WILSONVILLE BARBER STREET MULTIFAMILY DEVELOPMENT

TRAFFIC IMPACT ANALYSIS (TIA)

SEPTEMBER 22, 2023

PREPARED FOR
CITY OF WILSONVILLE

WILSONVILLE OREGON

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TABLE OF CONTENTS

INTRODUCTION

This study evaluates the transportation impacts associated with the proposed commercial-retail (first floor) and multifamily residential building located at the South Metro Area Regional Transit (SMART) center in Wilsonville, Oregon. The property is an approximately 1.28-acre empty plot of land on the north side of Barber St and east of Kinsman Rd. The proposed development is a five-story building consisting of 121 affordable housing units and a brew pub/coffee shop and a community space on the ground floor. Because the project site is currently publicly owned land, no zone change will be required even though the site is currently zoned as Planned Development Industrial (PDI) which does not allow residential land use.

There is one existing site access and one proposed site access that will be used for exiting the property onto Barber St only. The existing site access is just west of the project site and leads to the existing parking lot north of the property. The new site access will be used to exit a proposed parking lot that is entered via the existing site access.

The purpose of this transportation study is to conduct a traffic impact analysis (TIA), which will identify any potential mitigation measures that might be needed to offset transportation impacts that the proposed development may have on the nearby transportation network in the near-term.

FIGURE 1: STUDY AREA

TRAFFIC IMPACT ANALYSIS (TIA)

The traffic impact analysis is focused on four existing intersections and one site access, which were selected for evaluation in coordination with City staff. The intersections are listed on the following page and shown in Figure 1. Important characteristics of the study area and proposed project are listed in Table 1.

1. SW Barber St / SW Kinsman Rd
2. SW Barber St / SMART Driveway
3. SW Barber St / SW Boones Ferry Rd
4. SW Wilsonville Rd / SW Kinsman Rd
5. SW Boones Ferry Rd / SW Wilsonville Rd

TABLE 1: STUDY AREA & DEVELOPMENT CHARACTERISTICS

STUDY AREA	
NUMBER OF STUDY INTERSECTIONS	Four existing intersections One existing site access
ANALYSIS PERIODS	Weekday PM peak hour (one hour between 4pm – 6pm)
PROPOSED DEVELOPMENT	
EXISTING LAND USE	Vacant
PROPOSED LAND USE	Commercial-retail and affordable housing
PROJECT TRIPS	71 total PM Peak Hour Trips (45 in, 26 out)
VEHICULAR ACCESS POINTS	One existing access point on Barber Street One proposed access point exit only onto Barber St

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.

STUDY AREA ROADWAY NETWORK

Key roadways and their existing characteristics in the study area are summarized in Table 2. The functional classifications for City of Wilsonville streets are provided in the City of Wilsonville Transportation System Plan (TSP).[a]

TABLE 2: STUDY AREA ROADWAY CHARACTERISTICS

ROADWAY	FUNCTIONAL CLASS	OWNER	LANES	POSTED SPEED	SIDE-WALKS	BICYCLE FACILITIES	ON-STREET PARKING
SW BARBER ST	Collector	City of Wilsonville	2	35 mph	Yes	Yes	No
SW WILSONVILLE RD	Major Arterial[b]	City of Wilsonville	4[c]	25 mph	Yes	Yes	No
SW BOONES FERRY RD	Collector	City of Wilsonville	2	35 mph	Partial	Partial	No
SW KINSMAN RD	Minor Arterial	City of Wilsonville	2	40 mph	Yes	Yes	No

Bicycle and Pedestrian Facilities

Near the project site, there are full on-street bicycle lanes along Barber St, Kinsman Rd, and Wilsonville Rd. On Boones Ferry Rd, there is only a bicycle lane on the west side of the Rd, however there is a shoulder on the east side of the road that bicycles could travel on. Additionally, the bicycle lanes on Wilsonville Rd, west of Kinsman Rd are buffered.

Sidewalks are present on Barber St, Kinsman Rd, and Wilsonville Rd. On Boones Ferry Rd, there is only a sidewalk on the west side of the road.

Public Transit Service

South Metro Area Regional Transit (SMART) provides public transportation services within Wilsonville and outlying areas. The Wilsonville Transit Center is located directly north of the project site. SMART provides bus service to Salem, Canby, and Tualatin. Additionally, Cherriots provides transit service from Keizer that stops in Woodburn and Wilsonville.

The Westside Express Service (WES) is a public commuter rail line that services Beaverton, Tigard, Tualatin, and Wilsonville. The WES station in Wilsonville shares a parking lot with the SMART Wilsonville Transit Center.

PLANNED PROJECTS

[a] Chapter 3: The Standards, Wilsonville Transportation System Plan, City of Wilsonville, Amended November 2020.

[b] Wilsonville Rd is classified as a Minor Arterial west of Kinsman Rd

[c] Wilsonville Rd in the project area has 2 travel lanes in both directions and includes additional turning lanes at intersections

The City of Wilsonville Transportation System Plan (TSP) has a list of Higher Priority projects which includes the recommended projects reasonably expected to be funded through 2035. These are the highest priority solutions to meet the City's most important needs. The list includes the following projects that impact the key roadways near the proposed project site.

- BW-03 (Boberg Road Bicycle Upgrade) – Fill in gaps in the sidewalk network on the east side of the roadway from Boeckman Road to Barber Street, and construct transit stop improvements.
- BW-09 (I-5 Bike / Pedestrian Bridge) - Construct Bike/Pedestrian Bridge over I-5 approximately aligned with Barber Street to improve connectivity of Town Center area with businesses and neighborhoods on west side of I-5; include aesthetic design treatments.
- SI-06 (Kinsman Road Sport Improvements) - Rebuild the northwest corner of the Wilsonville Road/Kinsman Road intersection to accommodate truck turning movements and improve pedestrian safety. Requires right-of-way acquisition, widening, pedestrian ramp replacement, and traffic signal pole relocation.

EXISTING TRAFFIC VOLUMES

New intersection turning movement count data was collected during the weekday PM peak period (4:00pm – 6:00pm) on Tuesday, August 8th, 2023, at the study intersections. Wilsonville experiences higher volumes during the school year, so historical counts collected on March 27th, 2023, were used to adjust the volumes to better represent true PM Peak Hour volumes. A 6.2% growth was applied to all the study intersection summer volumes.

Figure 2 shows the adjusted Existing PM peak hour traffic volumes for the study intersections, along with the lane configurations and traffic control.

INTERSECTION PERFORMANCE MEASURES

Agency mobility standards often require intersections to meet level of service (LOS) or volume-to-capacity (v/c) intersection operation thresholds.

- The intersection LOS is similar to a "report card" rating based upon average vehicle delay. Level of service A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. Level of service D and E are progressively worse operating conditions. Level of service F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity. This condition is typically evident in long queues and delays.
- The volume-to-capacity (v/c) ratio represents the level of saturation of the intersection or individual movement. It is determined by dividing the peak hour traffic volume by the maximum hourly capacity of an intersection or turn movement. When the V/C ratio approaches 0.95, operations become unstable and small disruptions can cause the traffic flow to break down, resulting in the formation of excessive queues.

The City of Wilsonville requires study intersections on public streets to meet its minimum acceptable level of service (LOS) standard of LOS D for the PM peak period.

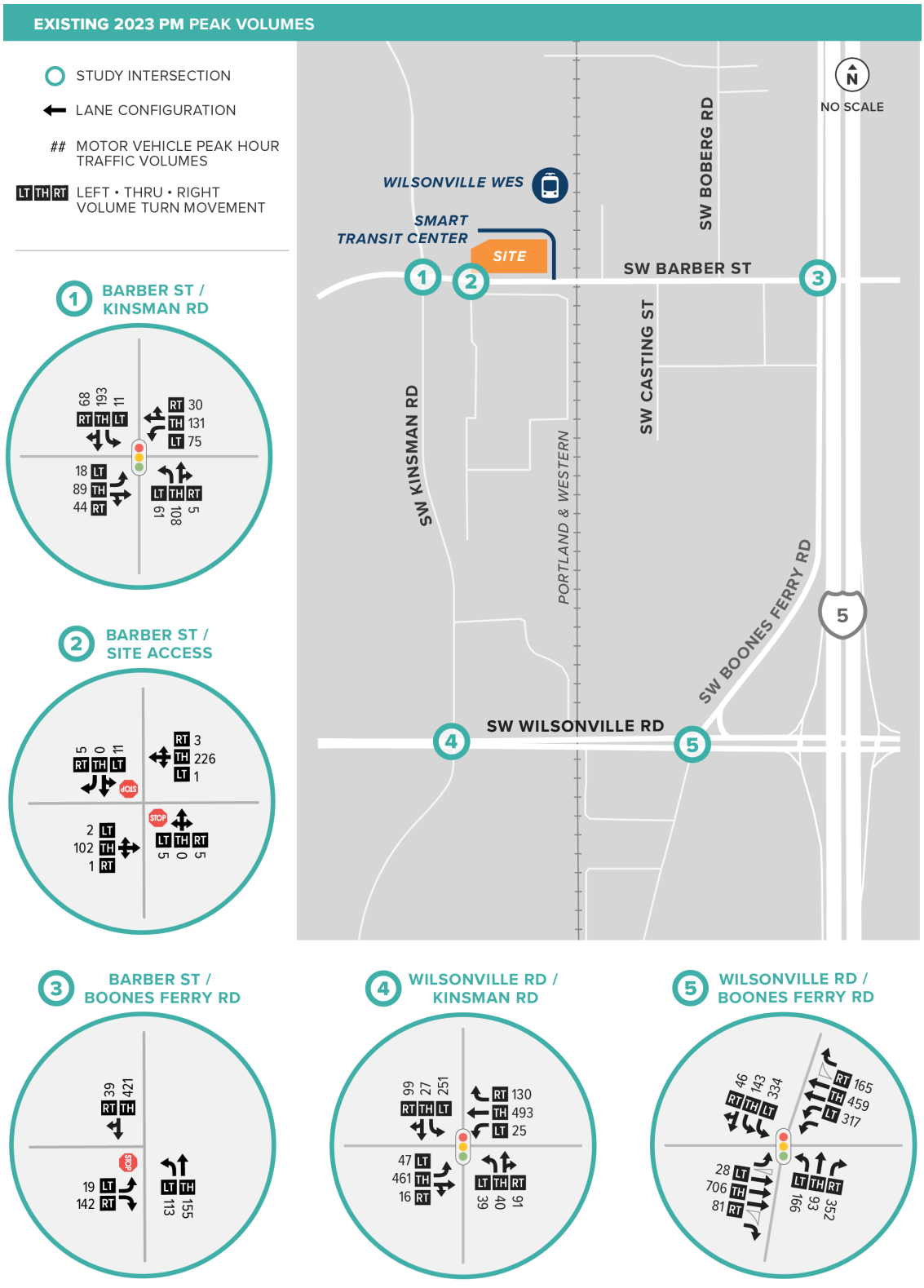


FIGURE 2: EXISTING PM PEAK HOUR TRAFFIC VOLUMES

EXISTING INTERSECTION OPERATIONS

Intersection operations were analyzed for the PM peak hour at all study intersections for the existing conditions using Highway Capacity Manual (HCM) 6th Edition methodology.[d] The volume to capacity (v/c) ratio, delay, and level of service (LOS) of each study intersection are listed in Table 3. As shown, all study intersections meet the applicable operating standards under existing conditions.

TABLE 3: EXISTING (2023) INTERSECTION OPERATIONS (PM PEAK)

INTERSECTION	OPERATING STANDARD	EXISTING PM PEAK HOUR		
		V/C	DELAY	LOS
SIGNALIZED				
BARBER RD / KINSMAN RD	LOS D	0.38	14	B
WILSONVILLE RD / BOONES FERRY RD	LOS D	0.58	34	C
WILSONVILLE RD / KINSMAN RD	LOS D	0.63	18	B
TWO-WAY STOP-CONTROLLED				
BARBER RD / BOONES FERRY RD	LOS D	0.32	15	C
BARBER RD / DRIVEWAY	LOS D	0.02	11.3	B

SIGNALIZED INTERSECTION:
Delay = Average Intersection Delay (secs)
v/c = Total Volume-to-Capacity Ratio
LOS = Total Level of Service

TWO-WAY STOP-CONTROLLED INTERSECTION:
Delay = Critical Movement Delay (secs)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Critical Levels of Service (Major/Minor Road)

PROJECT IMPACTS

This chapter reviews the impacts that the proposed development may have on the transportation system within the study area. This analysis includes trip generation, trip distribution, future traffic volume development, and operations analysis for the study intersections.

PROPOSED DEVELOPMENT

The proposed development is a new mixed-use building with affordable housing and commercial-retail space on the first floor located at 9749 SW Barber Street in Wilsonville. This development is adjacent to the Wilsonville SMART Transit Center and the Wilsonville WES Station. The building is a five-story transit-oriented development (TOD) consisting of 121 affordable housing units and a proposed brew pub/coffee shop and a community space on the ground floor.

[d] Highway Capacity Manual, 6th Edition, Transportation Research Board, 2017.

FUTURE ANALYSIS SCENARIOS

Operating conditions were analyzed at the study intersections for the following traffic scenarios. The comparison of the following scenarios enables the assessment of project impacts:

- Existing + Project
- Existing + Stage II
- Existing + Project + Stage II

All future analysis scenarios assume the same traffic control as existing conditions. Stage II represents traffic from other developments that have Stage II approval or are under construction in Wilsonville, which are based on the list of currently approved Stage II developments provided by City staff.[e]

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 (e.g., PM peak hour). The Institute of Transportation Engineers (ITE) publishes trip generation rates for the various land uses that can be applied to determine estimated traffic volumes.[f]

The public transit services that share a parking lot with the development impact the trip generation for the project. The Affordable Housing land use (ITE code 223) best describes the type of housing with this project but does not account for the nearby public transit. However, the Multifamily Housing land use (ITE code 221) does account for the nearby rail transit. To produce an accurate trip generation, the average between the two land uses were used.

TABLE 4: VEHICLE TRIP GENERATION RATES

LAND USE	ITE CODE	PM PEAK HOUR TRIP GENERATION RATE
Affordable Housing	223	0.46 trips per dwelling unit
Mid-Rise Multifamily Housing (close to rail transit)	221	0.29 trips per dwelling unit
Average	**221/223**	**0.375 trips per dwelling unit**

Table 4 shows the calculation of the final trip generation rate for the housing portion of the development. The average of ITE codes 223 and 221 produces a final trip generation rate of 0.375 trips per dwelling unit.

Table 5 shows the final trip generation. The High-Turnover (Sit-Down) Restaurant code (932) was used for the proposed brew pub/coffee shop on the ground floor. There is also a dedicated community space on the first floor, however given the hours of operation, this space is not anticipated to generate any trips during the PM peak hour. For the residential space, the average

[e] Provided via email from Daniel Pauly, City of Wilsonville, August 8th, 2023.

[f] Trip Generation Manual, 11th Edition, Institute of Transportation Engineers, 2021.

trip generation rate shown in Table 4 was used. The proposed project is estimated to generate a total of 71 new PM peak hour trips (45 in, 26 out).

TABLE 5: PROJECT VEHICLE TRIP GENERATION

LAND USE	ITE CODE	PM PEAK HOUR TRIP GENERATION RATE	PM PEAK HOUR VEHICLE TRIPS			
			SIZE	IN	OUT	TOTAL
Affordable / Mid-Rise Multifamily Housing	221/223	0.375 trips per dwelling unit	121 units	29	16	45
High-Turnover Restaurant	932	9.05 trips per KSF	2.85 KSF	16	10	26
			TOTAL TRIPS	**45**	**26**	**71**

VEHICLE TRIP DISTRIBUTION

Vehicle trip distribution provides an estimation of where vehicles would be coming from and going to. It is given as a percentage at key gateways to the study area and is used to route project trips through the study intersections. Figure 3 shows the trip distribution for the proposed site. The trip distribution for the passenger car trips was based on the existing volumes and traffic patterns.

The vehicle trips generated by the site expansion were distributed as follows:

- 60% east of the project site (to/from I-5, Wilsonville Road, etc)
- 10% south of the project site via Boones Ferry Road near Fred Meyer
- 10% north of the project site via Boones Ferry Road towards Boeckman Road
- 10% north of the project site via Kinsman Road towards Boeckman Road
- 5% west of the project site via Barber Street
- 5% west of the project site via Wilsonville Rd towards Brown Road

Project Trips Through City of Wilsonville I-5 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 as discussed prior. Approximately 60% of the vehicle project trips (43 trips) are expected to travel through the I-5/Wilsonville Road interchange area and approximately 0% of the project trips are expected to travel through the I-5/Elligsen Road interchange.

