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Norwood Apartments

Transportation Impact Analysis

Tualatin, Oregon

Date:
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RENEWS: 12/31/2023

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Executive Summary

As summarized in the key findings below, the proposed Norwood Apartments project will create a minor impact on the transportation system, which will be mitigated by the recommended traffic signal at the intersection of SW Boones Ferry Road & Norwood Road. The traffic signal is warranted under background conditions without the proposed project, and the long-term analysis of the reasonable worst case scenario traffic analysis of the existing zone concludes that the SW Boones Ferry Road & SW Norwood Road intersection will fail without a signal. However, if the project installs a signal at that intersection, then the existing near-term and long-term problem is solved. The project's traffic is mitigated so that the street network performance standards are met and the zone change will not require any additional mitigation or change in classification.

Overview

1. The proposed Norwood Apartments project includes the development of a 276-unit apartment complex on a site located south of SW Norwood Road and east of SW Boones Ferry Road in Tualatin, Oregon. The project site consists of two lots (Tax Lot 2S135D 000108 and a portion of Tax Lot 2S135D 000106) with an approximate total of 9.2 acres.
2. The application will require rezoning the site from Institutional (IN) and Medium Low Density Residential (RML) to High Density-High Rise Residential (RH-HR).
3. The site will take access from SW Norwood Road. An emergency access connection to the Horizon School circulation network is also provided.

Proposed Zone Change Findings

4. To understand the potential impacts of the requested zone change, the reasonable worst-case land uses under existing and proposed zoning were compared. Under existing zoning, the residentially-zoned land was assumed to redevelop to its maximum density with 25 attached homes while the institutionally-zoned land was assumed to develop with a 250-student private school. The proposed development of 276 apartments is the maximum density under the proposed zoning.
5. The existing zoning would likely generate a greater number of trips during the morning peak hour, when congestion associated with schools is most prevalent. However, the proposed zoning could generate a greater number of trips in the evening peak hour; thus, a TPR analysis was performed.
6. A comparison of long-term operations with the existing and proposed zoning shows that the proposed zoning would have a significant effect that can be mitigated with a traffic signal at the intersection of SW Boones Ferry Road & SW Norwood Road, to be installed by the applicant at the time of development. This proposal is consistent with the mitigation recommended to address the impacts of the proposed development in the TIA.

Traffic Impact Analysis Findings

7. The Norwood Apartments project could be characterized as two different land use categories, low-rise multifamily housing or mid-rise multifamily. This analysis uses the more conservative (e.g., assumes a higher level of traffic) land use category, low-rise multifamily housing, as requested by the City of Tualatin. The trip generation calculations show that the proposed Norwood Apartments development is estimated to

generate a net increase of 107 trips during the morning peak hour, 137 trips during the evening peak hour, and 1,826 daily trips during the average weekday.

8. In general, impacts from the proposed project are expected to be minor. All study intersections show operational results that meet standards under all analysis scenarios except for the intersection of SW Boones Ferry Road & SW Norwood Road if it remains unsignalized. However, with the recommended signal installation, this intersection will be improved to meet agency standards.

9. In general, changes in 95th percentile queuing between the year background and buildout conditions are anticipated to be small, one vehicle or two vehicles. As with the operational findings, one intersection is anticipated to have significant growth in queues: SW Boones Ferry Road & SW Norwood Road. However, with the recommended signal installation, queueing will be consistently improved.

10. A traffic signal is recommended at the intersection of SW Boones Ferry Road & SW Norwood Road. With a signal but no widening on SW Norwood Road, the overall intersection v/c ratio will meet the City mobility standard of LOS D and the County mobility target of 0.90. On the westbound approach, delays will be shorter than background conditions without the proposed project and recommended traffic signal. The queuing analysis shows that even with five years of additional growth, the 95th percentile queues on the shared westbound approach will not extend to the first driveway on SW Norwood Road. Therefore, widening SW Norwood Road to include a westbound right-turn lane or widening SW Boones Ferry Road to lengthen the northbound right-turn lane should not occur until the adjacent parcels redevelop.

11. Traffic signal warrants are met under both background and buildout conditions at the intersection of SW Boones Ferry Road & SW Norwood Road. Installing a traffic signal at the intersection of SW Boones Ferry Road & SW Norwood Road is a recommended mitigation measure.

12. Traffic signal warrants are not met at the site access intersection with SW Norwood Road or at the unsignalized intersection of SW Norwood Road & SW 82nd Avenue.

13. Left-turn lane warrants are not met at the proposed site access intersection on SW Norwood Road for either peak hour under the 2026 buildout scenario for any analysis period.

14. At the proposed site accesses on SW Norwood Road, dense foliage restricts existing sight lines; however, preliminary assessment or horizontal and vertical curvature indicate that the 500-foot sight distance requirement is expected to be satisfied.

15. On SW Norwood Road, the minimum access spacing standard of 100 feet will be met with construction of the proposed site access.

16. Based on a review of the most recent five years of available crash data, no significant trends or crash patterns were identified at any of the study intersections. Accordingly, no safety mitigation is recommended per the crash data analysis.

Project Description

Introduction

The proposed Norwood Apartments project includes the development of a 276-unit apartment complex on a site located south of SW Norwood Road and east of SW Boones Ferry Road in Tualatin, Oregon. The application will require rezoning the site from Institutional (IN) and Medium Low Density Residential (RML) to High Density/High Rise Residential (RH-HR). The site will take all access from SW Norwood Road.

The purposes of this study are to determine whether the transportation system within the vicinity of the site is capable of safely and efficiently supporting the proposed development, to determine any mitigation that may be necessary to do so, and to demonstrate compliance with the Transportation Planning Rule (TPR).

Based on prior scoping coordination with the City of Tualatin and Washington County, the report includes safety and capacity analyses at 6 intersections:

1. SW Boones Ferry Road & SW Ibach Street
2. SW Boones Ferry Road & SW Norwood Road
3. Site Access & SW Norwood Road (future intersection)
4. SW 82nd Avenue & SW Norwood Road
5. SW Boones Ferry Road & Basalt Creek Parkway Extension (future intersection)
6. SW Boones Ferry Road & SW Day Road

Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations are included in the appendix to this report.

Location Description

The project site consists of tax lots 2S135D 000108 and 2S135D 000106. Lot 108 includes a 1.0-acre parcel located at 9300 SW Norwood Road and is currently occupied by one single-family home. The lot is currently outside the City of Tualatin with a Washington County zoning designation of FD-20; once annexed, the lot will be zoned Medium Low Density Residential (RML).

Lot 106 includes an 8.2-acre portion of the parcel located at 23370 SW Boones Ferry Road, which is part of the Horizon Christian School property. The portion of this lot to be redeveloped is currently zoned Institutional (IN) and is occupied by one single-family home. It is also developed with a parking lot with approximately 120 striped spaces. Both parcels are proposed for rezoning to High Density/High Rise Residential (RH-HR).

The proposed Norwood Apartments development includes the development of six 4-story buildings totaling 276 apartments on the site. Future access to the site will be provided via one new driveway along SW Norwood Road. An emergency access connection to the Horizon School circulation network is also provided.

A site plan is included in Appendix A and the site location is shown in Figure 1 with the project site outlined in yellow.

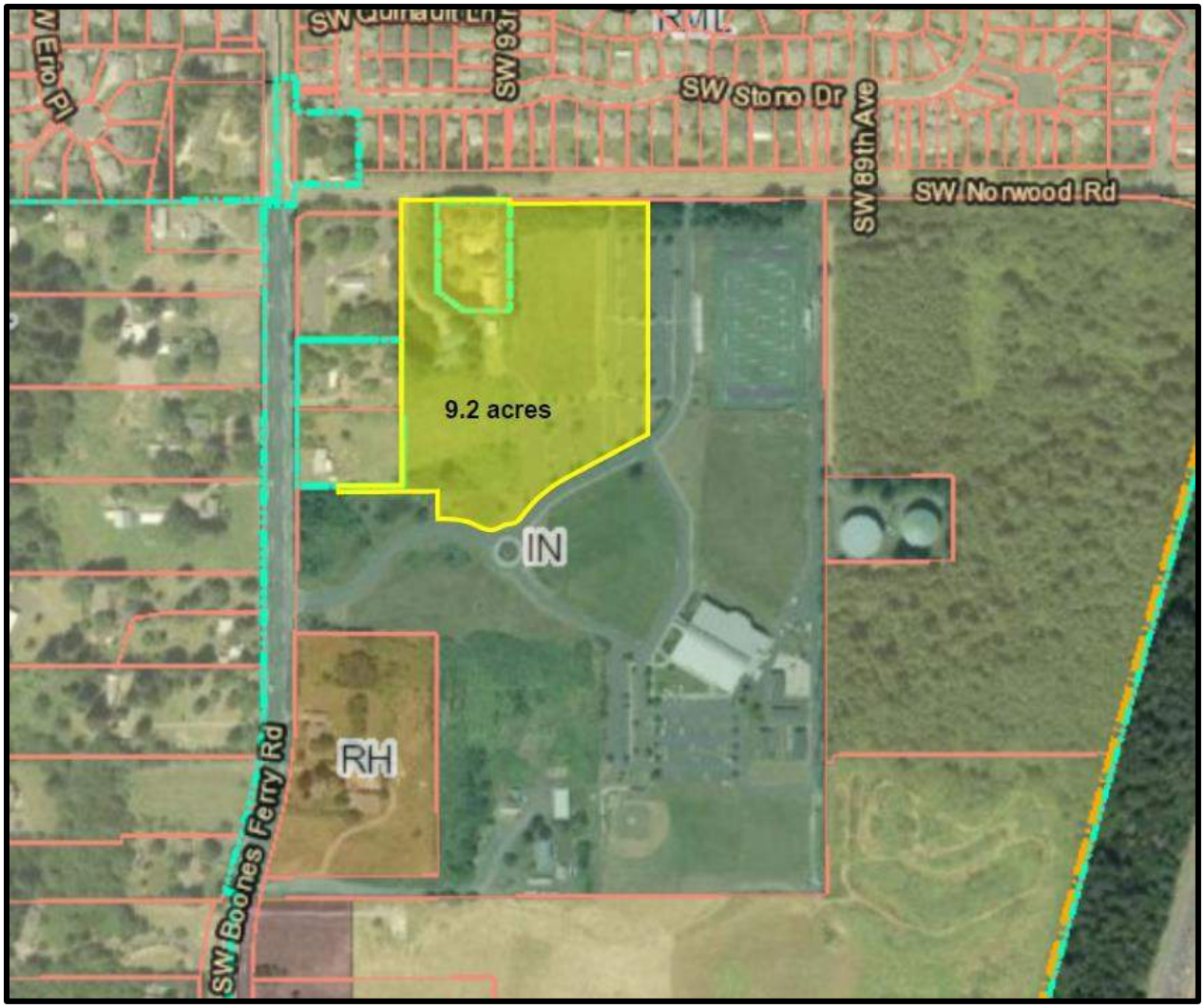


Figure 1: Project Location (Source: City of Tualatin Interactive Zoning Map)

Vicinity Streets

Five roadways within the study area are expected to be impacted by the proposed development. The characteristics of these roadways are summarized in Table 1.

