0		2.5		2.5	2.5	
Lane Grp Cap (vph)	407	216		602	319	245		24		624	485	
v/s Ratio Prot	c0.04	c0.05		c0.00	0.05			c0.00		c0.26	0.03	
v/s Ratio Perm	0.03			0.00		0.03						
v/c Ratio	0.22	0.47		0.00	0.32	0.16		0.04		0.72	0.08	
Uniform Delay, d1	17.4	25.1		11.7	22.2	21.6		29.4		16.7	12.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.2	1.6		0.0	0.6	0.3		0.6		3.9	0.1	
Delay (s)	17.6	26.8		11.7	22.7	21.9		30.0		20.6	12.7	
Level of Service	B	C		B	C	C		C		C	B	
Approach Delay (s)		22.4			22.0			30.0			19.1	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

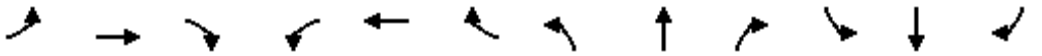
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	328	231	75	328	41	105	186	49	41	379	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1735		1752	1796		1770	1788		1766	1782	
Flt Permitted	0.28	1.00		0.13	1.00		0.12	1.00		0.53	1.00	
Satd. Flow (perm)	520	1735		244	1796		216	1788		994	1782	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	109	364	257	83	364	46	117	207	54	46	421	227
RTOR Reduction (vph)	0	26	0	0	5	0	0	9	0	0	20	0
Lane Group Flow (vph)	109	595	0	83	405	0	117	252	0	46	628	0
Confl. Peds. (#/hr)	1		2	2		1			3	3		
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	1%	2%	1%	3%	4%	2%	2%	2%	4%	2%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	37.6	31.0		36.2	30.3		40.6	34.5		36.8	32.6	
Effective Green, g (s)	37.6	31.0		36.2	30.3		40.6	34.5		36.8	32.6	
Actuated g/C Ratio	0.41	0.33		0.39	0.33		0.44	0.37		0.40	0.35	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.5		4.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	301	580		191	587		197	666		430	627	
v/s Ratio Prot	0.03	c0.34		c0.03	0.23		c0.04	0.14		0.00	c0.35	
v/s Ratio Perm	0.12			0.14			0.22			0.04		
v/c Ratio	0.36	1.03		0.43	0.69		0.59	0.38		0.11	1.00	
Uniform Delay, d1	18.7	30.8		21.9	27.1		21.0	21.2		17.3	30.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	44.1		1.6	3.5		4.7	0.4		0.1	36.3	
Delay (s)	19.4	74.9		23.5	30.6		25.7	21.6		17.4	66.3	
Level of Service	B	E		C	C		C	C		B	E	
Approach Delay (s)		66.7			29.4			22.9			63.1	
Approach LOS		E			C			C			E	

Intersection Summary			
HCM 2000 Control Delay	50.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	92.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	908	142	451	857	218	233	90	347	422	212	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0		5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.91		0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1687	3100		3467	3600	1347	1805	4600	1599	4000	1808	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1687	3100		3467	3600	1347	1805	4600	1599	4000	1808	
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)	52	936	146	465	884	225	240	93	358	435	219	64
RTOR Reduction (vph)	0	18	0	0	0	70	0	0	46	0	10	0
Lane Group Flow (vph)	52	1064	0	465	884	155	240	93	312	435	273	0
Confl. Peds. (#/hr)	5		5	5		5	2					2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	7%	3%	1%	1%	3%	16%	0%	1%	1%	3%	1%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		8	8	1	4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	7.0	33.6		17.7	44.3	44.3	18.5	18.5	36.2	20.2	20.2	
Effective Green, g (s)	7.0	34.6		17.7	45.3	45.3	18.5	18.5	36.2	20.2	20.2	
Actuated g/C Ratio	0.06	0.31		0.16	0.41	0.41	0.17	0.17	0.33	0.18	0.18	
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)	2.5	0.5		2.5	4.3	4.3	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	107	975		557	1482	554	303	773	598	734	332	
v/s Ratio Prot	0.03	c0.34		c0.13	0.25		c0.13	0.02	0.08	0.11	c0.15	
v/s Ratio Perm						0.12			0.11			
v/c Ratio	0.49	1.09		0.83	0.60	0.28	0.79	0.12	0.52	0.59	0.82	
Uniform Delay, d1	49.8	37.7		44.7	25.2	21.5	43.9	38.8	29.9	41.1	43.2	
Progression Factor	1.00	1.00		1.21	0.79	0.63	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.5	57.1		9.1	1.6	1.1	12.8	0.1	0.6	1.1	14.8	
Delay (s)	52.3	94.8		63.3	21.4	14.6	56.7	38.9	30.5	42.2	58.0	
Level of Service	D	F		E	C	B	E	D	C	D	E	
Approach Delay (s)		92.8			32.8			40.7			48.4	
Approach LOS		F			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	53.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	986	691	557	1052	0	0	0	0	408	1	477
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Lane Util. Factor		0.91	1.00	0.97	0.95					0.95	0.95	0.88
Frpb, ped/bikes		1.00	0.97	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1504	3467	3471					1715	1719	2682
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1504	3467	3471					1715	1719	2682
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1006	705	568	1073	0	0	0	0	416	1	487
RTOR Reduction (vph)	0	0	395	0	0	0	0	0	0	0	0	141
Lane Group Flow (vph)	0	1006	310	568	1073	0	0	0	0	208	209	346
Confl. Peds. (#/hr)	7		11	11		7	1					1
Confl. Bikes (#/hr)						3						1
Heavy Vehicles (%)	0%	2%	4%	1%	4%	0%	0%	0%	0%	0%	0%	6%
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		2		1	6					7	7	4
Permitted Phases			2									
Actuated Green, G (s)		37.5	37.5	27.5	69.5					31.5	31.5	31.5
Effective Green, g (s)		37.5	37.5	27.5	69.5					31.5	31.5	31.5
Actuated g/C Ratio		0.34	0.34	0.25	0.63					0.29	0.29	0.29
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		4.9	4.9	2.3	4.9					2.3	2.3	2.3
Lane Grp Cap (vph)		1733	512	866	2193					491	492	768
v/s Ratio Prot		0.20		c0.16	0.31					0.12	0.12	c0.13
v/s Ratio Perm			c0.21									
v/c Ratio		0.58	0.60	0.66	0.49					0.42	0.42	0.45
Uniform Delay, d1		29.8	30.1	37.0	10.8					31.9	31.9	32.2
Progression Factor		0.60	0.73	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.7	2.8	3.9	0.8					2.7	2.7	0.2
Delay (s)		18.6	24.6	40.9	11.6					34.5	34.6	32.4
Level of Service		B	C	D	B					C	C	C
Approach Delay (s)		21.1			21.7			0.0			33.4	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group