FUTURE TRAFFIC VOLUMES

Traffic volumes were estimated at the study intersections for the three future analysis scenarios previously listed using the various combinations of the three traffic types: Existing, Project, and Stage II. Figure 4 shows the Existing + Stage II PM peak hour traffic volumes. Figure 5 shows the Existing + Project PM peak hour traffic volumes. Figure 6 shows the Existing + Project + Stage II PM peak hour traffic volumes.

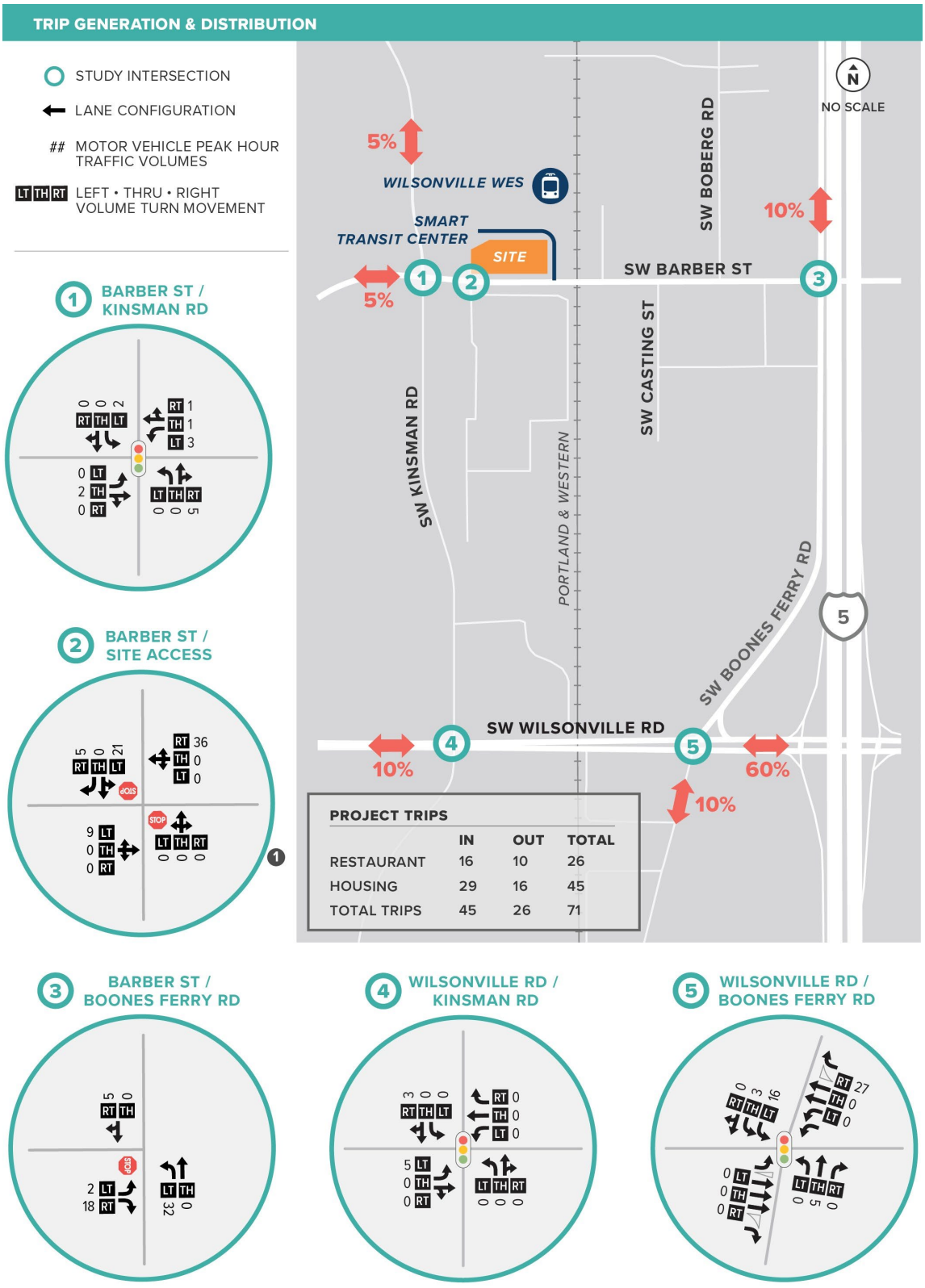


FIGURE 3: PROJECT TRIPS & TRIP DISTRIBUTION

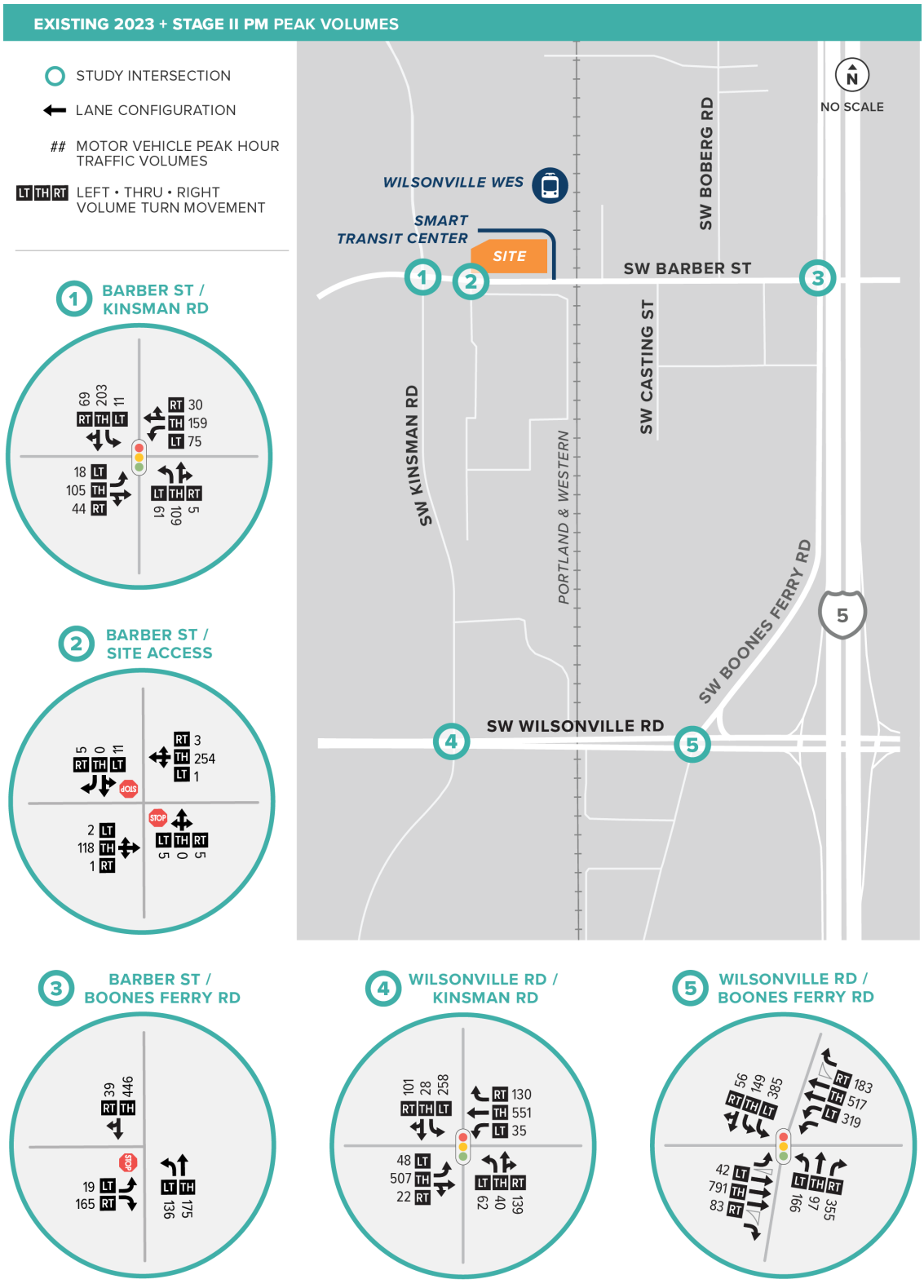


FIGURE 4: EXISTING + STAGE II TRAFFIC VOLUMES

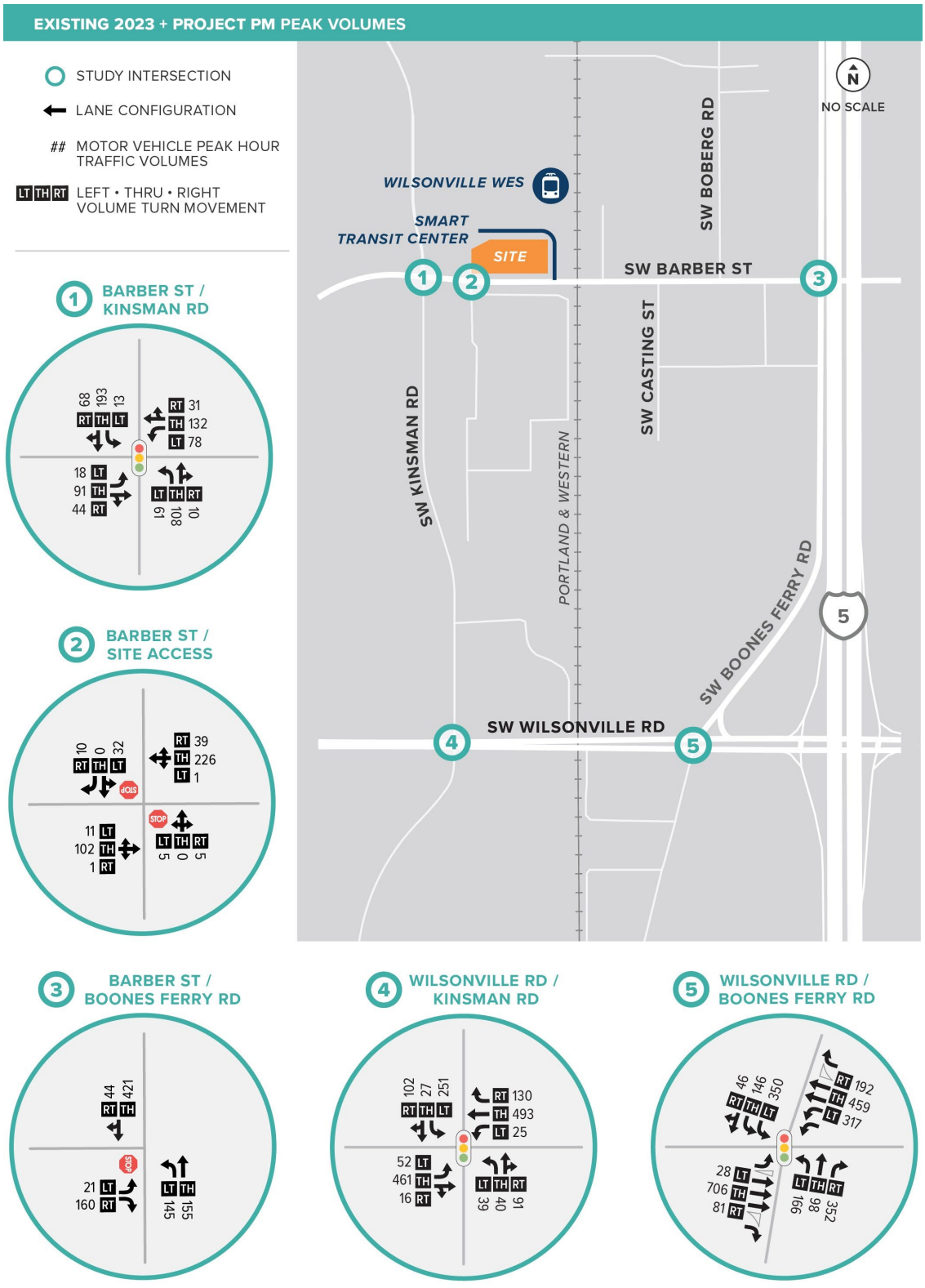


FIGURE 5: EXISTING + PROJECT TRAFFIC VOLUMES

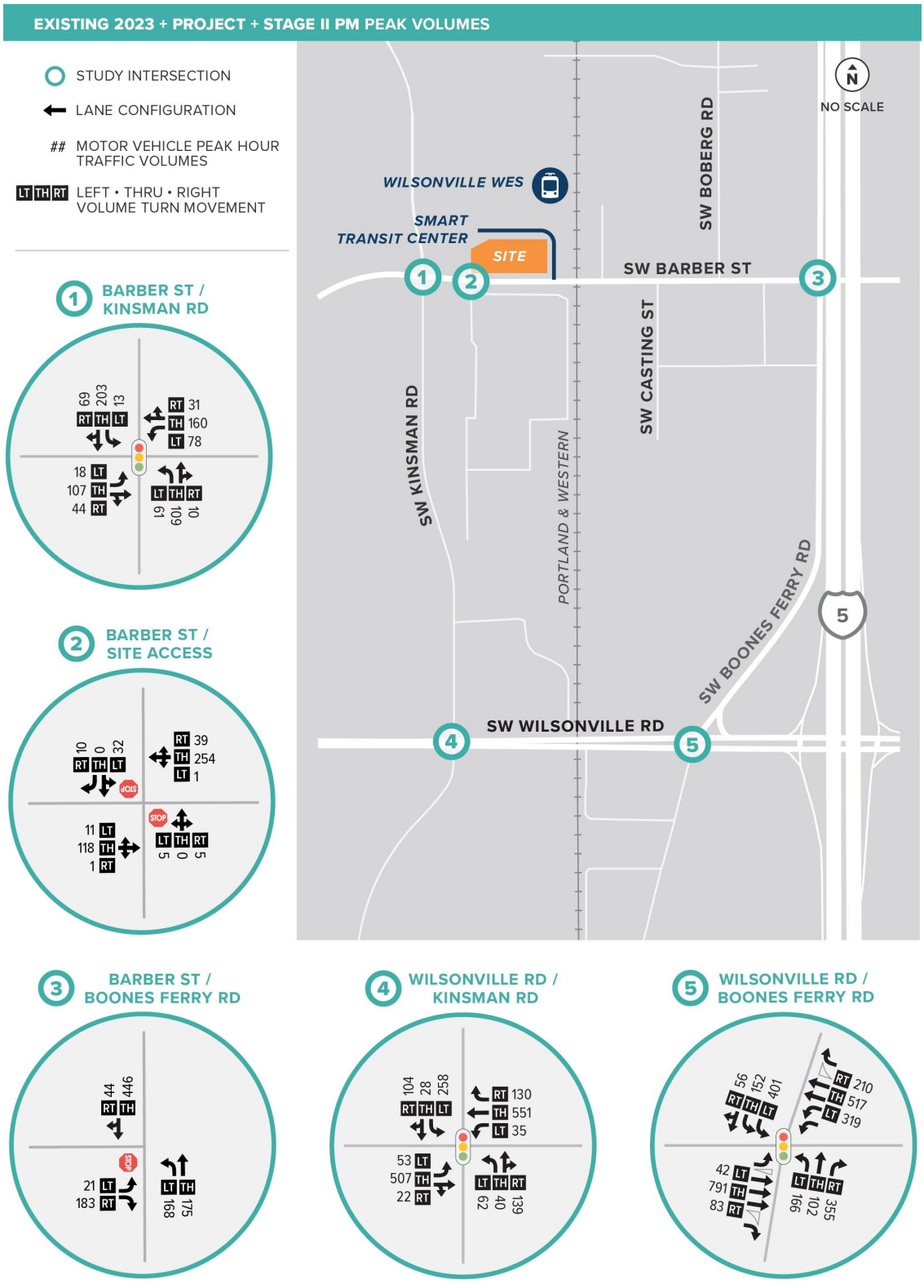


FIGURE 6: EXISTING + PROJECT + STAGE II TRAFFIC VOLUMES

FUTURE INTERSECTION OPERATIONS

Intersection operations were analyzed for the PM peak hour at all study intersections for the future scenarios using Highway Capacity Manual (HCM) 6th Edition methodology.[7] The volume to capacity (v/c) ratio, delay, and level of service (LOS) of each study intersection are listed in Table 6.

As shown, all study intersections meet the applicable operating standards under all future analysis scenarios.