Study Intersections

Through coordination with the City of Tualatin and Washington County, six study intersections were identified for evaluation. The existing characteristics of these intersections are summarized in Table 2. A vicinity map showing the project site, vicinity streets, and study intersection configurations is shown in Figure 2.

Table 1: Roadway Characteristics

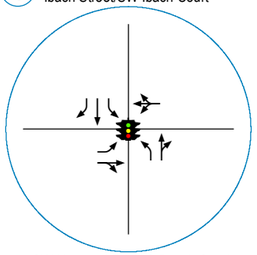
Street Name	Jurisdiction	Functional Classification	Posted Speed	Curbs & Sidewalks	On-Street Parking	Bicycle Facilities
SW Boones Ferry Road	City of Tualatin / Washington County	Major Arterial / Arterial	35 / 45 mph[1]	Partial Both Sides	None	Bike Lanes
SW 82nd Avenue	Washington County	Major Collector	45 mph	None	None	None
SW Ibach Street / Court	City of Tualatin	Major Collector / Local	35 / 25 mph	Both Sides	None	Bike Lanes
SW Norwood Road	Washington County	Collector (Major Collector[2])	45 mph	Both Sides	None	None
SW Day Road	City of Wilsonville	Major Arterial	40 mph	South Side	None	Bike Lanes

Notes:
1. Speed increases from 35 mph to 45 mph south of SW Norwood Road.
2. City of Tualatin Classification.

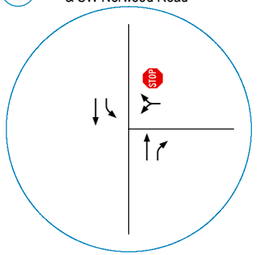
Table 2: Vicinity Intersection Descriptions

Intersection		Geometry	Traffic Control	Phasing/Stopped Approaches
1	SW Boones Ferry Road & SW Ibach Street/SW Ibach Court	Four-Legged	Signalized	Protected NB Left/ Permitted EB/WB/SB Left
2	SW Boones Ferry Road & SW Norwood Road	Three-Legged	Stop-Controlled	WB Stop-Controlled
3	Site Access & SW Norwood Road (future intersection)	Three-Legged	Stop-Controlled	NB Stop-Controlled
4	SW 82nd Avenue & SW Norwood Road	Three-Legged	Stop-Controlled	NB/SB Stop-Controlled Except SB Free Right
5	SW Boones Ferry Road & Basalt Creek Parkway Extension (future intersection)	Three-Legged	Signalized	Protected/Permitted NB Left w/ EB Right Turn Overlap
6	SW Boones Ferry & SW Day Road	Four-Legged	Signalized	Protected NB/SB Lefts Permitted EB/WB Lefts w/ EB Right Turn Overlap

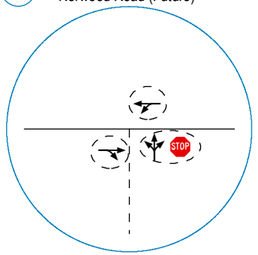
1 SW Boones Ferry Road & SW Ibach Street/SW Ibach Court



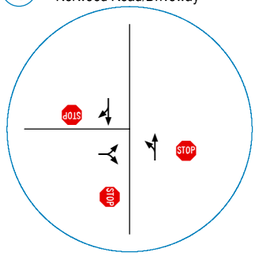
2 SW Boones Ferry Road & SW Norwood Road



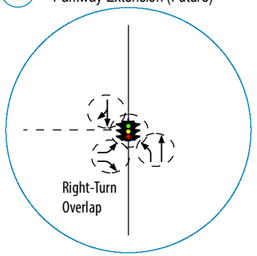
3 Site Access & SW Norwood Road (Future)



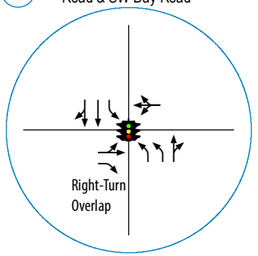
4 SW 82nd Avenue & SW Norwood Road/Driveway



5 SW Norwood Road & Basalt Creek Parkway Extension (Future)



6 SW Boones Ferry Road & SW Day Road



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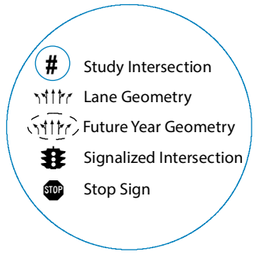

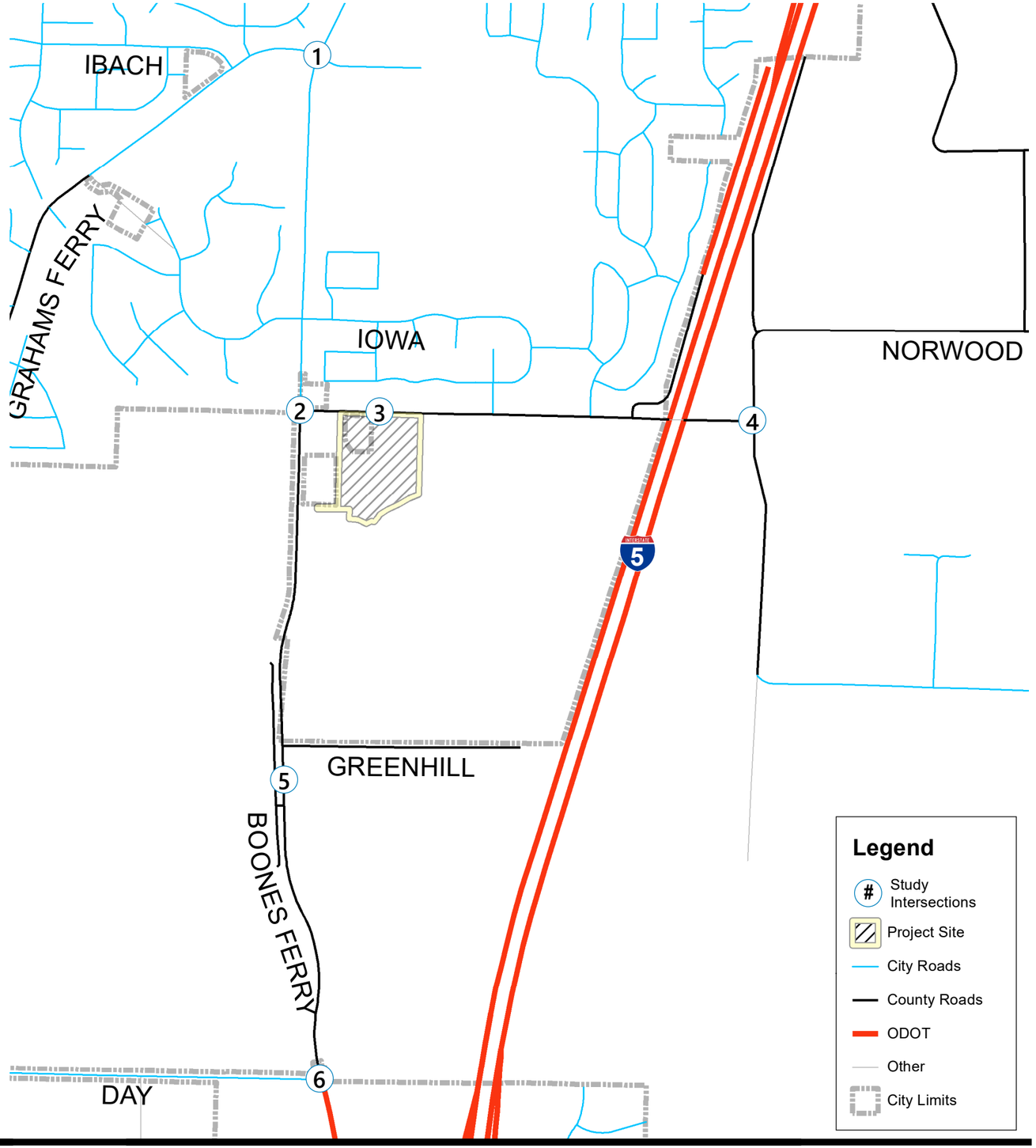

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Vicinity Map

NOT TO SCALE

Figure 2
Norwood Apartments TIA
2/2/2023

Public Transit

The project is located near one transit line that has stops within less than a one-quarter mile walking/biking distance of the site.

Route 96 – Tualatin/I-5 provides weekday rush-hour service between Commerce Circle and the Mohawk Park & Ride in Tualatin, and regular service between Mohawk Park & Ride and Portland City Center. Weekday service is scheduled from approximately 5:15 AM to 9:10 PM with headways of approximately 30 to 60 minutes. There is currently no weekend or holiday service. The nearest bus stops to the site are currently located just south of the intersection of SW Boones Ferry Road at SW Norwood Road.

Site Trips

The proposed development consists of six 4-story buildings totaling 276 apartments. All access will be taken from SW Norwood Road.

Trip Generation

To estimate the number of trips that will be generated by the proposed development, trip rates from the *Trip Generation Manual*[1] were used. Rates from land use code 210, *Single-Family Detached Housing*, were used to estimate existing site trip generation based on the number of dwelling units. City staff requested land use code 220, *Multifamily Housing (Low-Rise)*[2] be used to estimate the proposed trip generation of the 276 apartment units; therefore, this assumption was used in the trip estimates presented in Table 3.

As shown in Table 3, the trip generation calculations as requested by the City show that the proposed Norwood Apartments development is estimated to generate a net increase of 107 trips during the morning peak hour, 137 trips during the evening peak hour, and 1,826 daily trips during the average weekday. Detailed calculation worksheets are provided in Appendix A.

Table 3: Trip Generation Summary

ITE Code – Land Use	Intensity (DU)	Morning Peak Hour			Evening Peak Hour			Weekday Trips
		In	Out	Total	In	Out	Total	
Existing								
210 - Single-Family Detached Housing	-2	0	-1	-1	-1	-1	-2	-18
Propose								
220 - Multifamily Housing (Low-Rise)	276	26	82	108	88	51	139	1,844
Net New Trips		26	81	107	87	50	137	1,826

Trip Distribution

The directional distribution of site trips to/from the project site was assumed to be the same as the distribution used for other approved projects in the area. That trip distribution was estimated based on the locations of likely trip destinations, locations of major transportation facilities in the site vicinity, and a select zone analysis using Metro's Regional Travel Demand Forecasting Model. An additional consideration was Google Maps estimated travel times along various routes to/from the site.