TABLE 6: FUTURE INTERSECTION OPERATIONS (PM PEAK)

INTERSECTION	OPERATING STANDARD	EXISTING + STAGE II			EXISTING + PROJECT			EXISTING + STAGE II + PROJECT		
		V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS
SIGNALIZED										
BARBER RD / KINSMAN RD	LOS D	0.40	14.4	B	0.38	14	B	0.40	14.3	B
WILSONVILLE RD / BOONES FERRY RD	LOS D	0.62	35.2	D	0.58	35	C	0.62	35.4	D
WILSONVILLE RD / KINSMAN RD	LOS D	0.69	19.6	B	0.64	18	B	0.73	21.1	C
TWO-WAY STOP-CONTROLLED										
BARBER RD / BOONES FERRY RD	LOS D	0.38	17	C	0.37	16	C	0.43	18	C
BARBER RD / DRIVEWAY	LOS D	0.02	12	B	0.06	12	B	0.07	13	B

SIGNALIZED INTERSECTION:
Delay = Average Intersection Delay (secs)
v/c = Total Volume-to-Capacity Ratio
LOS = Total Level of Service

TWO-WAY STOP-CONTROLLED INTERSECTION:
Delay = Critical Movement Delay (secs)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Critical Levels of Service (Major/Minor Road)

[7] Highway Capacity Manual, 6th Edition, Transportation Research Board, 2017.

SITE PLAN REVIEW

This section reviews the project site plan for consistency with the Wilsonville Transportation System Plan and other applicable transportation standards, including the Wilsonville Development Code and Wilsonville Public Works Standards. The purpose of this review is to help identify any major site plan design concerns that could impact the greater project goals and could necessitate overall site plan changes. The site plan is provided in the appendix.

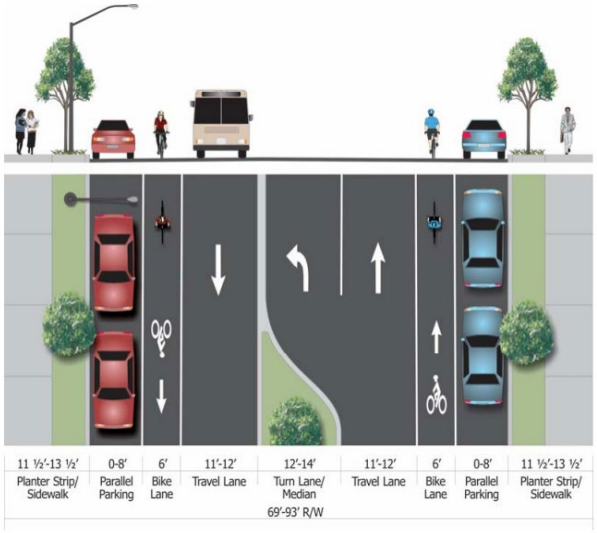
VEHICULAR SITE ACCESS

There are two proposed site accesses (driveway) for the project. One access is located on the existing driveway that currently provides access to the parking lot for the SMART Transit Center and the WES Rail Station. This access will be entry only. The second proposed site access will be an exit only onto Barber Street.

The exit only access point is required to meet the City's Access Spacing Standards for Collectors.[8] The access spacing for collectors is to be a minimum of 100 feet from centerline to centerline, but the desired spacing is 300 feet. The proposed exit only site access is approximately 190 feet from the SMART bus driveway to the west. The proposed spacing meets the minimum requirement.

DRIVEWAY ALIGNMENT

According to the City Public Works Standards Section 201.2.23(h), the City requires that proposed driveways be aligned with existing streets unless topography, existing features (tree protection) or geographic conditions doesn't allow for it. The proposed exit-only driveway on Barber Street does not align with the existing Coca Cola driveway on the south side of Barber Street based on the current site plan. Unless there are constraints due to existing features or geographic conditions, the driveway will need to be shifted to the east to align with the existing driveway.



COLLECTOR CROSS SECTION STANDARD

FRONTAGE IMPROVEMENTS

The project site shall provide street frontage improvements on Barber Street consistent with the City of Wilsonville's collector cross section standard, for which the roadways are classified as such.[9] Today, Barber Street fronting the project site has two travel lanes with a center turn lane, planter strip, sidewalk, and marked bike lanes fronting the project site. Based on the standards, the site

[9] Figure 3-8, Transportation System Plan, City of Wilsonville, Amended November 2020.
[9] Figure 3-8, Transportation System Plan, City of Wilsonville, Amended November 2020.

frontage is consistent with the cross section standard for collector streets. On-street parking is allowed on Collectors, but is not recommended for Barber Street.

ON-SITE CIRCULATION

The City requires that all modes of transportation have safe and convenient on-site circulation to the highest degree that the site practically allows.[10] There is a proposed one-way drive aisle on the south side of the project site that travels from the existing SMART driveway to an exit on Barber St. The one-way drive aisle contains 16 vehicle parking spaces and a crosswalk. Each area should maintain adequate circulation and safety for both vehicles and pedestrians. There appears to be adequate sidewalk surrounding the project site and crosswalks throughout parking areas.

For the existing parking lot, there appears to be sufficient aisle widths and turning radii to accommodate safe vehicle backing and parking maneuvers on site.

DRIVEWAY AISLE LENGTH

The City has minimum driveway aisle length standards.[11] For driveways with more than 100 average daily traffic (ADT), the drive aisle must be clear of parking stalls and intersecting drive aisles within 100 feet from the back of sidewalk. The proposed intersecting drive aisle appears to be approximately 4-6 feet from the back of the sidewalk. It is recommended that the driveway aisle be extended to provide a minimum of 20 feet (approximately one car length) so that an inbound vehicle will not block the SMART driveway if stopped in the drive aisle.

SUMMARY

The key findings of the transportation impact analysis (TIA).

- The proposed project is a mixed-use development consisting of a five-story building with 121 housing units and a proposed brew pub/coffee shop and a community space on the ground floor..
- The proposed development is expected to generate 71 (45 in, 26 out) PM peak hour vehicle trips, and 60% of those trips (43 vehicles) are expected to travel through the Wilsonville Road / I-5 interchange.
- The traffic operations at the five study intersections are expected to operate within the City's LOS standard under all future volume conditions.
- The proposed exit only driveway on Barber Street will need to be shifted to the east to align with the existing driveway unless there are constraints due to existing features or geographic conditions.
- It is recommended that the driveway aisle be extended to provide a minimum of 20 feet (approximately one car length) to provide sufficient clear drive aisle length.

[10] Section 4.421, Wilsonville Development Code, Updated March 2023.
[11] Section 201.2.23 (Driveways), Public Works Standards, City of Wilsonville, Revised September 2017.

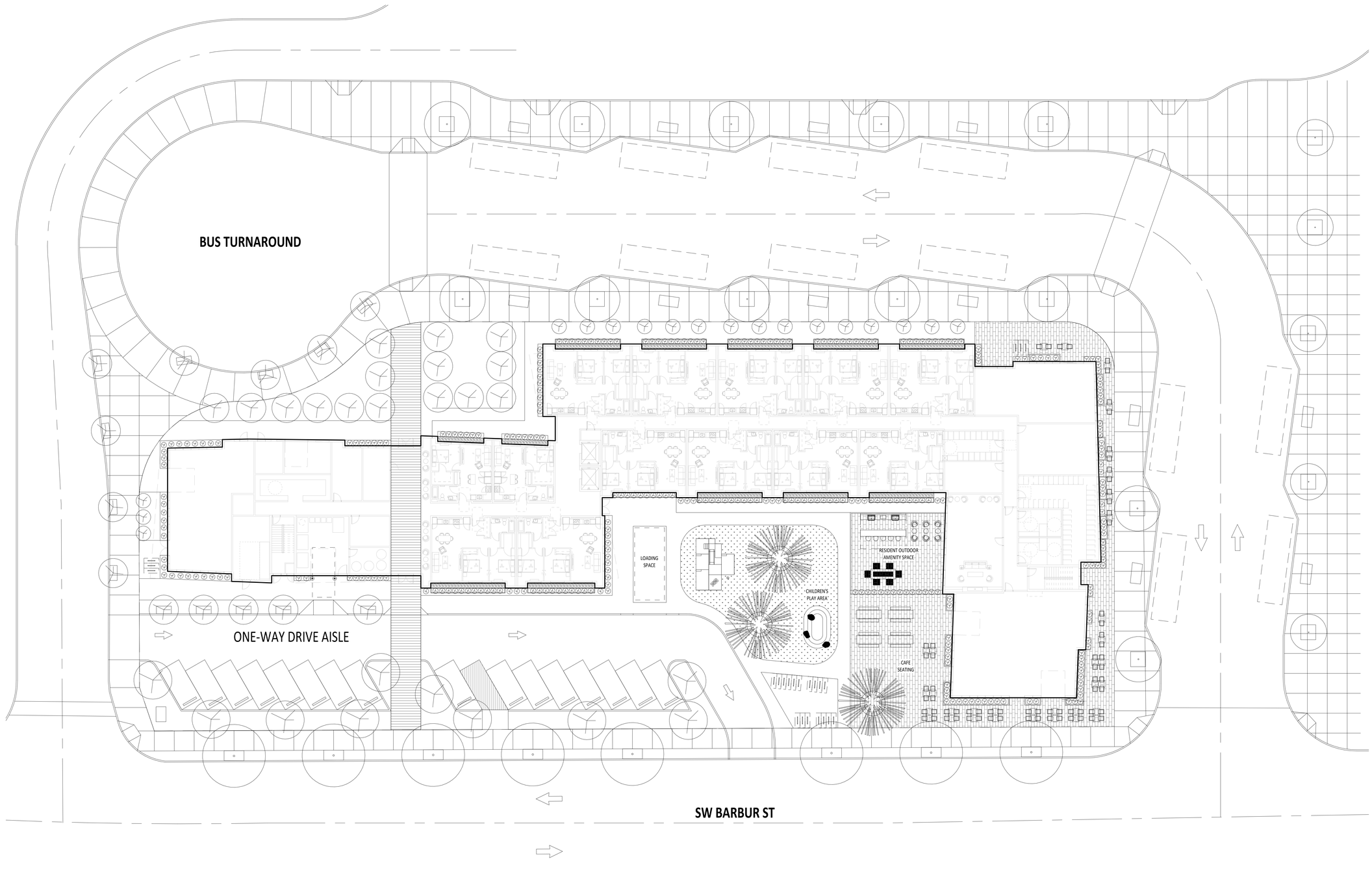
APPENDIX

APPENDIX A: SITE PLAN

KEY NOTES

GENERAL NOTES - SITE PLAN

1. FIELD VERIFY ALL INFORMATION PRIOR TO CONSTRUCTION. IF SITE CONDITIONS VARY FROM CONTRACT DOCUMENTS, NOTIFY ARCHITECT IN WRITING IMMEDIATELY.



1 A080 SITE PLAN
1/16" = 1'-0"

YBA architects
3514 N VANCOUVER AVE SUITE 310 - PORTLAND, OR 97227
T: 971.888.5107 - E-MAIL: INFO@YB-A.COM

STAMP

FOR REFERENCE ONLY

SHEET REVISION NO.	REVISION EVENT	REVISION DATE

TRUE NORTH PLAN NORTH

WILSONVILLE TOD

PALINDROME COMMUNITIES

ISSUANCE
100% SCHEMATIC DESIGN

PROJECT NUMBER
220120

DATE
06/05/23

FULL SHEET SIZE
30 X 42

DRAWING TITLE
ARCHITECTURAL SITE PLAN

SHEET NUMBER
A080

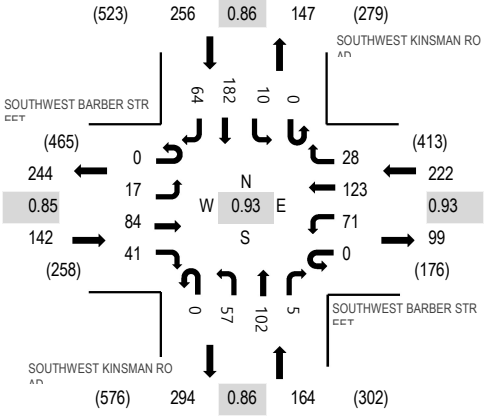
APPENDIX B: TRAFFIC COUNT DATA

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

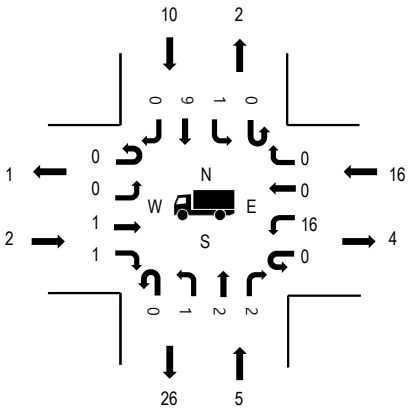
Location: 1 SOUTHWEST KINSMAN ROAD & SOUTHWEST BARBER STREET PM
Date: Tuesday, August 1, 2023
Peak Hour: 04:40 PM - 05:40 PM
Peak 15-Minutes: 05:20 PM - 05:35 PM

Peak Hour

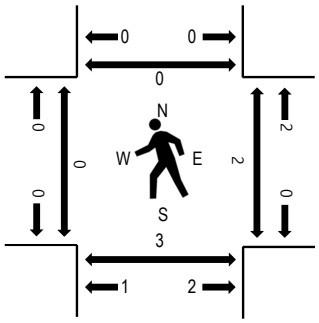
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.4%	0.85
WB	7.2%	0.93
NB	3.0%	0.86
SB	3.9%	0.86
All	4.2%	0.93

Traffic Counts - Motorized Vehicles

Interval Start Time	SOUTHWEST BARBER STREET Eastbound				SOUTHWEST BARBER STREET Westbound				SOUTHWEST KINSMAN ROAD Northbound				SOUTHWEST KINSMAN ROAD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	3	8	3	0	7	13	1	0	4	5	2	0	1	13	0	60	762
4:05 PM	0	3	0	3	0	5	12	1	0	3	9	1	0	0	10	3	50	757
4:10 PM	0	2	5	3	0	7	14	3	0	3	7	0	0	0	23	9	76	769
4:15 PM	0	2	6	1	0	7	11	4	0	4	6	0	0	0	17	6	64	756
4:20 PM	0	3	3	2	0	4	8	0	0	4	13	0	0	1	20	3	61	747
4:25 PM	0	3	4	0	0	5	5	4	0	4	9	0	0	1	18	5	58	769
4:30 PM	0	2	7	4	0	4	7	4	0	3	8	0	0	1	17	7	64	776
4:35 PM	0	0	3	3	0	8	6	2	0	5	10	2	0	0	20	4	63	775
4:40 PM	0	1	11	3	0	8	16	2	0	4	7	0	0	0	17	5	74	784
4:45 PM	0	0	8	5	0	3	7	3	0	4	7	0	0	1	14	8	60	763
4:50 PM	0	0	9	5	0	10	9	2	0	4	6	3	0	1	11	4	64	759
4:55 PM	0	2	7	3	0	5	9	0	0	7	11	0	0	2	19	3	68	746
5:00 PM	0	0	6	3	0	8	6	2	0	3	12	1	0	1	10	3	55	734
5:05 PM	0	2	6	1	0	8	7	5	0	2	8	1	0	0	16	6	62	
5:10 PM	0	0	7	3	0	5	15	1	0	5	9	0	0	1	16	1	63	
5:15 PM	0	3	1	4	0	1	14	2	0	8	7	0	0	0	10	5	55	
5:20 PM	0	3	7	3	0	3	9	3	0	7	14	0	0	2	21	11	83	
5:25 PM	0	1	9	5	0	5	9	3	0	4	10	0	0	1	16	2	65	
5:30 PM	0	1	9	3	0	7	9	2	0	4	5	0	0	0	15	8	63	
5:35 PM	0	4	4	3	0	8	13	3	0	5	6	0	0	1	17	8	72	
5:40 PM	0	2	6	4	0	5	9	0	0	3	6	0	0	1	7	10	53	
5:45 PM	0	0	5	3	0	4	7	3	0	6	5	0	0	1	14	8	56	
5:50 PM	0	2	8	4	0	3	6	1	0	7	1	1	0	1	11	6	51	
5:55 PM	0	1	8	0	0	3	6	2	0	2	5	0	0	1	20	8	56	
Count Total	0	40	147	71	0	133	227	53	0	105	186	11	0	18	372	133	1,496	
Peak Hour	0	17	84	41	0	71	123	28	0	57	102	5	0	10	182	64	784	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	1	1	1	4	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	1	1	0	2	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	1	2	3	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	1	0	2	0	3	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	0	1	2	3	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	2	1	3	4:25 PM	0	0	0	1	1	4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	3	3	4:30 PM	0	0	0	0	0	4:30 PM	0	1	0	0	1
4:35 PM	1	2	2	1	6	4:35 PM	0	0	0	1	1	4:35 PM	0	0	1	0	1
4:40 PM	1	0	0	1	2	4:40 PM	0	0	0	0	0	4:40 PM	0	1	1	0	2
4:45 PM	0	0	0	2	2	4:45 PM	0	0	1	1	2	4:45 PM	0	0	0	0	0
4:50 PM	0	1	1	2	4	4:50 PM	0	0	0	0	0	4:50 PM	1	1	0	0	2
4:55 PM	1	1	2	0	4	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	1	1	0	2	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	1	2	1	4	5:05 PM	0	0	0	1	1	5:05 PM	0	0	0	0	0
5:10 PM	0	0	1	0	1	5:10 PM	0	1	0	1	2	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	2	2	4	5:20 PM	0	0	1	1	2	5:20 PM	0	0	0	0	0
5:25 PM	0	1	2	1	4	5:25 PM	0	0	0	0	0	5:25 PM	0	0	1	0	1
5:30 PM	0	0	2	0	2	5:30 PM	0	0	0	0	0	5:30 PM	0	1	0	0	1
5:35 PM	0	0	3	1	4	5:35 PM	0	0	0	1	1	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	2	2	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	1	1	2	5:55 PM	0	0	0	1	1	5:55 PM	0	1	0	0	1
Count Total	5	9	27	23	64	Count Total	0	1	2	8	11	Count Total	1	5	3	0	9
Peak Hour	2	5	16	10	33	Peak Hour	0	1	2	5	8	Peak Hour	1	3	2	0	6

ALL TRAFFIC DATA SERVICES
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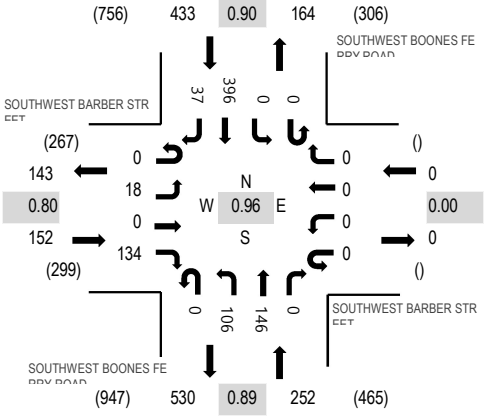
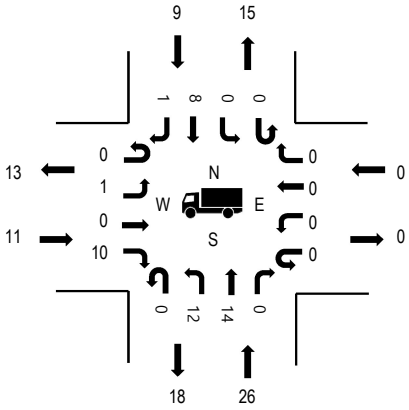
Location: 2 SOUTHWEST BOONES FERRY ROAD & SOUTHWEST BARBER STREET PM
Date: Tuesday, August 1, 2023
Peak Hour: 04:05 PM - 05:05 PM
Peak 15-Minutes: 04:30 PM - 04:45 PM

Peak Hour

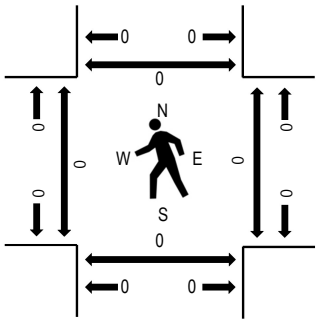
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	7.2%	0.80
WB	0.0%	0.00
NB	10.3%	0.89
SB	2.1%	0.90
All	5.5%	0.96

Traffic Counts - Motorized Vehicles

Interval Start Time	SOUTHWEST BARBER STREET Eastbound				SOUTHWEST BARBER STREET Westbound				SOUTHWEST BOONES FERRY ROAD Northbound				SOUTHWEST BOONES FERRY ROAD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	2	0	8	0	0	0	0	0	11	7	0	0	0	24	2	54	819
4:05 PM	0	2	0	16	0	0	0	0	0	11	14	0	0	0	26	2	71	837
4:10 PM	0	2	0	12	0	0	0	0	0	8	9	0	0	0	38	4	73	831
4:15 PM	0	2	0	8	0	0	0	0	0	14	8	0	0	0	30	6	68	824
4:20 PM	0	2	0	7	0	0	0	0	0	12	10	0	0	0	42	1	74	815
4:25 PM	0	0	0	6	0	0	0	0	0	11	16	0	0	0	39	1	73	793
4:30 PM	0	0	0	14	0	0	0	0	0	6	9	0	0	0	36	2	67	780
4:35 PM	0	2	0	13	0	0	0	0	0	7	11	0	0	0	36	5	74	794
4:40 PM	0	0	0	10	0	0	0	0	0	9	19	0	0	0	38	1	77	779
4:45 PM	0	3	0	12	0	0	0	0	0	9	7	0	0	0	25	2	58	754
4:50 PM	0	2	0	7	0	0	0	0	0	6	12	0	0	0	32	4	63	748
4:55 PM	0	1	0	15	0	0	0	0	0	6	19	0	0	0	21	5	67	727
5:00 PM	0	2	0	14	0	0	0	0	0	7	12	0	0	0	33	4	72	701
5:05 PM	0	2	0	12	0	0	0	0	0	10	10	0	0	0	26	5	65	
5:10 PM	0	2	0	13	0	0	0	0	0	7	12	0	0	0	29	3	66	
5:15 PM	0	2	0	6	0	0	0	0	0	8	16	0	0	0	26	1	59	
5:20 PM	0	0	0	8	0	0	0	0	0	9	9	0	0	0	22	4	52	
5:25 PM	0	5	0	15	0	0	0	0	0	7	6	0	0	0	25	2	60	
5:30 PM	0	4	0	14	0	0	0	0	0	12	13	0	0	0	36	2	81	
5:35 PM	0	0	0	13	0	0	0	0	0	10	15	0	0	0	20	1	59	
5:40 PM	0	2	0	10	0	0	0	0	0	6	7	0	0	0	22	5	52	
5:45 PM	0	2	0	10	0	0	0	0	0	5	10	0	0	0	23	2	52	
5:50 PM	0	1	0	8	0	0	0	0	0	3	10	0	0	0	19	1	42	
5:55 PM	0	1	0	7	0	0	0	0	0	6	4	0	0	0	21	2	41	
Count Total	0	41	0	258	0	0	0	0	0	200	265	0	0	0	689	67	1,520	
Peak Hour	0	18	0	134	0	0	0	0	0	106	146	0	0	0	396	37	837	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	2	0	0	2	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	3	2	0	1	6	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	3	0	1	4	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	4	0	1	5	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	1	0	3	4	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	4	0	1	5	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	0	0	1	2	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	2	0	0	0	2	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	1	3	0	0	4	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	4	0	0	4	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	2	0	0	2	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	2	2	0	1	5	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	2	1	0	0	3	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	1	2	0	0	3	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	3	0	0	3	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	5	0	0	5	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	3	0	2	5	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	2	0	0	2	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	1	4	0	0	5	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	1	0	0	0	1	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	1	0	1	2	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	4	0	1	5	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	1	0	0	1	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	14	53	0	13	80	Count Total	0	0	0	0	0	Count Total	0	0	0	0	0
Peak Hour	11	26	0	9	46	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
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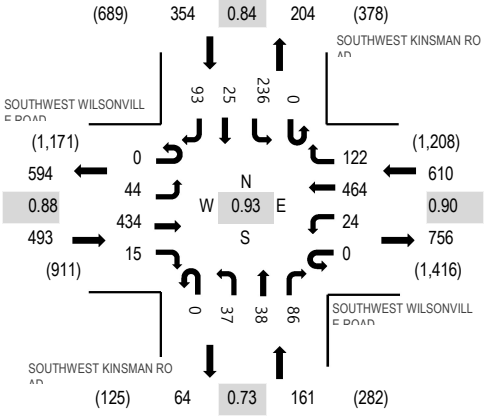
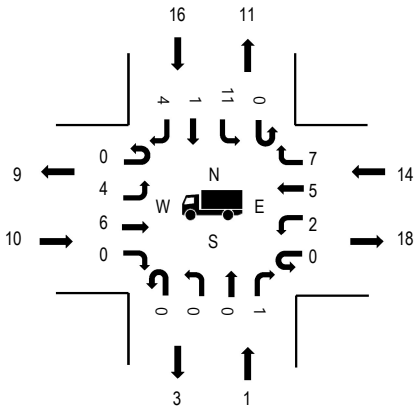
Location: 3 SOUTHWEST KINSMAN ROAD & SOUTHWEST WILSONVILLE ROAD PM
Date: Tuesday, August 1, 2023
Peak Hour: 04:35 PM - 05:35 PM
Peak 15-Minutes: 05:05 PM - 05:20 PM

Peak Hour

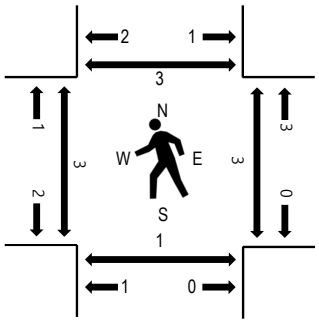
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.0%	0.88
WB	2.3%	0.90
NB	0.6%	0.73
SB	4.5%	0.84
All	2.5%	0.93

Traffic Counts - Motorized Vehicles

Interval Start Time	SOUTHWEST WILSONVILLE ROAD Eastbound				SOUTHWEST WILSONVILLE ROAD Westbound				SOUTHWEST KINSMAN ROAD Northbound				SOUTHWEST KINSMAN ROAD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	3	44	0	0	0	45	8	0	5	4	18	0	16	4	10	157	1,534
4:05 PM	0	2	26	4	0	3	40	9	0	0	4	14	0	10	0	11	123	1,491
4:10 PM	0	5	33	4	0	1	39	10	0	0	2	6	0	28	4	10	142	1,514
4:15 PM	0	2	30	0	0	2	39	12	0	1	2	6	0	16	2	7	119	1,518
4:20 PM	0	1	27	0	0	4	35	8	0	1	2	2	0	28	2	7	117	1,543
4:25 PM	0	2	31	1	0	0	46	11	0	3	2	7	0	10	4	6	123	1,570
4:30 PM	0	2	27	0	0	2	22	9	0	5	1	5	0	16	5	3	97	1,586
4:35 PM	0	7	43	1	0	0	38	11	0	5	5	5	0	21	2	10	148	1,618
4:40 PM	0	1	35	0	0	5	41	12	0	3	0	7	0	17	1	7	129	1,610
4:45 PM	0	6	35	6	0	1	40	10	0	2	1	7	0	20	1	10	139	1,613
4:50 PM	0	3	40	2	0	2	28	10	0	2	1	7	0	19	2	6	122	1,580
4:55 PM	0	2	31	0	0	4	33	11	0	0	4	8	0	14	3	8	118	1,565
5:00 PM	0	5	27	0	0	0	36	10	0	0	4	6	0	14	1	11	114	1,556
5:05 PM	0	2	29	1	0	2	38	8	0	6	6	15	0	27	3	9	146	
5:10 PM	0	2	42	2	0	2	49	10	0	7	3	2	0	20	1	6	146	
5:15 PM	0	6	41	1	0	2	39	10	0	6	4	6	0	24	3	2	144	
5:20 PM	0	1	45	0	0	3	44	12	0	2	3	9	0	16	0	9	144	
5:25 PM	0	4	32	1	0	2	36	11	0	3	2	8	0	25	5	10	139	
5:30 PM	0	5	34	1	0	1	42	7	0	1	5	6	0	19	3	5	129	
5:35 PM	0	7	34	1	0	2	37	10	0	2	2	4	0	29	2	10	140	
5:40 PM	0	4	43	0	0	0	50	10	0	0	1	2	0	11	0	11	132	
5:45 PM	0	1	25	0	0	1	35	8	0	2	2	4	0	17	4	7	106	
5:50 PM	0	1	33	1	0	3	36	9	0	0	0	1	0	13	2	8	107	
5:55 PM	0	5	19	0	0	2	40	10	0	1	3	7	0	18	1	3	109	
Count Total	0	79	806	26	0	44	928	236	0	57	63	162	0	448	55	186	3,090	
Peak Hour	0	44	434	15	0	24	464	122	0	37	38	86	0	236	25	93	1,618	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	2	0	0	4	6	4:00 PM	0	0	0	0	0	4:00 PM	0	1	0	0	1
4:05 PM	0	2	3	0	5	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	1	0	3	3	7	4:10 PM	0	0	0	0	0	4:10 PM	0	3	0	0	3
4:15 PM	2	0	1	1	4	4:15 PM	0	0	0	0	0	4:15 PM	0	1	0	3	4
4:20 PM	0	0	1	1	2	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	1	1
4:25 PM	0	1	1	2	4	4:25 PM	0	0	0	0	0	4:25 PM	0	1	0	0	1
4:30 PM	2	0	1	2	5	4:30 PM	0	0	0	0	0	4:30 PM	0	0	2	0	2
4:35 PM	2	1	1	3	7	4:35 PM	0	0	0	0	0	4:35 PM	1	1	0	0	2
4:40 PM	2	0	2	0	4	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	1	0	1	1	3	4:45 PM	0	0	0	0	0	4:45 PM	0	0	1	1	2
4:50 PM	0	0	1	1	2	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	4	4
4:55 PM	0	0	2	1	3	4:55 PM	0	1	0	0	1	4:55 PM	1	1	0	0	2
5:00 PM	1	0	4	2	7	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	2	0	2	1	5	5:05 PM	0	0	0	0	0	5:05 PM	0	1	0	0	1
5:10 PM	0	0	0	1	1	5:10 PM	0	0	0	0	0	5:10 PM	0	0	1	0	1
5:15 PM	1	0	1	0	2	5:15 PM	0	0	0	2	2	5:15 PM	0	0	1	0	1
5:20 PM	1	0	0	2	3	5:20 PM	2	0	0	0	2	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	2	2	5:25 PM	0	0	0	0	0	5:25 PM	2	0	0	0	2
5:30 PM	0	0	0	2	2	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	1	0	0	1	2	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	2	2	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	1	1	2	0	4	5:45 PM	0	0	0	0	0	5:45 PM	0	0	2	0	2
5:50 PM	0	0	0	1	1	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	2	2	4	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	19	5	28	35	87	Count Total	2	1	0	2	5	Count Total	4	9	7	9	29
Peak Hour	10	1	14	16	41	Peak Hour	2	1	0	2	5	Peak Hour	4	3	3	5	15

ALL TRAFFIC DATA SERVICES
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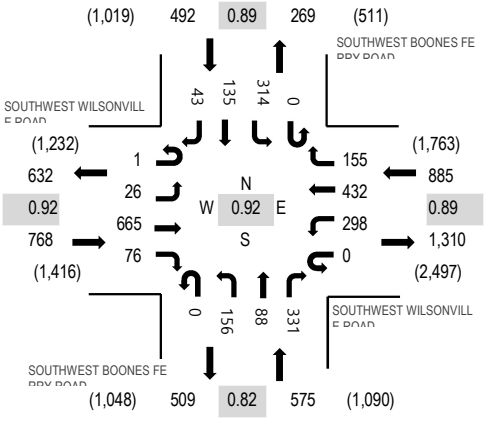
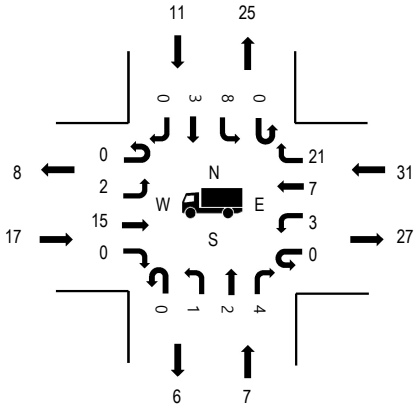
Location: 4 SOUTHWEST BOONES FERRY ROAD & SOUTHWEST WILSONVILLE ROAD PM
Date: Tuesday, August 1, 2023
Peak Hour: 04:35 PM - 05:35 PM
Peak 15-Minutes: 05:05 PM - 05:20 PM

Peak Hour

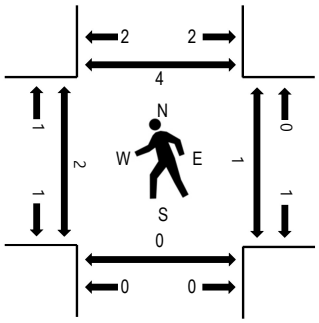
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.2%	0.92
WB	3.5%	0.89
NB	1.2%	0.82
SB	2.2%	0.89
All	2.4%	0.92