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 10th Edition, 2017.

[2] As the proposed apartments will be four stories, ITE guidance suggests that the appropriate land use code for the development is 221, *Multifamily Housing (Mid-Rise),* which includes data for apartment complexes ranging from four to 10 stories. Trip rates for this land use are generally lower during the evening peak and over the course of the day than those for land use code 220, *Multifamily Housing (Low-Rise)*, which includes data for apartment complexes ranging from one to three stories. Using the low-rise multifamily housing option provides a more conservative estimate of trip generation.

The initial distribution, prior to the construction of the Basalt Creek Parkway Extension, is summarize below:

- Approximately 40 percent of site trips will travel to/from the north on SW Boones Ferry Road
    - Approximately 3 percent will travel to/from uses south of SW Ibach Road
    - Approximately 5 percent will travel to/from SW Ibach Road
    - Approximately 32 percent will travel to/from areas north of SW Ibach Road
- Approximately 45 percent of site trips will travel to/from the south on SW Boones Ferry Road
    - Approximately 10 percent will travel to/from SW Day Road
    - Approximately 35 percent will travel to/from areas south of SW Day Road
- Approximately 15 percent of site trips will travel to/from the east on SW Norwood Road

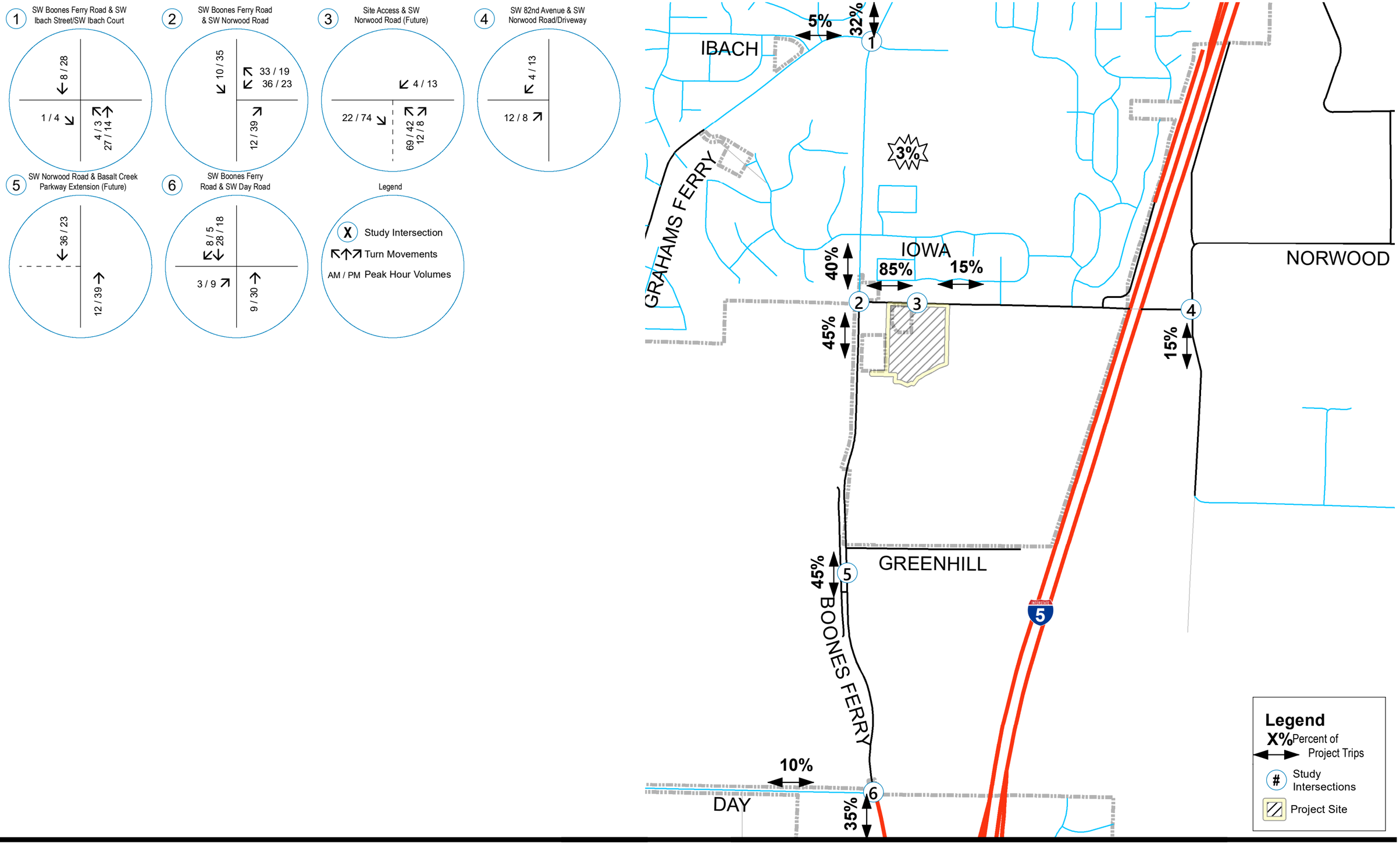
The anticipated project trip distribution and assignment of site trips generated during the morning and evening peak hours is provided in Figure 3.

Basalt Creek Parkway Extension

Washington County is currently engineering the extension of the Basalt Creek Parkway eastward from SW Grahams Ferry Road to SW Boones Ferry Road at a connection just south of SW Greenhill Lane. Although funding for construction has not been secured yet, both city and county staff requested an analysis of the study area with the extension. The following changes in trip distribution with the Basalt Creek Parkway Extension anticipated are:

- Shift five (5) percent of project trips heading north on SW Boones Ferry Road (continuing onto SW Ibach Street and SW Avery Street) to the Basalt Creek Parkway Extension.
- Shift eight (8) percent of project trips heading south on SW Boones Ferry Road (continuing onto SW Day Road) to the Basalt Creek Parkway Extension.

These changes are not anticipated to change the project study area. The resulting project trip distribution and assignment of site trips generated during the morning and evening peak hours with the Basalt Creek Parkway Extension is provided in Figure 4.



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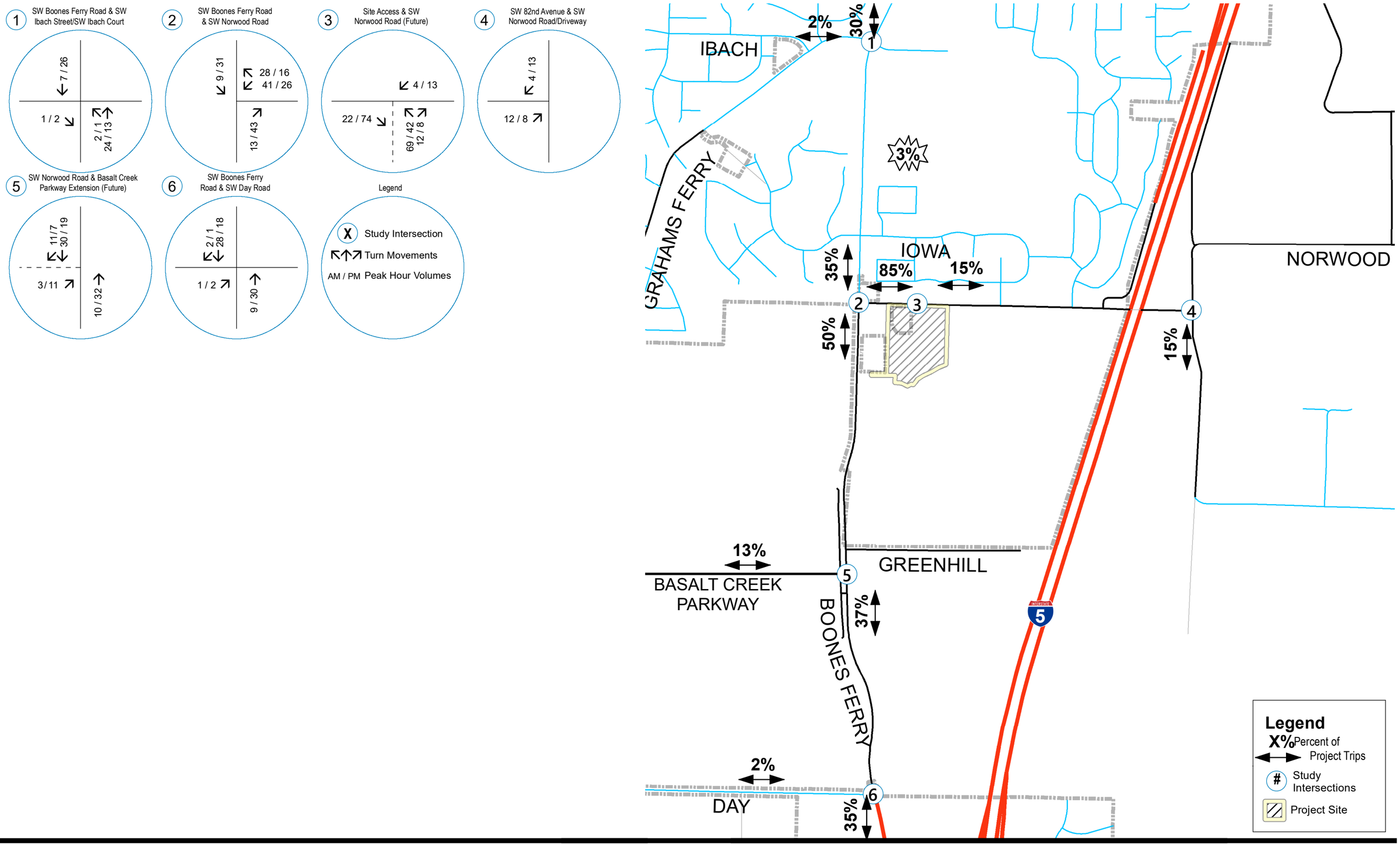
TRAFFIC VOLUMES
Trip Distribution & Assignment
No Basalt Creek Parkway Extension

NOT TO SCALE

Figure 3
Norwood Apartments TIA
2/2/2023



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TRAFFIC VOLUMES
Trip Distribution & Assignment
with Basalt Creek Parkway Extension

NOT TO SCALE

Figure 4
Norwood Apartments TIA
2/2/2023

Traffic Volumes

Existing Conditions

Traffic counts were conducted at the study intersections on Thursday, October 20th, 2022, from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM. Additionally, a 12-hour count (7:00 AM to 7:00 PM) from September 29, 2021, was obtained for the intersection of SW Boones Ferry Road & SW Norwood Road. Counts were collected while school was in session, and no COVID-19 adjustments were used as traffic volumes have largely stabilized.