Traffic Counts - Motorized Vehicles

Interval Start Time	SOUTHWEST WILSONVILLE ROAD Eastbound				SOUTHWEST WILSONVILLE ROAD Westbound				SOUTHWEST BOONES FERRY ROAD Northbound				SOUTHWEST BOONES FERRY ROAD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	48	2	0	26	38	16	0	11	10	34	0	29	9	4	227	2,645
4:05 PM	0	1	58	3	0	23	30	18	0	10	6	31	0	26	11	5	222	2,637
4:10 PM	0	1	57	2	0	21	48	12	0	8	5	27	0	19	22	4	226	2,680
4:15 PM	0	1	53	5	0	36	36	9	0	14	6	31	0	26	14	2	233	2,704
4:20 PM	0	4	34	2	0	24	33	15	0	9	8	33	0	19	23	4	208	2,694
4:25 PM	0	0	53	3	0	17	35	3	0	14	7	18	0	38	20	5	213	2,704
4:30 PM	0	3	47	3	0	32	30	14	0	10	5	27	0	28	16	2	217	2,704
4:35 PM	0	2	64	7	0	22	38	10	0	14	6	23	0	25	12	5	228	2,720
4:40 PM	0	4	42	2	0	28	25	5	0	15	13	24	0	26	18	4	206	2,710
4:45 PM	0	1	45	3	0	22	41	16	0	10	4	31	0	20	17	2	212	2,716
4:50 PM	0	2	72	3	0	42	39	12	0	12	6	29	0	20	10	5	252	2,700
4:55 PM	1	1	46	4	0	17	29	14	0	8	10	30	0	25	8	8	201	2,659
5:00 PM	0	2	47	11	0	20	19	11	0	23	8	30	0	30	15	3	219	2,643
5:05 PM	0	1	65	10	0	27	37	16	0	14	5	32	0	42	11	5	265	
5:10 PM	0	3	62	4	0	27	42	13	0	16	13	43	0	15	10	2	250	
5:15 PM	0	4	50	11	0	20	26	16	0	13	8	26	0	33	13	3	223	
5:20 PM	0	1	58	12	0	19	48	8	0	13	5	20	0	25	7	2	218	
5:25 PM	0	3	66	5	0	19	46	21	0	6	3	15	0	20	7	2	213	
5:30 PM	0	2	48	4	0	35	42	13	0	12	7	28	0	33	7	2	233	
5:35 PM	0	6	47	11	0	32	22	6	0	9	6	22	0	30	23	4	218	
5:40 PM	0	0	47	8	0	15	48	14	0	12	4	18	0	27	16	3	212	
5:45 PM	1	2	48	8	0	24	38	14	0	6	6	25	0	17	6	1	196	
5:50 PM	0	2	42	7	0	29	35	15	0	16	4	24	0	30	7	0	211	
5:55 PM	0	0	32	7	0	19	36	15	0	15	4	20	0	22	13	2	185	
Count Total	2	46	1,231	137	0	596	861	306	0	290	159	641	0	625	315	79	5,288	
Peak Hour	1	26	665	76	0	298	432	155	0	156	88	331	0	314	135	43	2,720	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	1	3	1	6	4:00 PM	0	0	0	0	0	4:00 PM	2	0	0	0	2
4:05 PM	3	0	4	2	9	4:05 PM	0	0	0	0	0	4:05 PM	0	0	1	2	3
4:10 PM	2	1	3	2	8	4:10 PM	0	0	0	0	0	4:10 PM	1	0	0	1	2
4:15 PM	2	1	3	1	7	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	2	3	2	7	4:20 PM	0	0	0	0	0	4:20 PM	0	1	1	1	3
4:25 PM	2	0	2	0	4	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	1	2	2	6	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	2	0	1	3	6	4:35 PM	0	0	0	0	0	4:35 PM	0	0	1	0	1
4:40 PM	4	0	5	1	10	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	2	1	3	1	7	4:45 PM	0	0	0	0	0	4:45 PM	1	0	0	2	3
4:50 PM	0	2	2	0	4	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	1	1
4:55 PM	1	0	2	1	4	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	1	1	3	1	6	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	2	0	3	1	6	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	2	0	2	1	5	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	2	5	0	7	5:15 PM	0	0	0	0	0	5:15 PM	1	0	0	0	1
5:20 PM	1	0	0	1	2	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	1	0	4	0	5	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	1	1	1	1	4	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	1	1
5:35 PM	1	0	0	1	2	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	2	0	5	1	8	5:40 PM	0	0	0	0	0	5:40 PM	2	0	0	0	2
5:45 PM	2	2	4	1	9	5:45 PM	0	0	0	0	0	5:45 PM	0	0	1	0	1
5:50 PM	2	0	3	1	6	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	1	3	0	4	5:55 PM	0	0	1	0	1	5:55 PM	0	0	0	1	1
Count Total	35	16	66	25	142	Count Total	0	0	1	0	1	Count Total	7	1	4	9	21
Peak Hour	17	7	31	11	66	Peak Hour	0	0	0	0	0	Peak Hour	2	0	1	4	7

APPENDIX C: STAGE II LIST

Updated by D. Pauly 08.09.23

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
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
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.*	*High Turnover Restaurant (Pad 1)	Not built	7.5 KSF				24	17	47*
	Remaining Approved Total								47
Wilsonville Road Business Park Phase II	Phase 2 - office (2-story building on west parcel)	Partially Built	21.7 KSF				15	71	86
Frog Pond-Frog Pond Meadows (Phase 3B, 4A, 4B of 10/18 Study)	Residential	Partially Built, 69 homes built and occupied	74 units				3	2	5
Frog Pond Ridge	Residential	Under construction, no homes occupied	71 units				43	28	71
Frog Pond Crossing	Residential	Under construction, no homes occupied	29 units				19	9	28
Frog Pond Estates	Residential	Approved	17 units				11	7	18
Frog Pond Oaks	Residential	Under construction, no homes occupied	41 units				27	14	41
Frog Pond Vista	Residential	Under construction, no homes occupied	38 units				27	17	44
Frog Pond Overlook	Residential	Approved	12 Units				8	5	13
Frog Pond Terrace	Residential	Approved	19 Units				12	8	20
Canyon Creek III	Residential	Under Construction	5 units (traffic study was for 11)				2	3	5
PW Complex on Boberg	Public	Under Construction	15,800 office, 17,900 warehouse				11	39	50
DAS North Valley Complex	Public/Industria	Under Construction	174,700 sf				5	15	20
Black Creek Group-Garden Acres	Industrial	Under Construction	148,500 sf warehouse	178			69	109	178
Boones Ferry Gas Station/Convenience Store	Commercail	Under Construction	3,460 sf store, 12 gas pumps	240		134	53	53	106
Boones Ferry Construction Storage Yard	Industrial	Under Construction	1.25 acres	5			1	4	5
Frog Pond Primary School	Public	Under Construction	550 students	88			39	48	87
Delta Logistics	Industrial	Approved	56,100 sf wharehouse	33			9	24	33
Building W5 Boeckman and Kinsman	Industrial	Approved	80,000 sf manufacturing	54			17	37	54
Precision Countertops	Industrial	Approved	65800 square feet	43			13	30	43
Town Center Mixed Use	Mixed Use Residential/Commercial	Approved	114 units, 4,000 square feet retail	55			31	24	55

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, 364 homes sold and occupied	451								53	34	87
Central	Residential	Partially Built, 991 homes (102 single family, 319 condo/row homes, 365 apartments) occupied	102	391	510						60	30	90
FOR REFERENCE SAP EAST				537	42								

ERENCE SAP SOUTH (Includes PDP 7 Grande Pointe) 560

Pending Projects for Which Traffic Analysis has been completed

Project	Land Use	Status	Size	Total PM Peak T	Trip Allocation Percentage			Net New (Primary) PM Peak Hour Trips		
					Internal	Pass-By	Diverted	In	Out	Total
Frog Pond Cottage Park Place	Residential	Under review	34 attached units	16				8	7	15
Frog Pond Petras	Residential	Under review	22 attached units	9				5	4	9
Parkway Woods Expansion	Public	under review	80,000 sf manufac	52				16	36	52

Import Counts | Export

Intersection	Total Vehicle Volumes											
	Northbound			Southbound			Eastbound			Westbound		
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Stage II Trips - PM Peak												
Barber Street/Kinsman Road	0	1	0	0	10	1	0	16	0	0	28	0
Barber Street/Boones Ferry Road	23	20	0	0	25	0	0	0	23	0	0	0
Wilsonville Road/Kinsman Road	23	0	48	7	1	2	1	46	6	10	58	0
Wilsonville Rd/Boones Ferry Road	0	4	3	51	6	10	14	85	2	2	58	18
Barber Street/Transit Center Driveway	0	0	0	0	0	0	0	16	0	0	28	0

APPENDIX D: HCM REPORT - EXISTING

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	142	113	155	421	39
Future Vol, veh/h	19	142	113	155	421	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	6	7	11	10	2	3
Mvmt Flow	20	148	118	161	439	41

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	857	460	480	0	-	0
Stage 1	460	-	-	-	-	-
Stage 2	397	-	-	-	-	-
Critical Hdwy	6.46	6.27	4.21	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.363	2.299	-	-	-
Pot Cap-1 Maneuver	323	591	1037	-	-	-
Stage 1	627	-	-	-	-	-
Stage 2	671	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	286	591	1037	-	-	-
Mov Cap-2 Maneuver	286	-	-	-	-	-
Stage 1	556	-	-	-	-	-
Stage 2	671	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15	3.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1037	-	525	-	-
HCM Lane V/C Ratio	0.114	-	0.319	-	-
HCM Control Delay (s)	8.9	-	15	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.4	-	1.4	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	102	1	1	226	3	5	0	5	11	0	5
Future Vol, veh/h	2	102	1	1	226	3	5	0	5	11	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	2	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	2	113	1	1	251	3	6	0	6	12	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	254	0	0	114	0	0	376	374	114	376	373	253
Stage 1	-	-	-	-	-	-	118	118	-	255	255	-
Stage 2	-	-	-	-	-	-	258	256	-	121	118	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1323	-	-	1488	-	-	585	560	944	585	561	791
Stage 1	-	-	-	-	-	-	891	802	-	754	700	-
Stage 2	-	-	-	-	-	-	751	699	-	888	802	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1323	-	-	1488	-	-	580	558	944	580	559	791
Mov Cap-2 Maneuver	-	-	-	-	-	-	580	558	-	580	559	-
Stage 1	-	-	-	-	-	-	889	800	-	752	699	-
Stage 2	-	-	-	-	-	-	745	698	-	881	800	-

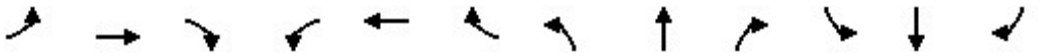
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	10.1	10.8
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	719	1323	-	-	1488	-	-	580	791
HCM Lane V/C Ratio	0.015	0.002	-	-	0.001	-	-	0.021	0.007
HCM Control Delay (s)	10.1	7.7	0	-	7.4	-	-	11.3	9.6
HCM Lane LOS	B	A	A	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1	0

Intersection ID and Name	NB PhasingType	SB PhasingType	EB PhasingType	WB PhasingType	Cycle Leng	Lost Time	Use Overlap Calculator	NBR Ov	SBR Ov	EBR Ov	WBR Ov
1: Barber St & Kinsman Rd	Protected	Protected	Protected	Protected	80	16	No			Yes	
3: Kinsman Rd & Wilsonville Rd	Protected	Protected	Protected	Protected	90	20	No				
4: Wilsonville Rd & Boones Ferry Rd	Split	Split	Protected	Protected	110	16	Yes	Yes			

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		WBL/EBT	EBL/WBT	NBL/SBT	SBL/NBT	V/S E/W	V/S N/S
Adj Flow Rate, veh/	19	96	15	81	141	18	66	116	3	12	208	57	Protected	0.12	0.10	0.19	0.07		
Sat Flow, veh/h	1810	1583	247	1485	1644	210	1781	1814	47	1668	1371	376	Permitted or Split	0.06	0.09	0.15	0.06		
V/S	0.01	0.06	0.06	0.05	0.09	0.09	0.04	0.06	0.06	0.01	0.15	0.15	selected phasing	0.12	0.10	0.19	0.07	0.12	0.19
Adj Flow Rate, veh/	51	496	16	27	530	45	42	43	4	270	29	21	Protected	0.29	0.31	0.05	0.18		
Sat Flow, veh/h	1682	1814	59	1697	1885	1528	1810	1707	159	1739	977	707	Permitted or Split	0.27	0.28	0.16	0.03		
V/S	0.03	0.27	0.27	0.02	0.28	0.03	0.02	0.03	0.03	0.16	0.03	0.03	selected phasing	0.29	0.31	0.05	0.18	0.31	0.18
Adj Flow Rate, veh/	30	767	0	345	499	0	180	101	383	363	155	37	Protected	0.24	0.16	0.21	0.35		
Sat Flow, veh/h	1697	5274	0	3483	3554	1434	1795	1870	1593	3428	1458	348	Permitted or Split	0.15	0.14	0.11	0.24		
V/S	0.02	0.15	0.00	0.10	0.14	0.00	0.10	0.05	0.24	0.11	0.11	0.11	selected phasing	0.24	0.16	0.11	0.24	0.24	0.35

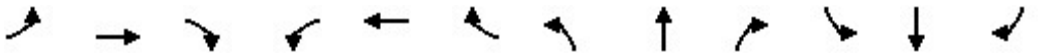
	NBR OV	NB OV V/S	SBR OV	SB OV V/S	EBR OV	EB OV V/S	WBR OV	WB OV V/S	V/S Overlap		Intersection V	HCM 6th Ctrl Dela	HCM 6th LO	Synchro ID
Right Turn Overlap	No	0.00	No	0.00	Yes	0.06	No	0.00		0.27				
Right Turn Approach Phasing	Protected	0.04	Protected	0.04	Protected	0.05	Protected	0.05	EB					
Overlap Approach Phasing	Protected	0.09	Protected	0.09	Protected	0.15	Protected	0.15	Use OV V/S		**0.38**	**14**	**B**	1
Right Turn Overlap	No	0.00	No	0.00	No	0.00	No	0.00		0.00				
Right Turn Approach Phasing	Protected	0.16	Protected	0.16	Protected	0.03	Protected	0.03	No OV					
Overlap Approach Phasing	Protected	0.28	Protected	0.28	Protected	0.03	Protected	0.03	N/A		**0.63**	**18**	**B**	3
Right Turn Overlap	Yes	0.24	No	0.00	No	0.00	No	0.00		0.49				
Right Turn Approach Phasing	Split	0.11	Split	0.24	Protected	0.10	Protected	0.10	NB					
Overlap Approach Phasing	Protected	0.15	Protected	0.15	Split	0.11	Split	0.24	Use OV V/S		**0.58**	**34**	**C**	4



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	89	44	75	131	30	61	108	5	11	193	68
Future Volume (veh/h)	18	89	44	75	131	30	61	108	5	11	193	68
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.96	0.99		0.97	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1885	1870	1559	1900	1900	1870	1870	1307	1752	1826	1900
Adj Flow Rate, veh/h	19	96	15	81	141	18	66	116	3	12	208	57
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	2	23	0	0	2	2	40	10	5	0
Cap, veh/h	279	188	29	299	262	33	623	882	23	702	617	169
Arrive On Green	0.02	0.12	0.12	0.06	0.16	0.16	0.05	0.49	0.49	0.01	0.45	0.45
Sat Flow, veh/h	1810	1583	247	1485	1644	210	1781	1814	47	1668	1371	376
Grp Volume(v), veh/h	19	0	111	81	0	159	66	0	119	12	0	265
Grp Sat Flow(s),veh/h/ln	1810	0	1830	1485	0	1854	1781	0	1861	1668	0	1747
Q Serve(g_s), s	0.5	0.0	2.8	2.3	0.0	3.9	1.0	0.0	1.7	0.2	0.0	4.9
Cycle Q Clear(g_c), s	0.5	0.0	2.8	2.3	0.0	3.9	1.0	0.0	1.7	0.2	0.0	4.9
Prop In Lane	1.00		0.14	1.00		0.11	1.00		0.03	1.00		0.22
Lane Grp Cap(c), veh/h	279	0	217	299	0	295	623	0	904	702	0	786
V/C Ratio(X)	0.07	0.00	0.51	0.27	0.00	0.54	0.11	0.00	0.13	0.02	0.00	0.34
Avail Cap(c_a), veh/h	392	0	815	332	0	826	682	0	904	816	0	849
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.6	0.0	20.4	17.7	0.0	19.1	6.7	0.0	7.0	7.2	0.0	8.8
Incr Delay (d2), s/veh	0.1	0.0	1.9	0.5	0.0	1.5	0.1	0.0	0.3	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	1.2	0.8	0.0	1.6	0.3	0.0	0.6	0.1	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.7	0.0	22.3	18.2	0.0	20.6	6.8	0.0	7.3	7.2	0.0	9.1
LnGrp LOS	B	A	C	B	A	C	A	A	A	A	A	A
Approach Vol, veh/h		130			240			185			277	
Approach Delay, s/veh		21.8			19.8			7.1			9.0	
Approach LOS		C			B			A			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	28.0	6.9	9.9	6.4	26.2	4.9	11.9
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	24.0	4.0	22.0	4.0	24.0	4.0	22.0
Max Q Clear Time (g_c+I1), s	2.2	3.7	4.3	4.8	3.0	6.9	2.5	5.9
Green Ext Time (p_c), s	0.0	0.5	0.0	0.5	0.0	1.4	0.0	0.7

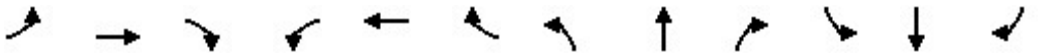
Intersection Summary	
HCM 6th Ctrl Delay	13.7
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	461	16	25	493	130	39	40	91	251	27	99
Future Volume (veh/h)	47	461	16	25	493	130	39	40	91	251	27	99
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	0.98		0.97	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1885	1900	1781	1885	1811	1900	1900	1885	1826	1841	1841
Adj Flow Rate, veh/h	51	496	16	27	530	45	42	43	4	270	29	21
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	9	1	0	8	1	6	0	0	1	5	4	4
Cap, veh/h	267	647	21	272	644	522	305	137	13	499	208	151
Arrive On Green	0.04	0.36	0.36	0.02	0.34	0.34	0.03	0.08	0.08	0.17	0.21	0.21
Sat Flow, veh/h	1682	1814	59	1697	1885	1528	1810	1707	159	1739	977	707
Grp Volume(v), veh/h	51	0	512	27	530	45	42	0	47	270	0	50
Grp Sat Flow(s),veh/h/ln	1682	0	1873	1697	1885	1528	1810	0	1865	1739	0	1684
Q Serve(g_s), s	1.0	0.0	13.1	0.6	13.9	1.1	1.1	0.0	1.3	7.1	0.0	1.3
Cycle Q Clear(g_c), s	1.0	0.0	13.1	0.6	13.9	1.1	1.1	0.0	1.3	7.1	0.0	1.3
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.09	1.00		0.42
Lane Grp Cap(c), veh/h	267	0	668	272	644	522	305	0	150	499	0	359
V/C Ratio(X)	0.19	0.00	0.77	0.10	0.82	0.09	0.14	0.00	0.31	0.54	0.00	0.14
Avail Cap(c_a), veh/h	325	0	1181	356	1189	963	376	0	761	531	0	875
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.6	0.0	15.4	12.4	16.3	12.0	21.6	0.0	23.4	16.4	0.0	17.2
Incr Delay (d2), s/veh	0.3	0.0	1.9	0.2	2.7	0.1	0.2	0.0	1.2	1.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	5.1	0.2	5.6	0.3	0.5	0.0	0.6	2.6	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.9	0.0	17.2	12.6	19.0	12.1	21.8	0.0	24.6	17.4	0.0	17.4
LnGrp LOS	B	A	B	B	B	B	C	A	C	B	A	B
Approach Vol, veh/h		563			602			89			320	
Approach Delay, s/veh		16.8			18.2			23.3			17.4	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	24.2	6.9	16.5	7.1	23.4	14.0	9.3
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	4.0	34.0	4.0	28.0	4.0	34.0	10.0	22.0
Max Q Clear Time (g_c+I1), s	2.6	15.1	3.1	3.3	3.0	15.9	9.1	3.3
Green Ext Time (p_c), s	0.0	2.1	0.0	0.2	0.0	2.4	0.1	0.1

Intersection Summary	
HCM 6th Ctrl Delay	17.8
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	706	81	317	459	165	166	93	352	334	143	46
Future Volume (veh/h)	28	706	81	317	459	165	166	93	352	334	143	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1870	1900	1885	1870	1693	1885	1870	1885	1856	1870	1900
Adj Flow Rate, veh/h	30	767	0	345	499	0	180	101	383	363	155	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	2	0	1	2	14	1	2	1	3	2	0
Cap, veh/h	37	1978		426	1733		375	391	528	466	198	47
Arrive On Green	0.02	0.39	0.00	0.12	0.49	0.00	0.21	0.21	0.21	0.14	0.14	0.14
Sat Flow, veh/h	1697	5274	0	3483	3554	1434	1795	1870	1593	3428	1458	348
Grp Volume(v), veh/h	30	767	0	345	499	0	180	101	383	363	0	192
Grp Sat Flow(s),veh/h/ln	1697	1702	0	1742	1777	1434	1795	1870	1593	1714	0	1806
Q Serve(g_s), s	1.9	11.9	0.0	10.6	9.2	0.0	9.7	5.0	23.0	11.3	0.0	11.3
Cycle Q Clear(g_c), s	1.9	11.9	0.0	10.6	9.2	0.0	9.7	5.0	23.0	11.3	0.0	11.3
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	37	1978		426	1733		375	391	528	466	0	245
V/C Ratio(X)	0.81	0.39		0.81	0.29		0.48	0.26	0.72	0.78	0.00	0.78
Avail Cap(c_a), veh/h	170	1978		697	1733		375	391	528	748	0	394
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.72	0.72	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.6	24.3	0.0	47.0	16.8	0.0	38.2	36.4	32.4	45.9	0.0	46.0
Incr Delay (d2), s/veh	16.5	0.4	0.0	2.3	0.4	0.0	0.6	0.2	4.5	1.8	0.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	4.9	0.0	4.8	3.9	0.0	4.3	2.3	9.5	4.8	0.0	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.1	24.7	0.0	49.3	17.2	0.0	38.8	36.6	36.9	47.7	0.0	49.3
LnGrp LOS	E	C		D	B		D	D	D	D	A	D
Approach Vol, veh/h		797			844			664			555	
Approach Delay, s/veh		26.4			30.3			37.4			48.3	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.5	46.6		18.9	6.4	57.7		27.0				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	22.0	24.0		24.0	11.0	35.0		23.0				
Max Q Clear Time (g_c+I1), s	12.6	13.9		13.3	3.9	11.2		25.0				
Green Ext Time (p_c), s	0.8	4.0		1.3	0.0	3.7		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		34.4
HCM 6th LOS		C

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

APPENDIX E: HCM REPORT – EXISTING + PROJECT

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	160	145	155	421	44
Future Vol, veh/h	21	160	145	155	421	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	6	7	11	10	2	3
Mvmt Flow	22	167	151	161	439	46

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	925	462	485	0	-	0
Stage 1	462	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Critical Hdwy	6.46	6.27	4.21	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.363	2.299	-	-	-
Pot Cap-1 Maneuver	294	589	1033	-	-	-
Stage 1	626	-	-	-	-	-
Stage 2	625	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	251	589	1033	-	-	-
Mov Cap-2 Maneuver	251	-	-	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	625	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.2	4.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1033	-	509	-	-
HCM Lane V/C Ratio	0.146	-	0.37	-	-
HCM Control Delay (s)	9.1	-	16.2	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.5	-	1.7	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	102	1	1	226	39	5	0	5	32	0	10
Future Vol, veh/h	11	102	1	1	226	39	5	0	5	32	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	2	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	12	113	1	1	251	43	6	0	6	36	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	294	0	0	114	0	0	418	434	114	416	413	273
Stage 1	-	-	-	-	-	-	138	138	-	275	275	-
Stage 2	-	-	-	-	-	-	280	296	-	141	138	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1279	-	-	1488	-	-	549	518	944	551	532	771
Stage 1	-	-	-	-	-	-	870	786	-	736	686	-
Stage 2	-	-	-	-	-	-	731	672	-	867	786	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1279	-	-	1488	-	-	537	512	944	543	526	771
Mov Cap-2 Maneuver	-	-	-	-	-	-	537	512	-	543	526	-
Stage 1	-	-	-	-	-	-	861	778	-	729	685	-
Stage 2	-	-	-	-	-	-	720	671	-	853	778	-

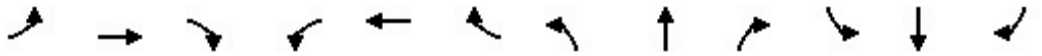
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0	10.3	11.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	685	1279	-	-	1488	-	-	543	771
HCM Lane V/C Ratio	0.016	0.01	-	-	0.001	-	-	0.065	0.014
HCM Control Delay (s)	10.3	7.8	0	-	7.4	-	-	12.1	9.7
HCM Lane LOS	B	A	A	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2	0

Intersection ID and Name	NB PhasingType	SB PhasingType	EB PhasingType	WB PhasingType	Cycle Length	Lost Time	Use Overlap Calculator	NBR Overl	SBR Overla	EBR Overla	WBR Overl
1: Barber St & Kinsman Rd	Protected	Protected	Protected	Protected	80	16	No			No	
3: Kinsman Rd & Wilsonville Rd	Protected	Protected	Protected	Protected	90	20	No				
4: Wilsonville Rd & Boones Ferry Rd	Split	Split	Protected	Protected	110	16	Yes	Yes			

1	3	4	5	6	7	8	9	10	11	12	13	14		Critical Flow Calculator					
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		WBL/EBT	EBL/WBT	NBL/SBT	SBL/NBT	V/S E/W	V/S N/S
Adj Flow Rate, veh/l	19	98	16	84	142	19	66	116	8	14	208	57	Protected	0.12	0.10	0.19	0.08		
Sat Flow, veh/h	1810	1571	257	1485	1634	219	1781	1727	119	1668	1371	376	Permitted or Split	0.06	0.09	0.15	0.07		
V/S	0.01	0.06	0.06	0.06	0.09	0.09	0.04	0.07	0.07	0.01	0.15	0.15	selected phasing	0.12	0.10	0.19	0.08	0.12	0.19
Adj Flow Rate, veh/l	56	496	16	27	530	48	42	43	4	270	29	21	Protected	0.29	0.31	0.05	0.18		
Sat Flow, veh/h	1682	1814	59	1697	1885	1528	1810	1707	159	1739	977	707	Permitted or Split	0.27	0.28	0.16	0.03		
V/S	0.03	0.27	0.27	0.02	0.28	0.03	0.02	0.03	0.03	0.16	0.03	0.03	selected phasing	0.29	0.31	0.05	0.18	0.31	0.18
Adj Flow Rate, veh/l	30	767	0	345	499	0	180	107	383	380	159	38	Protected	0.24	0.16	0.21	0.35		
Sat Flow, veh/h	1697	5274	0	3483	3554	1434	1795	1870	1593	3428	1458	348	Permitted or Split	0.15	0.14	0.11	0.24		
V/S	0.02	0.15	0.00	0.10	0.14	0.00	0.10	0.06	0.24	0.11	0.11	0.11	selected phasing	0.24	0.16	0.11	0.24	0.24	0.35

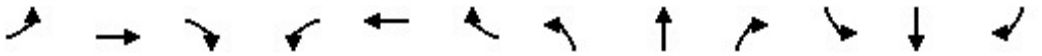
Overlap Critical Flow Calculator													
	NBR OV	NB OV V/S	SBR OV	SB OV V/S	EBR OV	EB OV V/S	WBR OV	WB OV V/S	V/S Overlap	Intersection V/C	HCM 6th Ctrl Delay	HCM 6th LOS	Synchro ID
Right Turn Overlap	No	0.00	No	0.00	No	0.00	No	0.00	0.00				
Right Turn Approach Phasing	Protected	0.04	Protected	0.04	Protected	0.06	Protected	0.06	No OV				
Overlap Approach Phasing	Protected	0.09	Protected	0.09	Protected	0.15	Protected	0.15	N/A	**0.38**	**14**	**B**	1
Right Turn Overlap	No	0.00	No	0.00	No	0.00	No	0.00	0.00				
Right Turn Approach Phasing	Protected	0.16	Protected	0.16	Protected	0.03	Protected	0.03	No OV				
Overlap Approach Phasing	Protected	0.28	Protected	0.28	Protected	0.03	Protected	0.03	N/A	**0.64**	**18**	**B**	3
Right Turn Overlap	Yes	0.24	No	0.00	No	0.00	No	0.00	0.50				
Right Turn Approach Phasing	Split	0.11	Split	0.24	Protected	0.10	Protected	0.10	NB				
Overlap Approach Phasing	Protected	0.15	Protected	0.15	Split	0.11	Split	0.24	Use OV V/S	**0.58**	**35**	**C**	4



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	107	44	78	160	31	61	109	10	13	203	69
Future Volume (veh/h)	18	107	44	78	160	31	61	109	10	13	203	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.99		0.97	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1885	1870	1559	1900	1900	1870	1870	1307	1752	1826	1900
Adj Flow Rate, veh/h	19	115	16	84	172	19	66	117	8	14	218	58
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	2	23	0	0	2	2	40	10	5	0
Cap, veh/h	270	210	29	299	289	32	602	824	56	686	612	163
Arrive On Green	0.02	0.13	0.13	0.06	0.17	0.17	0.05	0.48	0.48	0.01	0.44	0.44
Sat Flow, veh/h	1810	1611	224	1485	1675	185	1781	1728	118	1668	1381	367
Grp Volume(v), veh/h	19	0	131	84	0	191	66	0	125	14	0	276
Grp Sat Flow(s),veh/h/ln	1810	0	1835	1485	0	1860	1781	0	1846	1668	0	1749
Q Serve(g_s), s	0.5	0.0	3.4	2.4	0.0	4.8	1.0	0.0	1.9	0.2	0.0	5.3
Cycle Q Clear(g_c), s	0.5	0.0	3.4	2.4	0.0	4.8	1.0	0.0	1.9	0.2	0.0	5.3
Prop In Lane	1.00		0.12	1.00		0.10	1.00		0.06	1.00		0.21
Lane Grp Cap(c), veh/h	270	0	239	299	0	321	602	0	880	686	0	775
V/C Ratio(X)	0.07	0.00	0.55	0.28	0.00	0.60	0.11	0.00	0.14	0.02	0.00	0.36
Avail Cap(c_a), veh/h	380	0	802	327	0	813	658	0	880	795	0	834
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.5	0.0	20.5	17.5	0.0	19.2	7.1	0.0	7.4	7.5	0.0	9.3
Incr Delay (d2), s/veh	0.1	0.0	2.0	0.5	0.0	1.8	0.1	0.0	0.3	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	1.4	0.8	0.0	2.0	0.3	0.0	0.7	0.1	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.6	0.0	22.5	18.0	0.0	21.0	7.1	0.0	7.7	7.5	0.0	9.5
LnGrp LOS	B	A	C	B	A	C	A	A	A	A	A	A
Approach Vol, veh/h		150			275			191			290	
Approach Delay, s/veh		22.0			20.1			7.5			9.4	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	28.0	7.1	10.5	6.4	26.3	4.9	12.7
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	24.0	4.0	22.0	4.0	24.0	4.0	22.0
Max Q Clear Time (g_c+I1), s	2.2	3.9	4.4	5.4	3.0	7.3	2.5	6.8
Green Ext Time (p_c), s	0.0	0.6	0.0	0.6	0.0	1.5	0.0	0.9