The year 2022 data was summarized for each intersection's respective morning and evening peak hours. At the intersection of SW Boones Ferry Road & SW Norwood Road, peak hour data was also summarized for the year 2021. During the morning peak hour, the year 2021 peak hour counts were lower than the 2022 peak hour counts; therefore, only the 2022 count data were used. During the evening peak hour, the year 2021 peak hour counts were higher for some but not all turning movements; therefore, an average of the two traffic counts was used. Additionally, the through volumes on SW Boones Ferry Road at SW Ibach Road and SW Day Road were also increased to reflect the higher demand.

Figure 5 shows the existing traffic volumes at the study intersections during the morning and evening peak hours.

Background Conditions

To provide analysis of the impact of the proposed development on the nearby transportation facilities, an estimate of future traffic volumes is required. Two components were included in the background traffic estimates: 1) general growth and 2) growth associated with planned developments.

For the background growth, a short-term annual growth rate of two percent per year was applied to the year 2022 existing traffic volumes. This growth rate is generally consistent with historical growth rates on study area roadways although conservatively higher than trends on SW Boones Ferry Road.

Two projects were assumed for the in-process development. The affordable housing development known as Plambeck Gardens is planned to be constructed to the south of the project site along SW Boones Ferry Road. The buildout year for this project was assumed to be 2025. The Autumn Sunrise housing development is planned to be constructed east and south of the project site, taking access via SW Boones Ferry Road and SW Norwood Road. The buildout year for this project was assumed to be 2026. Therefore, trip assignment associated with both nearby developments were included in the 2026 background year scenario. Detailed project trip information for both planned developments can be found in Appendix B.

Figure 6 shows the projected year 2026 background traffic volumes at the study intersections during the morning and evening peak hours.

Background Year 2026 with Basalt Creek Parkway Extension

Washington County is currently engineering the extension of the Basalt Creek Parkway eastward from SW Grahams Ferry Road to SW Boones Ferry Road at a connection just south of SW Greenhill Lane. Engineering is under way but construction is contingent on securing funding for the project.

Since funding and the construction timeline are indefinite, this project was not assumed as part of the base transportation network. However, an analysis scenario with the planned project has been developed to understand how it might change traffic operations with the proposed project. A County study for[3] this phase of the Basalt Creek Parkway project was provided for the new intersection created by the extension to SW Boones Ferry Road for the year 2023. Although the projections did not address other study area intersections, year 2015 base year and year 2040 future year model forecasts were also obtained from Washington County and Metro.

To develop background volumes for a year 2026 background condition, the following assumptions were made:

- The year 2023 forecast volumes for the intersection of SW Boones Ferry Road and the Basalt Creek Parkway Extension were compared with the existing year 2022 volumes on SW Boones Ferry Road. Since the volumes were comparable, the forecasts were assumed as year 2022 volumes for the new intersection.
- Increases in traffic volumes on SW Boones Ferry Road due to the Basalt Creek Parkway Extension were added to through movements at the intersections north and south of the new intersection.
- Based on the model forecasts, the following traffic shifts were assumed to estimate study area traffic with completion of the extension:
    - 50 percent of the northbound traffic currently turning left from SW Boones Ferry Road to SW Day Road will continue traveling northward and turn left on the Basalt Creek Parkway Extension.
    - 50 percent of the eastbound traffic currently turning right from SW Day Road to SW Boones Ferry Road will travel along the Basalt Creek Parkway Extension and turn right on SW Boones Ferry Road at the new intersection.
    - 50 percent of the southbound traffic currently turning right from SW Boones Ferry Road to SW Day Road will turn on the Basalt Creek Parkway Extension instead of continuing south to SW Day Road.
    - 50 percent of the eastbound traffic currently turning left from SW Day Road to SW Boones Ferry Road will travel along the Basalt Creek Parkway Extension and turn left onto SW Boones Ferry Road at the new intersection.
    - 25 percent of the eastbound traffic currently turning left from SW Ibach Road to SW Boones Ferry Road will have diverted to the Basalt Creek Parkway Extension.
    - 25 percent of the southbound traffic currently turning right from SW Boones Ferry Road to SW Ibach Road will have diverted to the Basalt Creek Parkway Extension.
- Once year 2022 traffic volumes were developed to reflect the Basalt Creek Parkway Extension, an annual growth rate of 2 percent per year was applied and the in-process traffic was added.

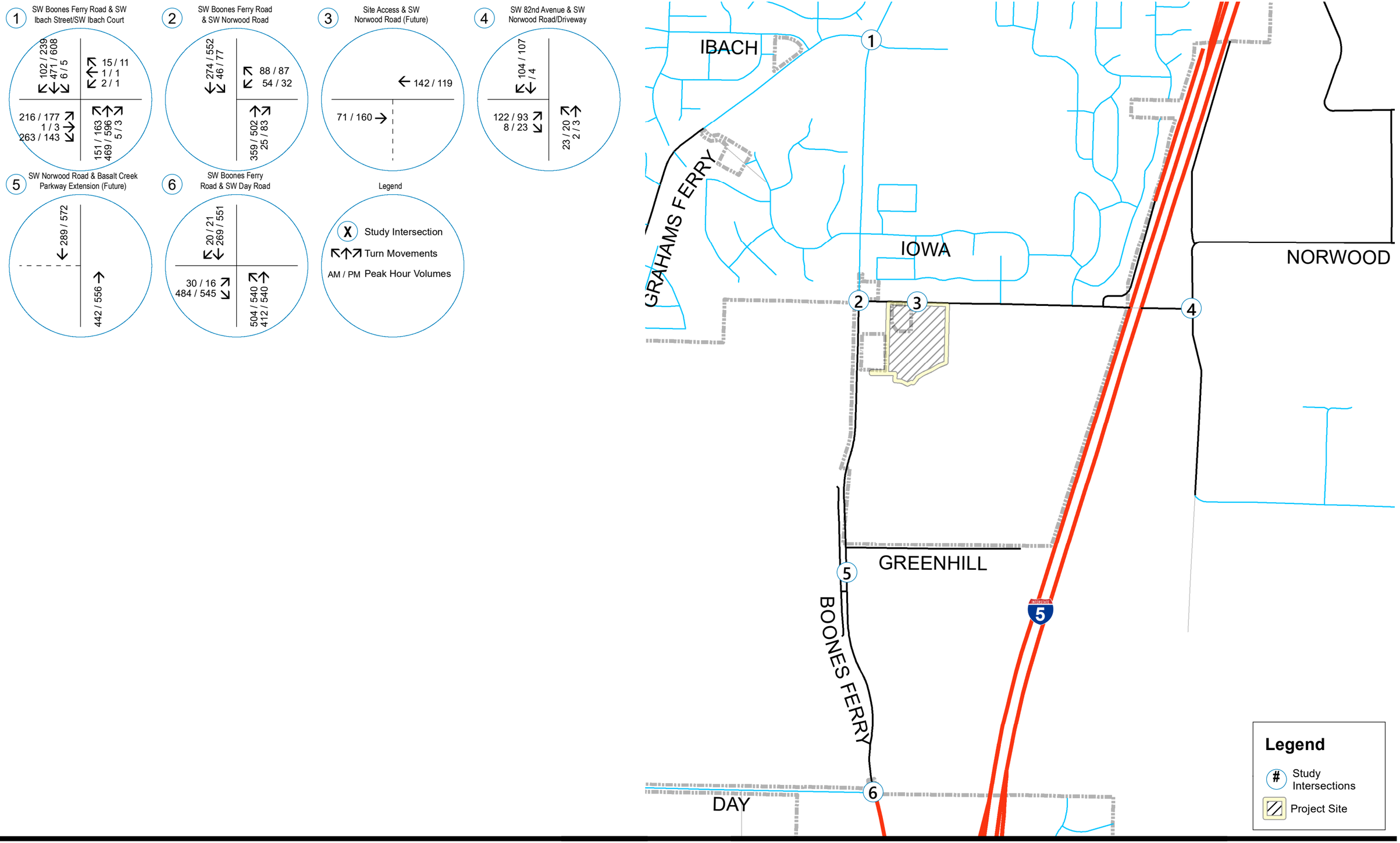
Figure 7 shows the projected year 2026 background traffic volumes at the study intersections during the morning and evening peak hours with the Basalt Creek Parkway Extension in place.

[3] DKS Associates, "Washington County Basalt Creek Extension – Traffic Analysis Memorandum," January 16, 2020.

Buildout Conditions

The project is proposed to be occupied by the year 2026, so 2026 is used as the buildout year. Peak hour trips calculated to be generated by the proposed development, as described earlier within the *Site Trips* section, were added to the projected year 2026 background traffic volumes to obtain the expected 2026 site buildout volumes.

Figure 8 shows the projected year 2026 buildout traffic volumes at the study intersections during the morning and evening peak hours and Figure 9 shows the projected year 2026 buildout traffic volumes at the study intersections during the morning and evening peak hours with the Basalt Creek Parkway Extension in place.