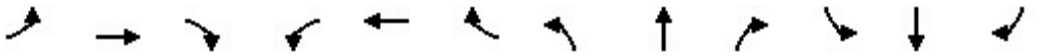
Intersection Summary	
HCM 6th Ctrl Delay	14.3
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	507	22	35	551	130	62	40	139	258	28	104
Future Volume (veh/h)	53	507	22	35	551	130	62	40	139	258	28	104
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	0.99		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1885	1900	1781	1885	1811	1900	1900	1885	1826	1841	1841
Adj Flow Rate, veh/h	57	545	23	38	592	48	67	43	55	277	30	23
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	9	1	0	8	1	6	0	0	1	5	4	4
Cap, veh/h	241	671	28	251	687	557	341	78	100	465	213	163
Arrive On Green	0.04	0.37	0.37	0.03	0.36	0.36	0.04	0.11	0.11	0.16	0.22	0.22
Sat Flow, veh/h	1682	1793	76	1697	1885	1528	1810	745	953	1739	951	729
Grp Volume(v), veh/h	57	0	568	38	592	48	67	0	98	277	0	53
Grp Sat Flow(s),veh/h/ln	1682	0	1869	1697	1885	1528	1810	0	1698	1739	0	1680
Q Serve(g_s), s	1.3	0.0	16.7	0.8	17.8	1.3	2.0	0.0	3.4	8.1	0.0	1.5
Cycle Q Clear(g_c), s	1.3	0.0	16.7	0.8	17.8	1.3	2.0	0.0	3.4	8.1	0.0	1.5
Prop In Lane	1.00		0.04	1.00		1.00	1.00		0.56	1.00		0.43
Lane Grp Cap(c), veh/h	241	0	699	251	687	557	341	0	179	465	0	376
V/C Ratio(X)	0.24	0.00	0.81	0.15	0.86	0.09	0.20	0.00	0.55	0.60	0.00	0.14
Avail Cap(c_a), veh/h	282	0	1037	309	1046	848	378	0	610	465	0	768
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.0	0.0	17.2	13.7	18.0	12.8	23.0	0.0	26.0	18.1	0.0	19.0
Incr Delay (d2), s/veh	0.5	0.0	3.1	0.3	4.8	0.1	0.3	0.0	2.6	2.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	7.0	0.3	7.8	0.4	0.8	0.0	1.4	3.2	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.5	0.0	20.4	14.0	22.9	12.8	23.3	0.0	28.6	20.2	0.0	19.2
LnGrp LOS	B	A	C	B	C	B	C	A	C	C	A	B
Approach Vol, veh/h		625			678			165			330	
Approach Delay, s/veh		19.8			21.7			26.5			20.0	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	27.9	7.7	18.7	7.5	27.3	15.0	11.5
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	4.0	34.0	4.0	28.0	4.0	34.0	10.0	22.0
Max Q Clear Time (g_c+I1), s	2.8	18.7	4.0	3.5	3.3	19.8	10.1	5.4
Green Ext Time (p_c), s	0.0	2.3	0.0	0.2	0.0	2.5	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	21.2
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	791	83	319	517	210	166	102	355	401	152	56
Future Volume (veh/h)	42	791	83	319	517	210	166	102	355	401	152	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1870	1900	1885	1870	1693	1885	1870	1885	1856	1870	1900
Adj Flow Rate, veh/h	46	860	0	347	562	0	180	111	386	436	165	48
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	2	0	1	2	14	1	2	1	3	2	0
Cap, veh/h	58	1870		428	1617		375	391	529	536	217	63
Arrive On Green	0.03	0.37	0.00	0.12	0.45	0.00	0.21	0.21	0.21	0.16	0.16	0.16
Sat Flow, veh/h	1697	5274	0	3483	3554	1434	1795	1870	1593	3428	1391	405
Grp Volume(v), veh/h	46	860	0	347	562	0	180	111	386	436	0	213
Grp Sat Flow(s),veh/h/ln	1697	1702	0	1742	1777	1434	1795	1870	1593	1714	0	1796
Q Serve(g_s), s	3.0	14.1	0.0	10.7	11.3	0.0	9.7	5.5	23.0	13.5	0.0	12.5
Cycle Q Clear(g_c), s	3.0	14.1	0.0	10.7	11.3	0.0	9.7	5.5	23.0	13.5	0.0	12.5
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.23
Lane Grp Cap(c), veh/h	58	1870		428	1617		375	391	529	536	0	281
V/C Ratio(X)	0.79	0.46		0.81	0.35		0.48	0.28	0.73	0.81	0.00	0.76
Avail Cap(c_a), veh/h	170	1870		697	1617		375	391	529	748	0	392
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.60	0.60	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.7	26.6	0.0	47.0	19.4	0.0	38.2	36.6	32.4	44.9	0.0	44.4
Incr Delay (d2), s/veh	8.6	0.5	0.0	2.3	0.6	0.0	0.6	0.2	4.7	3.9	0.0	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	5.8	0.0	4.8	4.8	0.0	4.3	2.5	9.6	6.0	0.0	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.3	27.1	0.0	49.3	20.0	0.0	38.8	36.8	37.1	48.7	0.0	48.5
LnGrp LOS	E	C		D	C		D	D	D	D	A	D
Approach Vol, veh/h		906			909			677			649	
Approach Delay, s/veh		28.8			31.2			37.5			48.6	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.5	44.3		21.2	7.8	54.0		27.0				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	22.0	24.0		24.0	11.0	35.0		23.0				
Max Q Clear Time (g_c+I1), s	12.7	16.1		15.5	5.0	13.3		25.0				
Green Ext Time (p_c), s	0.8	3.7		1.5	0.0	4.2		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		35.5	
HCM 6th LOS		D	

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

APPENDIX F: HCM REPORT – EXISTING + STAGE II

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	165	136	175	446	39
Future Vol, veh/h	19	165	136	175	446	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	6	7	11	10	2	3
Mvmt Flow	20	172	142	182	465	41

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	952	486	506	0	-	0
Stage 1	486	-	-	-	-	-
Stage 2	466	-	-	-	-	-
Critical Hdwy	6.46	6.27	4.21	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.363	2.299	-	-	-
Pot Cap-1 Maneuver	283	571	1014	-	-	-
Stage 1	610	-	-	-	-	-
Stage 2	623	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	243	571	1014	-	-	-
Mov Cap-2 Maneuver	243	-	-	-	-	-
Stage 1	525	-	-	-	-	-
Stage 2	623	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.6	4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1014	-	501	-	-
HCM Lane V/C Ratio	0.14	-	0.383	-	-
HCM Control Delay (s)	9.1	-	16.6	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.5	-	1.8	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	118	1	1	254	3	5	0	5	11	0	5
Future Vol, veh/h	2	118	1	1	254	3	5	0	5	11	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	2	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	2	131	1	1	282	3	6	0	6	12	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	285	0	0	132	0	0	425	423	132	425	422	284
Stage 1	-	-	-	-	-	-	136	136	-	286	286	-
Stage 2	-	-	-	-	-	-	289	287	-	139	136	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1289	-	-	1466	-	-	543	526	923	543	526	760
Stage 1	-	-	-	-	-	-	872	788	-	726	679	-
Stage 2	-	-	-	-	-	-	723	678	-	869	788	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1289	-	-	1466	-	-	538	524	923	539	524	760
Mov Cap-2 Maneuver	-	-	-	-	-	-	538	524	-	539	524	-
Stage 1	-	-	-	-	-	-	870	786	-	725	678	-
Stage 2	-	-	-	-	-	-	717	677	-	862	786	-

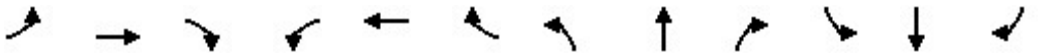
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	10.4	11.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	680	1289	-	-	1466	-	-	539	760
HCM Lane V/C Ratio	0.016	0.002	-	-	0.001	-	-	0.023	0.007
HCM Control Delay (s)	10.4	7.8	0	-	7.5	-	-	11.8	9.8
HCM Lane LOS	B	A	A	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1	0

Intersection ID and Name	NB PhasingType	SB PhasingType	EB PhasingType	WB PhasingType	Cycle Leng	Lost Time	Use Overlap Calculator	NBR Ove	SBR Ove	EBR Ove	WBR Ov
1: Barber St & Kinsman Rd	Protected	Protected	Protected	Protected	80	16	No			Yes	
3: Kinsman Rd & Wilsonville Rd	Protected	Protected	Protected	Protected	90	20	No				
4: Wilsonville Rd & Boones Ferry Rd	Split	Split	Protected	Protected	110	16	Yes	Yes			

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		WBL/EBT	EBL/WBT	NBL/SBT	SBL/NBT	V/S E/W	V/S N/S
Adj Flow Rate, veh/h	19	113	20	81	171	20	66	117	3	12	218	58	Protected	0.13	0.11	0.20	0.07		
Sat Flow, veh/h	1810	1550	274	1485	1663	195	1781	1814	47	1668	1381	367	Permitted or Split	0.07	0.10	0.16	0.06		
V/S	0.01	0.07	0.07	0.05	0.10	0.10	0.04	0.06	0.06	0.01	0.16	0.16	selected phasing	0.13	0.11	0.20	0.07	0.13	0.20
Adj Flow Rate, veh/h	52	545	22	38	592	45	67	43	15	277	30	24	Protected	0.33	0.34	0.07	0.19		
Sat Flow, veh/h	1682	1797	73	1697	1885	1529	1810	1333	465	1739	931	745	Permitted or Split	0.30	0.31	0.16	0.04		
V/S	0.03	0.30	0.30	0.02	0.31	0.03	0.04	0.03	0.03	0.16	0.03	0.03	selected phasing	0.33	0.34	0.07	0.19	0.34	0.19
Adj Flow Rate, veh/h	46	860	0	347	562	0	180	105	386	418	162	47	Protected	0.26	0.19	0.22	0.36		
Sat Flow, veh/h	1697	5274	0	3483	3554	1434	1795	1870	1593	3428	1392	404	Permitted or Split	0.16	0.16	0.12	0.24		
V/S	0.03	0.16	0.00	0.10	0.16	0.00	0.10	0.06	0.24	0.12	0.12	0.12	selected phasing	0.26	0.19	0.12	0.24	0.26	0.36

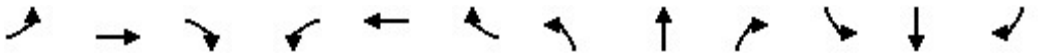
	NBR OV	NB OV V/S	SBR OV	SB OV V/S	EBR OV	EB OV V/S	WBR OV	WB OV V/S	V/S Overlap		Intersection V/C	HCM 6th Ctrl Delay	HCM 6th LOS	Synchro ID
Right Turn Overlap	No	0.00	No	0.00	Yes	0.07	No	0.00		0.29				
Right Turn Approach Phasing	Protected	0.04	Protected	0.04	Protected	0.05	Protected	0.05	EB					
Overlap Approach Phasing	Protected	0.10	Protected	0.10	Protected	0.16	Protected	0.16	Use OV V/S		**0.40**	**14**	**B**	1
Right Turn Overlap	No	0.00	No	0.00	No	0.00	No	0.00		0.00				
Right Turn Approach Phasing	Protected	0.16	Protected	0.16	Protected	0.03	Protected	0.03	No OV					
Overlap Approach Phasing	Protected	0.31	Protected	0.31	Protected	0.03	Protected	0.03	N/A		**0.69**	**20**	**B**	3
Right Turn Overlap	Yes	0.24	No	0.00	No	0.00	No	0.00		0.53				
Right Turn Approach Phasing	Split	0.12	Split	0.24	Protected	0.10	Protected	0.10	NB					
Overlap Approach Phasing	Protected	0.16	Protected	0.16	Split	0.12	Split	0.24	Use OV V/S		**0.62**	**35**	**D**	4



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	105	44	75	159	30	61	109	5	11	203	69
Future Volume (veh/h)	18	105	44	75	159	30	61	109	5	11	203	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.99		0.97	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1885	1870	1559	1900	1900	1870	1870	1307	1752	1826	1900
Adj Flow Rate, veh/h	19	113	20	81	171	20	66	117	3	12	218	58
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	2	23	0	0	2	2	40	10	5	0
Cap, veh/h	270	204	36	297	286	33	602	868	22	690	611	163
Arrive On Green	0.02	0.13	0.13	0.06	0.17	0.17	0.05	0.48	0.48	0.01	0.44	0.44
Sat Flow, veh/h	1810	1550	274	1485	1663	195	1781	1814	47	1668	1381	367
Grp Volume(v), veh/h	19	0	133	81	0	191	66	0	120	12	0	276
Grp Sat Flow(s),veh/h/ln	1810	0	1824	1485	0	1858	1781	0	1861	1668	0	1749
Q Serve(g_s), s	0.5	0.0	3.4	2.3	0.0	4.8	1.0	0.0	1.8	0.2	0.0	5.2
Cycle Q Clear(g_c), s	0.5	0.0	3.4	2.3	0.0	4.8	1.0	0.0	1.8	0.2	0.0	5.2
Prop In Lane	1.00		0.15	1.00		0.10	1.00		0.03	1.00		0.21
Lane Grp Cap(c), veh/h	270	0	241	297	0	319	602	0	890	690	0	774
V/C Ratio(X)	0.07	0.00	0.55	0.27	0.00	0.60	0.11	0.00	0.13	0.02	0.00	0.36
Avail Cap(c_a), veh/h	380	0	800	328	0	815	658	0	890	802	0	837
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.4	0.0	20.4	17.5	0.0	19.2	7.0	0.0	7.3	7.5	0.0	9.3
Incr Delay (d2), s/veh	0.1	0.0	2.0	0.5	0.0	1.8	0.1	0.0	0.3	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	1.5	0.8	0.0	2.0	0.3	0.0	0.6	0.1	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.5	0.0	22.4	18.0	0.0	21.0	7.1	0.0	7.6	7.5	0.0	9.5
LnGrp LOS	B	A	C	B	A	C	A	A	A	A	A	A
Approach Vol, veh/h		152			272			186			288	
Approach Delay, s/veh		21.9			20.1			7.4			9.4	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	28.0	6.9	10.6	6.4	26.2	4.9	12.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	24.0	4.0	22.0	4.0	24.0	4.0	22.0
Max Q Clear Time (g_c+I1), s	2.2	3.8	4.3	5.4	3.0	7.2	2.5	6.8
Green Ext Time (p_c), s	0.0	0.5	0.0	0.6	0.0	1.5	0.0	0.9

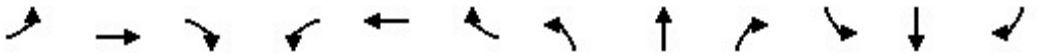
Intersection Summary	
HCM 6th Ctrl Delay	14.4
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	507	22	35	551	130	62	40	139	258	28	101
Future Volume (veh/h)	48	507	22	35	551	130	62	40	139	258	28	101
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	0.98		0.97	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1885	1900	1781	1885	1811	1900	1900	1885	1826	1841	1841
Adj Flow Rate, veh/h	52	545	22	38	592	45	67	43	15	277	30	24
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	9	1	0	8	1	6	0	0	1	5	4	4
Cap, veh/h	249	675	27	261	694	563	314	107	37	481	189	151
Arrive On Green	0.04	0.38	0.38	0.03	0.37	0.37	0.05	0.08	0.08	0.17	0.20	0.20
Sat Flow, veh/h	1682	1797	73	1697	1885	1529	1810	1333	465	1739	931	745
Grp Volume(v), veh/h	52	0	567	38	592	45	67	0	58	277	0	54
Grp Sat Flow(s),veh/h/ln	1682	0	1870	1697	1885	1529	1810	0	1799	1739	0	1675
Q Serve(g_s), s	1.1	0.0	15.8	0.8	16.8	1.1	2.0	0.0	1.8	7.9	0.0	1.5
Cycle Q Clear(g_c), s	1.1	0.0	15.8	0.8	16.8	1.1	2.0	0.0	1.8	7.9	0.0	1.5
Prop In Lane	1.00		0.04	1.00		1.00	1.00		0.26	1.00		0.44
Lane Grp Cap(c), veh/h	249	0	703	261	694	563	314	0	144	481	0	340
V/C Ratio(X)	0.21	0.00	0.81	0.15	0.85	0.08	0.21	0.00	0.40	0.58	0.00	0.16
Avail Cap(c_a), veh/h	299	0	1094	324	1103	894	356	0	681	488	0	807
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.1	0.0	16.3	12.8	16.9	12.0	23.1	0.0	25.4	17.9	0.0	19.1
Incr Delay (d2), s/veh	0.4	0.0	2.5	0.3	3.9	0.1	0.3	0.0	1.8	1.6	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	6.3	0.3	7.1	0.3	0.8	0.0	0.8	3.1	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.6	0.0	18.8	13.1	20.8	12.0	23.4	0.0	27.2	19.6	0.0	19.3
LnGrp LOS	B	A	B	B	C	B	C	A	C	B	A	B
Approach Vol, veh/h		619			675			125			331	
Approach Delay, s/veh		18.4			19.8			25.2			19.5	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.8	26.8	7.6	16.8	7.3	26.4	14.8	9.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	4.0	34.0	4.0	28.0	4.0	34.0	10.0	22.0
Max Q Clear Time (g_c+I1), s	2.8	17.8	4.0	3.5	3.1	18.8	9.9	3.8
Green Ext Time (p_c), s	0.0	2.3	0.0	0.2	0.0	2.6	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	19.6
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	791	83	319	517	183	166	97	355	385	149	56
Future Volume (veh/h)	42	791	83	319	517	183	166	97	355	385	149	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1870	1900	1885	1870	1693	1885	1870	1885	1856	1870	1900
Adj Flow Rate, veh/h	46	860	0	347	562	0	180	105	386	418	162	47
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	2	0	1	2	14	1	2	1	3	2	0
Cap, veh/h	58	1896		428	1635		375	391	529	519	211	61
Arrive On Green	0.03	0.37	0.00	0.12	0.46	0.00	0.21	0.21	0.21	0.15	0.15	0.15
Sat Flow, veh/h	1697	5274	0	3483	3554	1434	1795	1870	1593	3428	1392	404
Grp Volume(v), veh/h	46	860	0	347	562	0	180	105	386	418	0	209
Grp Sat Flow(s),veh/h/ln	1697	1702	0	1742	1777	1434	1795	1870	1593	1714	0	1796
Q Serve(g_s), s	3.0	14.0	0.0	10.7	11.2	0.0	9.7	5.2	23.0	13.0	0.0	12.3
Cycle Q Clear(g_c), s	3.0	14.0	0.0	10.7	11.2	0.0	9.7	5.2	23.0	13.0	0.0	12.3
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	58	1896		428	1635		375	391	529	519	0	272
V/C Ratio(X)	0.79	0.45		0.81	0.34		0.48	0.27	0.73	0.81	0.00	0.77
Avail Cap(c_a), veh/h	170	1896		697	1635		375	391	529	748	0	392
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.60	0.60	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.7	26.1	0.0	47.0	19.1	0.0	38.2	36.5	32.4	45.1	0.0	44.8
Incr Delay (d2), s/veh	8.6	0.5	0.0	2.3	0.6	0.0	0.6	0.2	4.7	3.3	0.0	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	5.8	0.0	4.8	4.8	0.0	4.3	2.4	9.6	5.7	0.0	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.3	26.6	0.0	49.3	19.6	0.0	38.8	36.7	37.1	48.4	0.0	48.9
LnGrp LOS	E	C		D	B		D	D	D	D	A	D
Approach Vol, veh/h		906			909			671			627	
Approach Delay, s/veh		28.4			31.0			37.5			48.5	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.5	44.8		20.6	7.8	54.6		27.0				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	22.0	24.0		24.0	11.0	35.0		23.0				
Max Q Clear Time (g_c+I1), s	12.7	16.0		15.0	5.0	13.2		25.0				
Green Ext Time (p_c), s	0.8	3.8		1.4	0.0	4.2		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		35.2
HCM 6th LOS		D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