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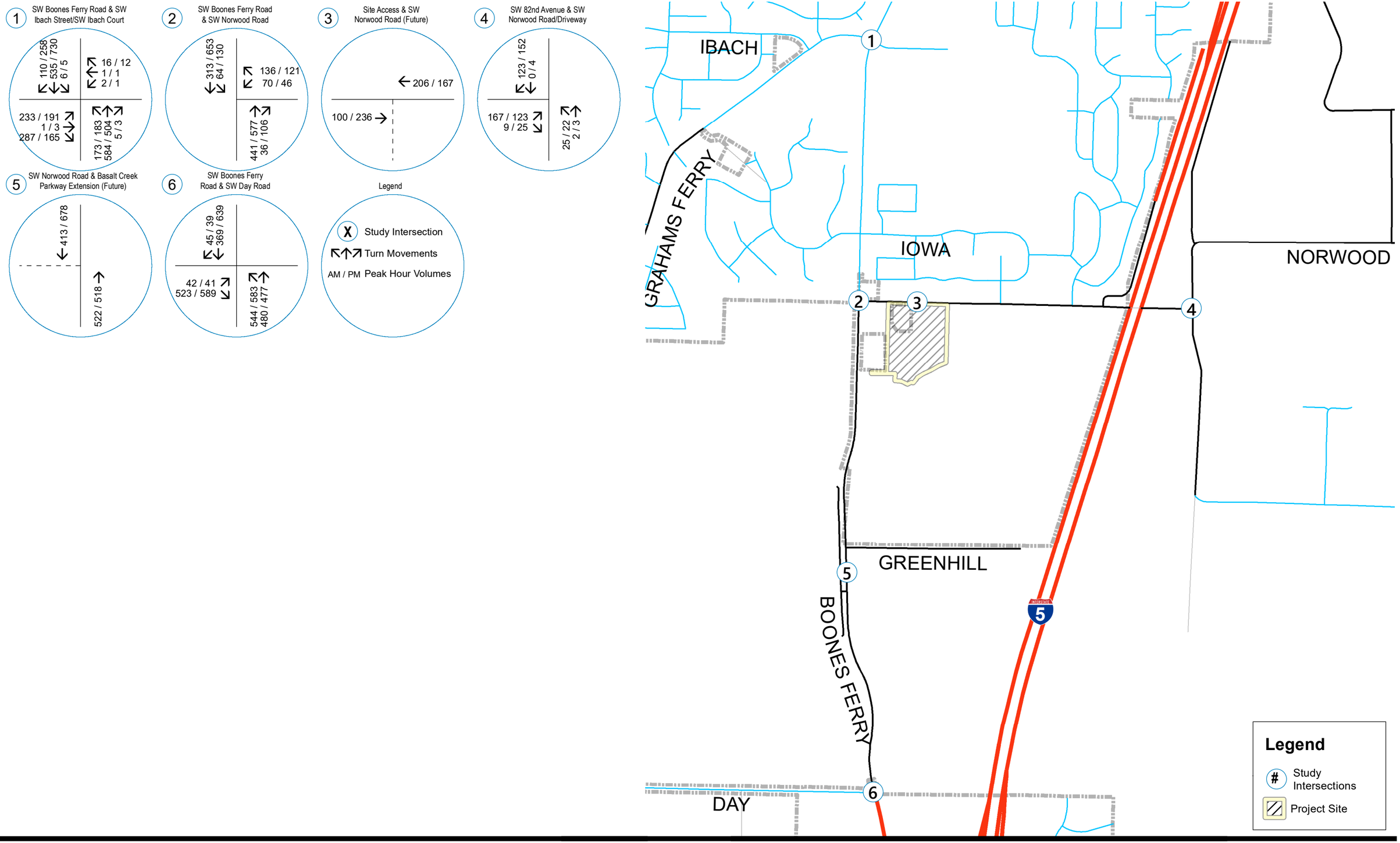
TRAFFIC VOLUMES
Year 2022 Existing Conditions

NOT TO SCALE

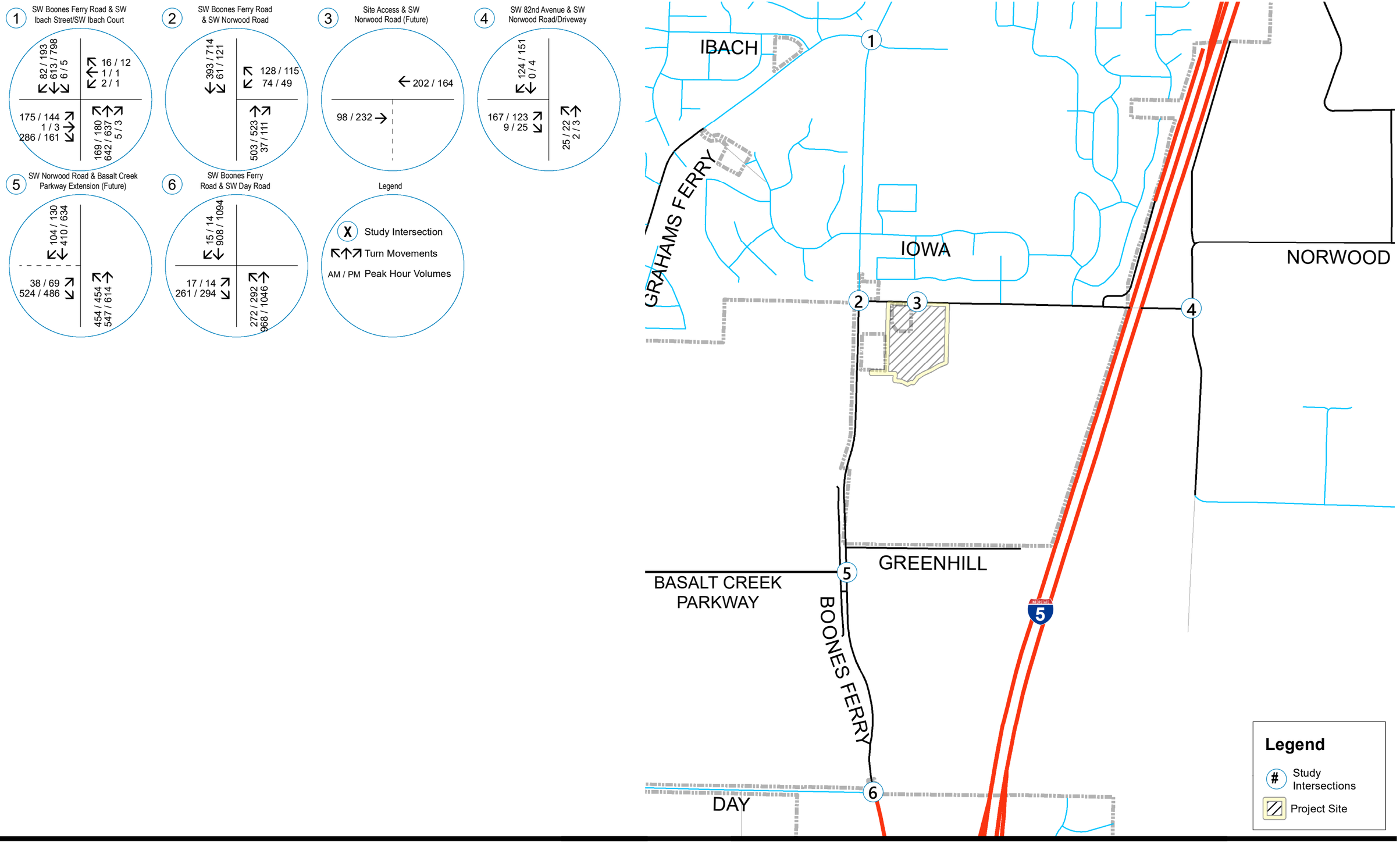
Figure 5
Norwood Apartments TIA
2/2/2023



TRAFFIC VOLUMES
Year 2026 Background Conditions
No Basalt Creek Parkway Extension

NOT TO SCALE

Figure 6
Norwood Apartments TIA
2/2/2023



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TRAFFIC VOLUMES

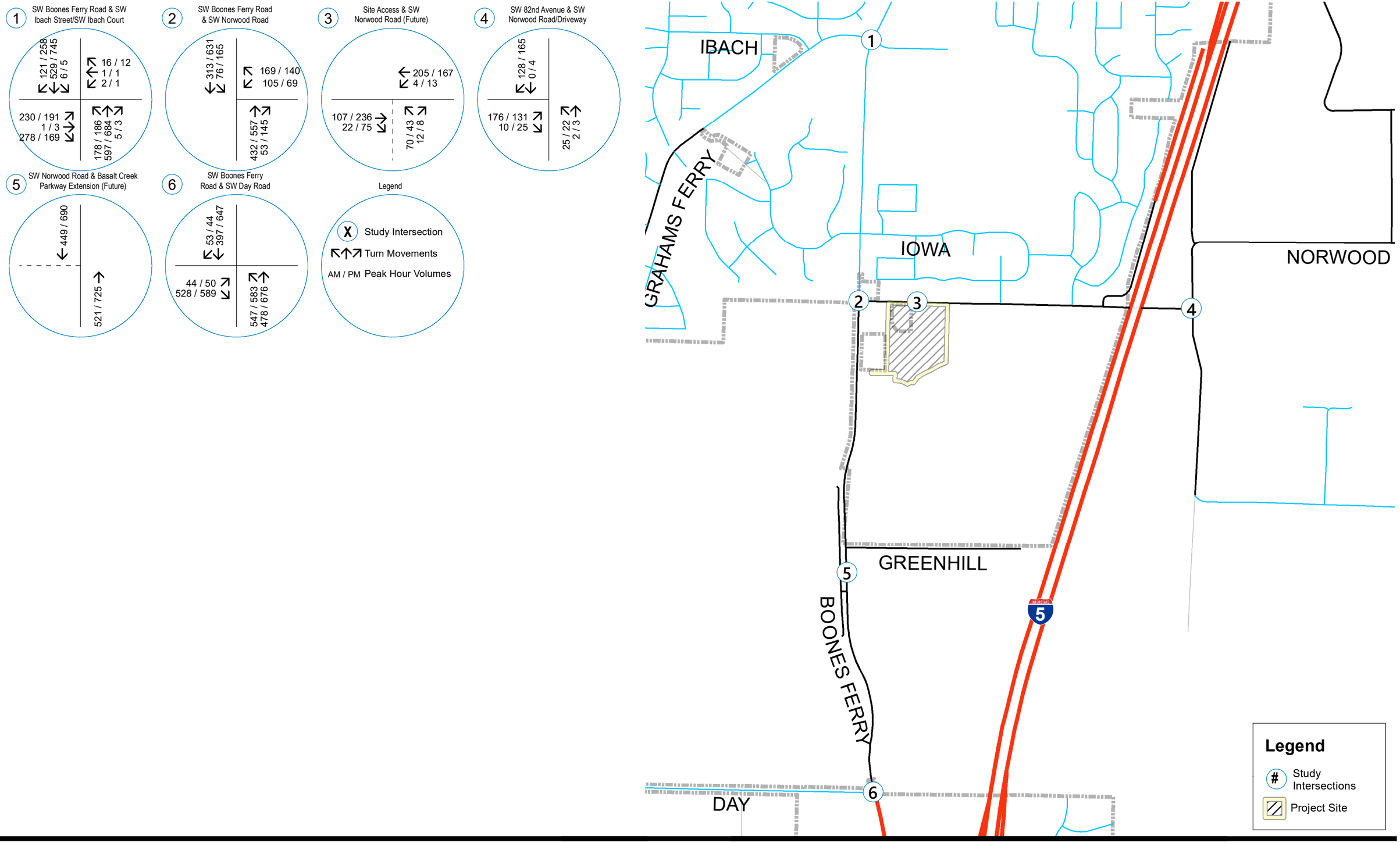
Year 2026 Background Conditions with Basalt Creek Parkway Extension

NOT TO SCALE

Figure 7

Norwood Apartments TIA

2/2/2023



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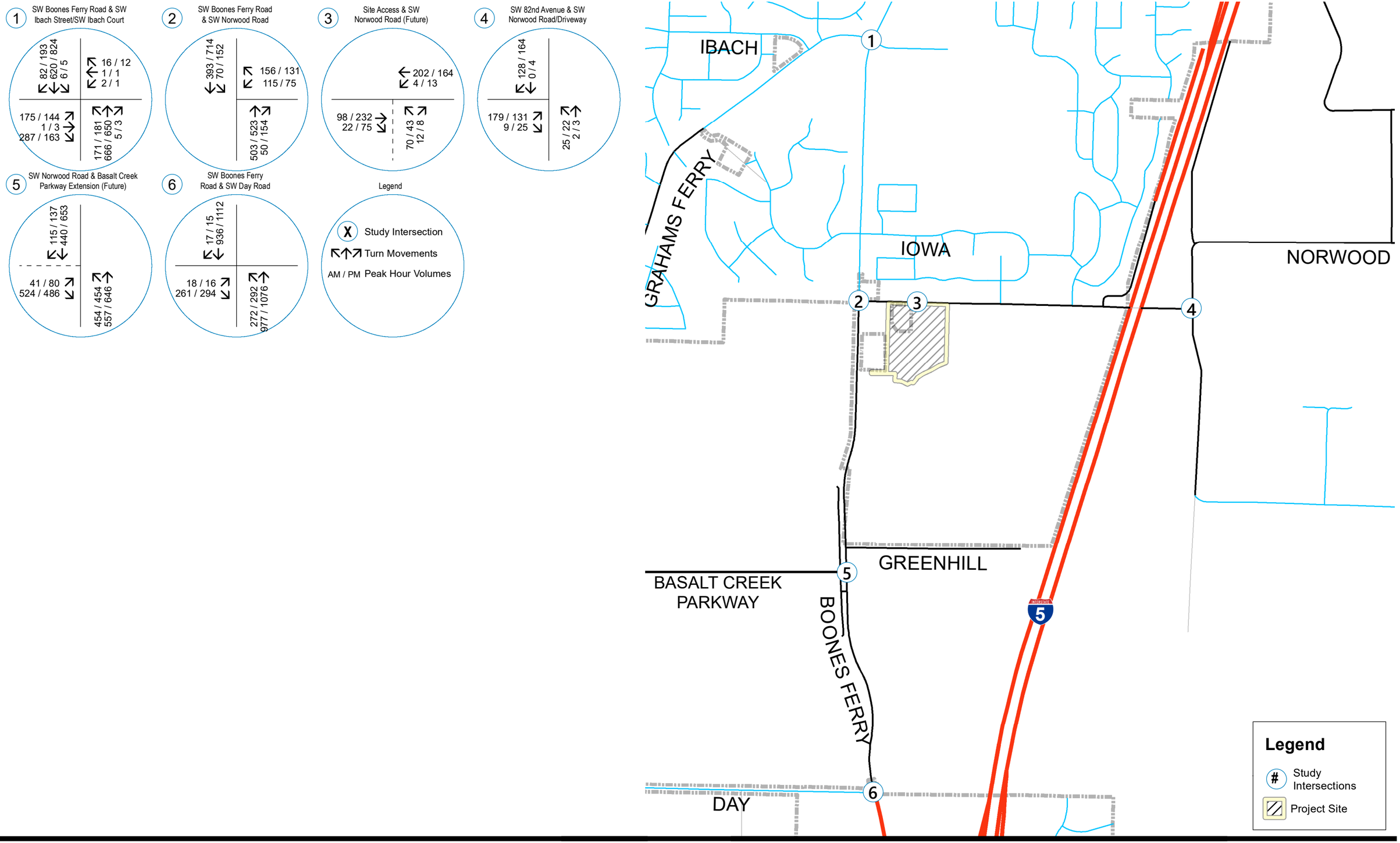
TRAFFIC VOLUMES
Year 2026 Buildout Conditions
No Basalt Creek Parkway Extension

NOT TO SCALE

Figure 8
Norwood Apartments TIA
2/2/2023



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TRAFFIC VOLUMES
Year 2026 Buildout Conditions
with Basalt Creek Parkway Extension

NOT TO SCALE

Figure 9
Norwood Apartments TIA
2/2/2023

Safety Analysis

Crash History Review

Using data obtained from ODOT's Crash Data System, a review of approximately five years of the most recent available crash history (January 2016 through December 2020) was performed at the study intersections. The crash data was evaluated based on the number of crashes, the type of collisions, and the severity of the collisions. Crash severity is based on injuries sustained by people involved in the crash, and includes five categories:

- Property Damage Only (PDO)
- Possible Injury (Injury C)
- Non-Incapacitating Injury (Injury B)
- Incapacitating Injury (Injury A)
- Fatality or Fatal Injury

Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak period represents approximately 10 percent of the annual average daily traffic (ADT) at the intersection.

Table 4 provides a summary of crash types while Table 5 summarizes crash severities and crash rates for each of the study intersections. Detailed ODOT crash reports are included in Appendix C.

Table 4: Crash Type Summary

Intersection		Crash Type								Total Crashes
		Rear End	Turning	Fixed Object	Angle	Bicycle	Head On	Ped Involved	Sideswipe	
1	SW Boones Ferry Road & SW Ibach Street/Court	6	1	1	0	0	0	1	0	9
2	SW Boones Ferry Road & SW Norwood Road	2	4	1	0	0	0	0	0	7
4	SW 82nd Avenue & SW Norwood Road	0	0	0	0	0	0	0	0	0
6	SW Boones Ferry Road & SW Day Road	21	4	1	0	0	1	0	2	29

Table 5: Crash Severity and Rate Summary

Intersection		Crash Severity					Total Crashes	PHV	Crash Rate	90th % Rate
		PDO	C	B	A	Fatal				
1	SW Boones Ferry Road & SW Ibach Street/Court	3	5	1	0	0	9	1,950	0.25	0.860
2	SW Boones Ferry Road & SW Norwood Road	6	1	0	0	0	7	1,333	0.29	0.293
4	SW 82nd Avenue & SW Norwood Road	0	0	0	0	0	0	250	0.00	0.408
6	SW Boones Ferry Road & SW Day Road	16	11	1	1	0	29	2,213	0.72	0.860

PHF = Peak Hour Volume

Crash Severity

None of the crashes reported in the five-year analysis period resulted in a fatality but one of the crashes resulted in an incapacitating injury (Injury A):

- A fixed object collision reported at the intersection of SW Boones Ferry Road at SW Day Road resulted in one incapacitating injury (Injury A). The crash involved a single eastbound vehicle on a rainy day with the driver at fault for driving improperly.

Pedestrian Collisions

One of the reported crashes involved a pedestrian:

- A pedestrian walking southbound in the west crosswalk was reportedly struck by a northbound vehicle making a left turn onto SW Ibach Street. The pedestrian sustained possible injuries (Injury C) and the driver was reported at fault for failing to yield right of way to a pedestrian crossing in a marked crosswalk.

ODOT 90th Percentile Crash Rates

Intersection crash rates were compared to the published statewide 90th percentile crash rates within ODOT's Analysis Procedures Manual (APM). According to Exhibit 4-1: Intersection Crash Rates per MEV by Land Type and Traffic Control in the APM, intersections which experience crash rates in excess of 90th percentile crash rates should be "flagged for further analysis".

None of the intersections in the study area were calculated to have crash rates that exceed the 90th percentile crash rates for the intersection type.

ODOT Safety Priority Index System

According to the ODOT TransGIS website, none of the study area intersections were listed in the worst 15 percent of ODOT's 2019 Safety Priority Index System (SPIS) list.

Washington County Safety Priority Index System

One of the study area intersections is listed in the Washington County 2015-2017 SPIS List. The intersection of SW Boones Ferry Road & SW Day Road is ranked 323 of 365 based on 11 crashes over a three-year period. The crash analysis shows that most (65 percent) crashes were rear-end collisions and the severity was generally low.

Conclusion

Based on a review of the most recent five years of available crash data, no significant trends or crash patterns were identified at any of the study intersections. Accordingly, no safety mitigation is recommended per the crash data analysis.

Sight Distance

SW Norwood Road is under Washington County jurisdiction, so intersection sight distance (ISD) was measured and evaluated in accordance with Washington County Community Development Code (CDC) Section 501-8.5.F. Sight distance measurements were made from an entering driver's eye height of 3.5 feet above the roadway surface 15 feet behind the curb line/edge of pavement of the intersecting street to the position of an oncoming vehicle in the major-street traffic lane 4.25 feet above the roadway.

At the proposed site access on SW Norwood Road, the posted speed is 45 mph. Assuming a travel speed 5 mph over the posted speed results in an intersection sight distance requirement of 500 feet.

Due to foliage along the roadside, accurate sight distance measurements cannot be taken along the future roadway frontage. SW Norwood Road is straight and horizontal curvature is not anticipated to be an issue. The elevation profiles show that vertical curvature is unlikely to be an issue as well. Based on this preliminary assessment, the 500-foot sight distance requirement is expected to be satisfied at the proposed site access on SW Norwood Road.

Access Spacing

Site access will be taken from SW Norwood Road, which is under Washington County jurisdiction. The county access requirements are shown in CDC Section 501-8.5B. For SW Norwood Road with a collector classification, the access spacing standard is 100 feet measured between the edge of travel lanes or easements on both sides of the roadway.

One access on SW Norwood Road is proposed with the development. Measured consistently with the CDC, the access is planned approximately 540 feet east of SW Boones Ferry Road, 298 feet east of the existing driveway serving the Tualatin Hills Christian Church, and 376 feet west of an existing driveway serving the Horizon Christian School. There are no accesses on the north side of SW Norwood Road between SW Boones Ferry Road and SW 89th Avenue. Thus, the proposed site access will meet the Washington County access spacing standard of 100 feet as shown in the CDC Section 501-8.5B.

Left-Turn Lane Warrants

Left-turn lanes are not present on SW Norwood Road; therefore, left-turn lane warrants were examined at the proposed site access on SW Norwood Road using the methodology outlined in the National Cooperative Highway Research Program Report (NCHRP) 457, published by the Transportation Research Board in 2001. These turn-lane warrants are evaluated based on the number of left-turning vehicles, the number of advancing and opposing vehicles, and the roadway travel speed. The results are summarized in Table 6 for year 2026 conditions with full buildout of the proposed development, both with and without the Basalt Creek Parkway Extension. Detailed information on the warrant analysis is included in Appendix C.

Table 6: Summary of Left-Turn Lane Warrant Evaluation

Intersection & Scenario	Warrant Met?	
	Morning Peak	Evening Peak
3. Site Access & SW Norwood Road (westbound)		
2026 Buildout – No BCP Extension	No	No
2026 Buildout –With BCP Extension	No	No

BCP = Basalt Creek Parkway

As shown in Table 6, left-turn lane warrants are not met at the proposed site access intersection for either peak hour under the 2026 buildout scenario for any analysis period.

Traffic Signal Warrants

Preliminary Signal Warrants

Preliminary traffic signal warrants were examined at the unsignalized study area intersections to determine whether the installation of a new traffic signal will be warranted at these intersections upon completion of the proposed development.