APPENDIX G: HCM REPORT – EXISTING + PROJECT + STAGE II

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	183	168	175	446	44
Future Vol, veh/h	21	183	168	175	446	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	6	7	11	10	2	3
Mvmt Flow	22	191	175	182	465	46

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1020	488	511	0	-	0
Stage 1	488	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Critical Hdwy	6.46	6.27	4.21	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.363	2.299	-	-	-
Pot Cap-1 Maneuver	258	570	1010	-	-	-
Stage 1	609	-	-	-	-	-
Stage 2	581	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	213	570	1010	-	-	-
Mov Cap-2 Maneuver	213	-	-	-	-	-
Stage 1	504	-	-	-	-	-
Stage 2	581	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18	4.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1010	-	486	-	-
HCM Lane V/C Ratio	0.173	-	0.437	-	-
HCM Control Delay (s)	9.3	-	18	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.6	-	2.2	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	118	1	1	254	39	5	0	5	32	0	10
Future Vol, veh/h	11	118	1	1	254	39	5	0	5	32	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	2	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	12	131	1	1	282	43	6	0	6	36	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	325	0	0	132	0	0	467	483	132	465	462	304
Stage 1	-	-	-	-	-	-	156	156	-	306	306	-
Stage 2	-	-	-	-	-	-	311	327	-	159	156	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1246	-	-	1466	-	-	509	486	923	511	500	740
Stage 1	-	-	-	-	-	-	851	772	-	708	665	-
Stage 2	-	-	-	-	-	-	704	651	-	848	772	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1246	-	-	1466	-	-	497	481	923	504	495	740
Mov Cap-2 Maneuver	-	-	-	-	-	-	497	481	-	504	495	-
Stage 1	-	-	-	-	-	-	842	764	-	701	664	-
Stage 2	-	-	-	-	-	-	693	650	-	834	764	-

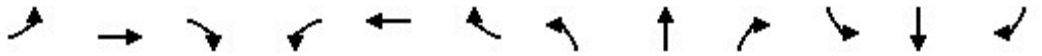
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	10.7	12
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	646	1246	-	-	1466	-	-	504	740
HCM Lane V/C Ratio	0.017	0.01	-	-	0.001	-	-	0.071	0.015
HCM Control Delay (s)	10.7	7.9	0	-	7.5	-	-	12.7	9.9
HCM Lane LOS	B	A	A	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2	0

	use dropdown	use dropdown	use dropdown	use dropdown			use dropdown	use dropd	use dropd	use dropd	use dropd
Intersection ID and Name	**NB PhasingType**	**SB PhasingType**	**EB PhasingType**	**WB PhasingType**	**Cycle Length**	**Lost Time**	**Use Overlap Calculator**	**NBR Overla**	**SBR Overla**	**EBR Overla**	**WBR Overl**
1: Barber St & Kinsman Rd	Protected	Protected	Protected	Protected	80	16	No			No	
3: Kinsman Rd & Wilsonville Rd	Protected	Protected	Protected	Protected	90	20	No				
4: Wilsonville Rd & Boones Ferry Rd	Split	Split	Protected	Protected	110	16	Yes	Yes			

1	3	4	5	6	7	8	9	10	11	12	13	14		Critical Flow Calculator					
	EBL	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**		**WBL/EBT**	**EBL/WBT**	**NBL/SBT**	**SBL/NBT**	**V/S E/W**	**V/S N/S**
Adj Flow Rate, veh/l	19	115	16	84	172	19	66	117	8	14	218	58	Protected	0.13	0.11	0.20	0.08		
Sat Flow, veh/h	1810	1611	224	1485	1675	185	1781	1728	118	1668	1381	367	Permitted or Split	0.07	0.10	0.16	0.07		
V/S	0.01	0.07	0.07	0.06	0.10	0.10	0.04	0.07	0.07	0.01	0.16	0.16	selected phasing	0.13	0.11	0.20	0.08	0.13	0.20
Adj Flow Rate, veh/l	57	545	23	38	592	48	67	43	55	277	30	23	Protected	0.33	0.35	0.07	0.22		
Sat Flow, veh/h	1682	1793	76	1697	1885	1528	1810	745	953	1739	951	729	Permitted or Split	0.30	0.31	0.16	0.06		
V/S	0.03	0.30	0.30	0.02	0.31	0.03	0.04	0.06	0.06	0.16	0.03	0.03	selected phasing	0.33	0.35	0.07	0.22	0.35	0.22
Adj Flow Rate, veh/l	46	860	0	347	562	0	180	111	386	436	165	48	Protected	0.26	0.19	0.22	0.37		
Sat Flow, veh/h	1697	5274	0	3483	3554	1434	1795	1870	1593	3428	1391	405	Permitted or Split	0.16	0.16	0.13	0.24		
V/S	0.03	0.16	0.00	0.10	0.16	0.00	0.10	0.06	0.24	0.13	0.12	0.12	selected phasing	0.26	0.19	0.13	0.24	0.26	0.37

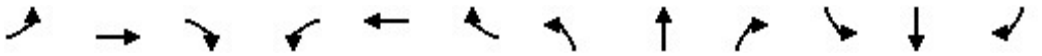
Overlap Critical Flow Calculator													
	NBR OV	**NB OV V/S**	**SBR OV**	**SB OV V/S**	**EBR OV**	**EB OV V/S**	**WBR OV**	**WB OV V/S**	**V/S Overlap**		**Intersection V/C**	**HCM 6th Ctrl Delay**	**HCM 6th LOS**	**Synchro ID**
Right Turn Overlap	No	0.00	No	0.00	No	0.00	No	0.00		0.00				
Right Turn Approach Phasing	Protected	0.04	Protected	0.04	Protected	0.06	Protected	0.06	No OV					
Overlap Approach Phasing	Protected	0.10	Protected	0.10	Protected	0.16	Protected	0.16	N/A		**0.40**	**14**	**B**	1
Right Turn Overlap	No	0.00	No	0.00	No	0.00	No	0.00		0.00				
Right Turn Approach Phasing	Protected	0.16	Protected	0.16	Protected	0.03	Protected	0.03	No OV					
Overlap Approach Phasing	Protected	0.31	Protected	0.31	Protected	0.06	Protected	0.06	N/A		**0.73**	**21**	**C**	3
Right Turn Overlap	Yes	0.24	No	0.00	No	0.00	No	0.00		0.53				
Right Turn Approach Phasing	Split	0.13	Split	0.24	Protected	0.10	Protected	0.10	NB					
Overlap Approach Phasing	Protected	0.16	Protected	0.16	Split	0.13	Split	0.24	Use OV V/S		**0.62**	**36**	**D**	4



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	107	44	78	160	31	61	109	10	13	203	69
Future Volume (veh/h)	18	107	44	78	160	31	61	109	10	13	203	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.99		0.97	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1885	1870	1559	1900	1900	1870	1870	1307	1752	1826	1900
Adj Flow Rate, veh/h	19	115	16	84	172	19	66	117	8	14	218	58
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	2	23	0	0	2	2	40	10	5	0
Cap, veh/h	270	210	29	299	289	32	602	824	56	686	612	163
Arrive On Green	0.02	0.13	0.13	0.06	0.17	0.17	0.05	0.48	0.48	0.01	0.44	0.44
Sat Flow, veh/h	1810	1611	224	1485	1675	185	1781	1728	118	1668	1381	367
Grp Volume(v), veh/h	19	0	131	84	0	191	66	0	125	14	0	276
Grp Sat Flow(s),veh/h/ln	1810	0	1835	1485	0	1860	1781	0	1846	1668	0	1749
Q Serve(g_s), s	0.5	0.0	3.4	2.4	0.0	4.8	1.0	0.0	1.9	0.2	0.0	5.3
Cycle Q Clear(g_c), s	0.5	0.0	3.4	2.4	0.0	4.8	1.0	0.0	1.9	0.2	0.0	5.3
Prop In Lane	1.00		0.12	1.00		0.10	1.00		0.06	1.00		0.21
Lane Grp Cap(c), veh/h	270	0	239	299	0	321	602	0	880	686	0	775
V/C Ratio(X)	0.07	0.00	0.55	0.28	0.00	0.60	0.11	0.00	0.14	0.02	0.00	0.36
Avail Cap(c_a), veh/h	380	0	802	327	0	813	658	0	880	795	0	834
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.5	0.0	20.5	17.5	0.0	19.2	7.1	0.0	7.4	7.5	0.0	9.3
Incr Delay (d2), s/veh	0.1	0.0	2.0	0.5	0.0	1.8	0.1	0.0	0.3	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	1.4	0.8	0.0	2.0	0.3	0.0	0.7	0.1	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.6	0.0	22.5	18.0	0.0	21.0	7.1	0.0	7.7	7.5	0.0	9.5
LnGrp LOS	B	A	C	B	A	C	A	A	A	A	A	A
Approach Vol, veh/h		150			275			191			290	
Approach Delay, s/veh		22.0			20.1			7.5			9.4	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	28.0	7.1	10.5	6.4	26.3	4.9	12.7
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	24.0	4.0	22.0	4.0	24.0	4.0	22.0
Max Q Clear Time (g_c+I1), s	2.2	3.9	4.4	5.4	3.0	7.3	2.5	6.8
Green Ext Time (p_c), s	0.0	0.6	0.0	0.6	0.0	1.5	0.0	0.9

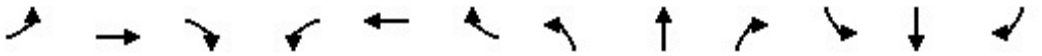
Intersection Summary	
HCM 6th Ctrl Delay	14.3
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	507	22	35	551	130	62	40	139	258	28	104
Future Volume (veh/h)	53	507	22	35	551	130	62	40	139	258	28	104
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	0.99		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1885	1900	1781	1885	1811	1900	1900	1885	1826	1841	1841
Adj Flow Rate, veh/h	57	545	23	38	592	48	67	43	55	277	30	23
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	9	1	0	8	1	6	0	0	1	5	4	4
Cap, veh/h	241	671	28	251	687	557	341	78	100	465	213	163
Arrive On Green	0.04	0.37	0.37	0.03	0.36	0.36	0.04	0.11	0.11	0.16	0.22	0.22
Sat Flow, veh/h	1682	1793	76	1697	1885	1528	1810	745	953	1739	951	729
Grp Volume(v), veh/h	57	0	568	38	592	48	67	0	98	277	0	53
Grp Sat Flow(s),veh/h/ln	1682	0	1869	1697	1885	1528	1810	0	1698	1739	0	1680
Q Serve(g_s), s	1.3	0.0	16.7	0.8	17.8	1.3	2.0	0.0	3.4	8.1	0.0	1.5
Cycle Q Clear(g_c), s	1.3	0.0	16.7	0.8	17.8	1.3	2.0	0.0	3.4	8.1	0.0	1.5
Prop In Lane	1.00		0.04	1.00		1.00	1.00		0.56	1.00		0.43
Lane Grp Cap(c), veh/h	241	0	699	251	687	557	341	0	179	465	0	376
V/C Ratio(X)	0.24	0.00	0.81	0.15	0.86	0.09	0.20	0.00	0.55	0.60	0.00	0.14
Avail Cap(c_a), veh/h	282	0	1037	309	1046	848	378	0	610	465	0	768
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.0	0.0	17.2	13.7	18.0	12.8	23.0	0.0	26.0	18.1	0.0	19.0
Incr Delay (d2), s/veh	0.5	0.0	3.1	0.3	4.8	0.1	0.3	0.0	2.6	2.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	7.0	0.3	7.8	0.4	0.8	0.0	1.4	3.2	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.5	0.0	20.4	14.0	22.9	12.8	23.3	0.0	28.6	20.2	0.0	19.2
LnGrp LOS	B	A	C	B	C	B	C	A	C	C	A	B
Approach Vol, veh/h		625			678			165			330	
Approach Delay, s/veh		19.8			21.7			26.5			20.0	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	27.9	7.7	18.7	7.5	27.3	15.0	11.5
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	4.0	34.0	4.0	28.0	4.0	34.0	10.0	22.0
Max Q Clear Time (g_c+I1), s	2.8	18.7	4.0	3.5	3.3	19.8	10.1	5.4
Green Ext Time (p_c), s	0.0	2.3	0.0	0.2	0.0	2.5	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	21.2
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	791	83	319	517	210	166	102	355	401	152	56
Future Volume (veh/h)	42	791	83	319	517	210	166	102	355	401	152	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1870	1900	1885	1870	1693	1885	1870	1885	1856	1870	1900
Adj Flow Rate, veh/h	46	860	0	347	562	0	180	111	386	436	165	48
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	2	0	1	2	14	1	2	1	3	2	0
Cap, veh/h	58	1870		428	1617		375	391	529	536	217	63
Arrive On Green	0.03	0.37	0.00	0.12	0.45	0.00	0.21	0.21	0.21	0.16	0.16	0.16
Sat Flow, veh/h	1697	5274	0	3483	3554	1434	1795	1870	1593	3428	1391	405
Grp Volume(v), veh/h	46	860	0	347	562	0	180	111	386	436	0	213
Grp Sat Flow(s),veh/h/ln	1697	1702	0	1742	1777	1434	1795	1870	1593	1714	0	1796
Q Serve(g_s), s	3.0	14.1	0.0	10.7	11.3	0.0	9.7	5.5	23.0	13.5	0.0	12.5
Cycle Q Clear(g_c), s	3.0	14.1	0.0	10.7	11.3	0.0	9.7	5.5	23.0	13.5	0.0	12.5
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.23
Lane Grp Cap(c), veh/h	58	1870		428	1617		375	391	529	536	0	281
V/C Ratio(X)	0.79	0.46		0.81	0.35		0.48	0.28	0.73	0.81	0.00	0.76
Avail Cap(c_a), veh/h	170	1870		697	1617		375	391	529	748	0	392
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.60	0.60	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.7	26.6	0.0	47.0	19.4	0.0	38.2	36.6	32.4	44.9	0.0	44.4
Incr Delay (d2), s/veh	8.6	0.5	0.0	2.3	0.6	0.0	0.6	0.2	4.7	3.9	0.0	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	5.8	0.0	4.8	4.8	0.0	4.3	2.5	9.6	6.0	0.0	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.3	27.1	0.0	49.3	20.0	0.0	38.8	36.8	37.1	48.7	0.0	48.5
LnGrp LOS	E	C		D	C		D	D	D	D	A	D
Approach Vol, veh/h		906			909			677			649	
Approach Delay, s/veh		28.8			31.2			37.5			48.6	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.5	44.3		21.2	7.8	54.0		27.0				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	22.0	24.0		24.0	11.0	35.0		23.0				
Max Q Clear Time (g_c+I1), s	12.7	16.1		15.5	5.0	13.3		25.0				
Green Ext Time (p_c), s	0.8	3.7		1.5	0.0	4.2		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		35.5	
HCM 6th LOS		D	

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.