At all three intersections, the speed assumed for the evaluation was 45 mph. The posted speed on SW Norwood Road is 45 mph. The posted speed on SW Boones Ferry Road changes from 45 mph south of the intersection with SW Norwood Road to 35 mph north of the intersection. A speed study conducted on SW Boones Ferry Road south of SW Norwood Road shows that the 85th percentile speed is 45 mph in both directions (see Appendix B). While drivers may be traveling slower north of the intersection, they are still likely to be traveling at a speed near 40 mph as they approach SW Norwood Road. Both the City of Tualatin and Washington County confirmed that using the 70 percent warrant thresholds for speeds of 40 mph or greater is appropriate.

The results are summarized in Table 7 for year 2026 conditions with full buildout of the proposed development, both with and without the Basalt Creek Parkway Extension. Detailed information on the warrant analysis is included in Appendix C.

Table 7: Summary of Preliminary Traffic Signal Warrant Evaluation

Intersection & Scenario	Warrant Met?	
	Based on Morning Peak	Based on Evening Peak
2. SW Boones Ferry Road & SW Norwood Road (Shared Lane – 50% Right-Turn Discount)		
2026 Buildout – No BCP Extension	Yes	Yes
2026 Buildout – With BCP Extension	Yes	Yes
2. SW Boones Ferry Road & SW Norwood Road (Separate Left- and Right-Turn Lanes)		
2026 Buildout – No BCP Extension	No	No
2026 Buildout – With BCP Extension	Yes	No
3. Site Access & SW Norwood Road		
2026 Buildout – No BCP Extension	No	No
2026 Buildout – With BCP Extension	No	No
4. SW 82nd Avenue & SW Norwood Road		
2026 Buildout – No BCP Extension	No	No
2026 Buildout – With BCP Extension	No	No

BCP = Basalt Creek Parkway

As shown in Table 7, preliminary traffic signal warrants are met at the SW Boones Ferry Road & SW Norwood Road intersection both with and without the Basalt Creek Parkway Extension with a shared westbound approach lane on SW Norwood Road. If separate left- and right-turn lanes are provided on SW Norwood Road, the preliminary warrant is met based on morning peak hour volumes. No warrants are met at the other two intersections evaluated.

Detailed Warrant Analysis

Since the preliminary warrants are met at the intersection of SW Boones Ferry Road & SW Norwood Road, a more detailed warrant analysis was conducted to better understand the circumstances that would warrant a traffic signal.

Using the 12-hour count as the basis of the evaluation, future volume forecasts were developed by growing the hourly volumes by 2 percent per year and adding the in-process traffic for the background condition and site-generated traffic for the buildout condition. The "Hourly Distribution of Entering and Exiting Vehicle Trips by Land Use" from the ITE *Trip Generation Manual* were used to estimate the hourly volumes for the in-process and site-generated trips based on the daily volume estimates. To account for the effects of the Basalt Creek Parkway Extension, through traffic volumes on SW Boones Ferry Road were increased by 5 percent in each direction.

The results of the detailed evaluation are summarized in Table 8 for two scenarios, one where a shared westbound approach lane is maintained and a second where a separate right-turn lane is added. As noted previously, at the request of City staff, land use code 220, *Multifamily (Low-Rise)*, was used rather than 221,

Multifamily (Mid-Rise), because it has higher trip rates and presents a more conservative assessment of project impacts. Detailed analyses are included in Appendix C.

Table 8: Detailed Signal Warrant Evaluation

Condition	Warrant Met?		
	8-Hour	4-Hour	Peak Hour
2. SW Boones Ferry Road & SW Norwood Road (Shared Lane – 50% Right-Turn Discount)			
2026 Background – No BCP Extension	Yes	Yes	Yes
2026 Background – With BCP Extension	Yes	Yes	Yes
2026 Buildout – No BCP Extension	Yes	Yes	Yes
2026 Buildout – With BCP Extension	Yes	Yes	Yes
2. SW Boones Ferry Road & SW Norwood Road (Separate Left- and Right-Turn Lanes)			
2026 Background – No BCP Extension	No	No	No
2026 Background – With BCP Extension	No	No	No
2026 Buildout – No BCP Extension	Yes	Yes	Yes
2026 Buildout – With BCP Extension	Yes	Yes	Yes

As shown in Table 8, with a shared westbound approach lane and a 50 percent right-turn discount to account for the ease of making right turns compared with left turns, all of the warrants are met under both background and buildout conditions with either land use category.

If a separate westbound right-turn lane is added, which requires acquiring right-of-way from the property on the north side of the street, the warrant results varied. The background condition would not meet any signal warrants but the buildout condition would meet the warrants with the conservative land use assumptions.[4]

Since the signal warrants are met for the buildout conditions with the shared westbound lane, a traffic signal is recommended as mitigation.

[4] Under these conditions, the assumption of land use category is shown to make a difference in the results. Using trip rates for low-rise apartments, as requested by the City, generates volumes that would meet the warrants while using trip rates for mid-rise apartments generates volumes that would not meet the warrants if a separate right-turn lane were to be provided.

Operational Analysis

The operations of the transportation were evaluated for the morning and evening peak hours for existing conditions and the future scenarios without and with the proposed development presented in this TIS.

Intersection Capacity Analysis

A capacity and delay analysis were conducted for each of the study intersections per the signalized and unsignalized intersection analysis methodologies in the *Highway Capacity Manual* (HCM)[5]. Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates very little, or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (v/c) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection.

The analysis was performed using the Synchro (version 11) software which applies the HCM6 methodologies to all study intersections.

Performance Standards

The following agency performance standards are applicable in the study area:

- The City of Tualatin requires intersections to operate at a minimum LOS D and LOS E for signalized and unsignalized intersections, respectively.
- Washington County has a mobility target of 0.90 but a v/c ratio of 0.99 or less is acceptable.

Assumptions for Basalt Creek Parkway Extension

The Basalt Creek Parkway Extension will create a new intersection along SW Boones Ferry Road. The geometry for the intersection and the traffic control were assumed to be the same as was used for the Opening Year Minimum Build 2023 scenario. Note, volumes differ because of additional background growth and in-process traffic from developments constructed after year 2023. The peak hour factor also differs based on more recent traffic counts.

Delay & Capacity Analysis

The LOS, delay, and v/c results of the capacity analysis are shown in Table 9 for the morning and evening peak hours and five scenarios. No changes to existing intersection configurations are assumed in this analysis except for those specifically associated with the Basalt Creek Parkway Extension project; recommended mitigation is discussed separately, after potential project impacts have been identified. Detailed calculations as well as tables showing the relationship between delay and LOS are included in Appendix D.

[5] Transportation Research Board, *Highway Capacity Manual 6th Edition*, 2016.

Table 9: Capacity Analysis Summary

Intersection & Scenario	Performance Standard	Morning Peak Hour			Evening Peak Hour		
		LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
1. SW Boones Ferry Road & SW Ibach Street/Court							
2022 Existing	LOS D	B	18	0.73	B	19	0.77
2026 Background		C	22	0.80	C	27	0.87
2026 Background w/ BCPE		C	22	0.81	B	19	0.80
2026 Buildout		C	22	0.81	C	29	0.89
2026 Buildout w/ BCPE		C	22	0.82	C	20	0.81
2. SW Boones Ferry Road & SW Norwood Road							
2022 Existing	0.99 LOS E	C	15	0.34	C	17	0.30
2026 Background		C	22	0.55	C	24	0.50
2026 Background w/ BCPE		D	28	0.62	C	24	0.50
2026 Buildout		D	34	0.75	E	38	0.70
2026 Buildout w/ BCPE		F	52	0.87	E	40	0.71
3. Site Access & SW Norwood Road							
2026 Buildout	0.99 LOS E	B	12	0.16	B	12	0.10
2026 Buildout w/ BCPE		B	12	0.16	B	12	0.10
4. SW 82nd Avenue & SW Norwood Road							
2022 Existing	0.99	B	12	0.10	B	11	0.06
2026 Background		B	13	0.13	B	11	0.08
2026 Background w/ BCPE		B	13	0.13	B	11	0.08
2026 Buildout		B	14	0.14	B	12	0.09
2026 Buildout w/ BCPE		B	14	0.14	B	12	0.09
5. SW Boones Ferry Road & Basalt Creek Parkway (future intersection)							
2026 Background w/ BCPE	0.99	C	21	0.78	C	28	0.89
2026 Buildout w/ BCPE		C	23	0.81	C	31	0.93
6. SW Boones Ferry Road & SW Day Road							
2022 Existing	0.99	C	31	0.49	C	34	0.60
2026 Background		C	31	0.58	C	34	0.67
2026 Background w/ BCPE		C	24	0.74	C	25	0.73
2026 Buildout		C	31	0.60	C	33	0.68
2026 Buildout w/ BCPE		C	24	0.74	C	24	0.75

BCPE = Basalt Creek Parkway Extension
Locations that do not meet standards are BOLDED.

In general, impacts from the proposed project are expected to be minor. All study intersections show operational results that meet standards under all analysis scenarios except for the intersection of SW Boones Ferry Road & SW Norwood Road. This intersection exceeds operational standards during the year 2026 buildout scenario with the Basalt Creek Parkway Extension in place during the morning peak hour.

To address these impacts, we recommend installing a traffic signal at the intersection of SW Boones Ferry Road & SW Norwood Road to mitigate the operational impacts of the project. The benefits of the recommended signal are described in the section of this report titled *Mitigation Analysis*.

Queuing Analysis

An analysis of projected queuing was conducted for the study intersections. The 95th percentile queue lengths were estimated based on the same Synchro/SimTraffic simulations used for the delay calculations. The 95th percentile queue is a statistical measurement which indicates there is a 5 percent chance that the queue may exceed this length during the analysis period; however, given this is a probability, the 95th percentile queue length may theoretically never be met or observed in the field.

No changes to existing intersection configurations are assumed in this analysis except for those specifically associated with the Basalt Creek Parkway Extension project; recommended mitigation is discussed separately, after potential project impacts have been identified. All queues more than 5 feet longer than a multiple of 25 were rounded up. Those that were 5 feet or less were rounded down since 5 feet is equivalent to the space between queued vehicles.

The 95th percentile queue lengths reported in the simulation are presented for the three concepts in Table 10 for the morning and evening peak hours. Detailed queuing analysis reports are included in Appendix D.

Table 10: Queuing Analysis Summary

Movement	Effective Storage (ft)	95th Percentile Queue Morning/Evening Peak Hour (ft)			
		2026 Background	2026 Background w/ BCPE	2026 Buildout	2026 Buildout w/BCPE
	1. SW Boones Ferry Road & SW Ibach Street/Court				
EBL	175	250/175	150/150	225/175	175/150
NBL	200	200/225	200/200	225/225	200/200
SBL	125	50/75	50/50	25/75	50/75
SBR	200	200/275	225/275	175/275	200/250
	2. SW Boones Ferry Road & SW Norwood Road				
WBLR	200	100/150	100/125	150/325	250/225
SBL	325	50/75	50/75	50/100	50/100
	3. Site Access & SW Norwood Road				
WBLT	330	-	-	0/25	25/25
NBLR	70	-	-	75/50	75/50

Table 10: Queuing Analysis Summary

Movement	Effective Storage (ft)	95th Percentile Queue Morning/Evening Peak Hour (ft)			
		2026 Background	2026 Background w/ BCPE	2026 Buildout	2026 Buildout w/BCPE
	4. SW 82nd Avenue & SW Norwood Road				
NB	100	50/50	50/50	50/50	50/50
SBLT	60	0/25	0/25	0/25	0/25
	5. SW Boones Ferry Road & Basalt Creek Parkway (future intersection)				
EBL	>1,000	-	75/125	-	75/125
EBR	>1,000	-	475/450	-	450/475
NBL	575	-	375/500	-	400/525
	6. SW Boones Ferry Road & SW Day Road				
EBLT	110	75/75	50/50	75/75	50/50
EBR	500	200/275	125/150	225/275	150/175
NBL	500	400/375	250/275	375/400	275/300

BCPE = Basalt Creek Parkway Extension
BOLDED results show projected queues which exceed current available storage

In general, changes in 95th percentile queuing between the year background and buildout conditions are anticipated to be small, one vehicle or two vehicles. One intersection is anticipated to have significant growth in queues: SW Boones Ferry Road & SW Norwood Road. Buildout conditions show queuing on the westbound approach fluctuates considerably from simulation to simulation but is sometimes expected to extend past the first driveway under build conditions.

To address these impacts, we recommend installing a traffic signal at the intersection of SW Boones Ferry Road & SW Norwood Road to mitigate the operational impacts of the project. The benefits of the recommended signal are described in the section of this report titled *Mitigation Analysis*.

Mitigation Analysis

The intersection of SW Boones Ferry Road & SW Norwood Road is expected to exceed mobility targets under one buildout scenario. Both the preliminary and detailed signal warrant analysis show that a signal is warranted at the intersection with a westbound shared-lane approach. The operational results and 95th percentile queues for the 2026 buildout condition with these mitigation options are summarized in Table 11. Detailed analysis and queuing reports are included in Appendix D.

Table 11: SW Boones Ferry Road & SW Norwood Road with Signal and No Widening

Measure	Condition/ Potential Improvement			
	2026 Buildout		2026 Buildout w/ BCPE[1]	
	Morning Peak	Evening Peak	Morning Peak	Evening Peak
Overall Intersection Operations				
v/c	0.63	0.64	0.68	0.64
LOS	B	B	B	B
Delay (s)	14	13	15	12
Operations on Westbound Approach				
v/c	0.72	0.74	0.68	0.66
LOS	C	C	C	C
Delay (s)	19	21	22	21
Movement (Storage[2])	**Condition/ Potential Improvement**			
	2026 Buildout		**2026 Buildout w/ BCPE[1]**	
	Morning Peak	**Evening Peak**	**Morning Peak**	**Evening Peak**
50th/95th Percentile Queues (ft)				
WBLR (200 ft)	75/150	75/125	75/150	75/125
NBT (100 ft)	150/225	175/275	150/250	150/275
NBR (85 ft)	25/100	50/150	25/100	50/150
SBL (325 ft)	50/100	100/150	50/75	75/125
SBT (230 ft)	75/125	100/200	75/150	125/225

Notes:

1. *BCPE = Basalt Creek Parkway Extension*
2. *Storage lengths reflect the distance to the closest driveway.*

BOLDED results show projected queues which exceed current available storage

Findings

The results of the operational analysis show that installing a traffic signal at the intersection, as warranted, will result in an overall intersection v/c ratio that would meet the City mobility standard of LOS D and the County mobility target of 0.90. On the westbound approach, delays will be shorter than background conditions without the project.

The queuing analysis with the recommended signal shows that the 95th percentile queues on the shared westbound approach will not extend to the first driveway on SW Norwood Road. Furthermore, analysis (see Appendix D) shows that with five years of additional growth, in 2031, westbound queues will still not extend to the first driveway on SW Norwood Road. These results support a conclusion a separate right-turn is not needed to accommodate the proposed development.

The queuing analysis shows that, when the intersection is signalized, the northbound queues in the through lane will sometimes block access to the northbound right-turn lane; however, the northbound right-turn is not necessary to meet operational thresholds. Queues for the northbound through lane will extend past the first driveway on the west side of SW Boones Ferry Road, which currently serves a single-family residence.

Recommendations

Based on these findings, a traffic signal is recommended at the intersection of SW Boones Ferry Road & SW Norwood Road but no additional travel lanes are needed to accommodate the proposed development. Therefore, widening SW Norwood Road to include a westbound right-turn lane or widening SW Boones Ferry Road to lengthen the northbound right-turn lane should not occur until the adjacent parcels redevelop.

Transportation Planning Rule

The Transportation Planning Rule (TPR) is in place to ensure that the transportation system can support possible increases in traffic intensity that could result from changes to adopted plans and land-use regulations.

The Norwood Apartments project proposes a zone change for a 9.2-acre parcel of land in Tualatin. The 9.2-acre site consists of Tax Lot 2S135D 000108, which is 1.0 acres and will be zoned Medium Low Density Residential (RML) upon annexation and 8.2 acres of Tax Lot 2S135D 000106, which is currently zone Institutional (IN). The site is proposed for rezoning to High Density/High Rise Residential (RH-HR).

The TPR requires an analysis of a reasonable worst-case development scenario of the site under existing and proposed zoning. If trip generation under the proposed zoning is greater than it would be under the existing zoning, then operational analysis is necessary to demonstrate that the change in zoning can be accommodated or mitigation will be necessary.

Trip Generation

The assumptions and potential development scenarios are described below.

Existing Zoning Assumptions

The Tualatin Development Code (TDC) describes allowed uses under RML zoning in Chapter 41 and the IN zoning in Chapter 49. In considering development scenarios for the TPR analysis, only permitted uses in the zone were considered.

Medium Low Density Residential (RML)

For Lot 108 with the RML zoning, residential development is the only permitted use that will generate significant traffic. TDC Table 41-3 describes the permitted densities for different types of residential development which range from 10 to 25 units per acre. For a reasonable worst-case analysis scenario, the site was assumed accommodate 25 townhomes, the maximum density that could be achieved.

Institutional (IN)

For Lot 106 with the IN zoning, allowed uses include assembly facilities (limited to places of religious worship), community services (limited to public facilities such as community recreation buildings or indoor aquatic centers), schools, and government offices. Allowed infrastructure uses include government-owned parks, sports fields, and tennis courts. Since the adjacent site to the west already includes a church and the remainder of the parcel will include a sanctuary/place of assembly, another church was not considered a reasonable option. Neither was a government office, which tend to be centrally located within a community. Although a community recreation center could be sited at this location, other nearby facilities make another recreation center at this location unlikely; therefore, a private school was selected for the reasonable worst-case analysis:

For a potential school use on the 8.2-acre site, the density of 31 students per acre from the annexation analysis was used. Based on this rate, a school accommodating approximately 250 students could be developed. For a reasonable worst-case analysis scenario, a private school offering kindergarten through 8th grade was assumed.

Proposed Zoning Assumptions

For the proposed RH-HR zoning, residential development is the only permitted use that will generate significant traffic. TDC Table 44-3 describes the permitted densities for different types of residential development. At the maximum density of 30 units/acre, the site could accommodate 276 apartments. Land use code 220, *Multifamily Housing (Low-Rise)* was used to estimate the reasonable worst case, which is consistent the proposed development.[6]

Trip Generation Comparison

To estimate trips that will be generated by the redevelopment, trip rates from the *Trip Generation Manual* were used based on the number of dwelling units (DU) or the number of students. The land use assumptions and trip generation estimates are summarized in Table 12.

Table 12: Trip Generation Comparison of Existing and Proposed Zoning

Option- Land Use (Code)	Intensity	Morning Peak Hour			Evening Peak Hour			Weekday Trips
		In	Out	Total	In	Out	Total	
Existing Zoning								
Lot 108 (1 Acre): RML Zoning (After Annexation)								
Single-Family Attached Housing (LUC 215)	25 DU	4	8	12	8	6	14	180
Lot 106 (8.2 Acres): IN Zoning								
Private School: K-8 (LUC 530)	250 Students	142	111	253	30	35	65	1,028
Combined Lots 106 & 108 (9.2 Acres) Worst Case								
Townhouses + K-8 School		146	119	265	38	41	79	1,208
Proposed Zoning								
Lots 106 & 108 (9.2 Acres): RH-HR Zoning								
Multifamily Housing: Low-Rise (221)	276 DU	26	82	108	88	51	139	1,844
Net Change with Proposed Zoning		-120	-37	-157	50	10	60	636

As shown in Table 12, the reasonable worst-case scenarios under the existing zoning would likely generate a greater number of trips during the morning peak hour, when congestion associated with schools is most prevalent. However, the proposed zoning could generate a greater number of trips in the evening peak hour. Therefore, a long-range assessment of peak hour conditions is needed for the TPR evaluation. Although the proposed zoning would only generate more traffic than existing zoning in the evening peak hour, the morning peak hour conditions were also evaluated.

[6] As explained in a prior footnote, the four-story project qualifies as ITE land use code is 221, *Multifamily Housing (Mid-Rise),* which includes trip rates that are generally lower during the evening peak and over the course of the day than those for land use code 220, *Multifamily Housing (Low-Rise).* Using the low-rise multifamily housing option provides a more conservative estimate of trip generation.

Future Traffic Volumes

For a TPR analysis, the forecasts should be based on "projected conditions measured at the end of the planning period identified in the adopted TSP." Although the current Tualatin TSP has a forecast year of 2035, it was amended to include the Basalt Creek Concept Plan, which has a forecast year of 2040. Therefore, the future year for the TPR analysis was assumed to be 2040.

To estimate future 2040 volumes, two sources of data were reviewed. One is the year 2040 regional travel demand model forecasts obtained from Washington County and Metro. The other was the "Washington County Basalt Creek Extension – Traffic Analysis Memorandum," dated January 16, 2020. After careful review of the various forecasts, a simple growth rate was used to estimate volumes in the study area.[7]

The long-term growth rates that best matched the future link forecasts from the other planning efforts were 0.5 percent per year for through traffic on SW Boones Ferry Road and 2.0 percent per year for all other movements. These growth rates were applied to the 2026 background condition volumes with the Basalt Creek Parkway Extension to estimate the 2040 existing zoning scenario.

The traffic generated by each zoning scenario was then added to the background growth to estimate the 2040 zoning scenario volumes. The resulting peak hour volumes are shown in Figure 10 for the existing zoning and Figure 11 for the proposed zoning.

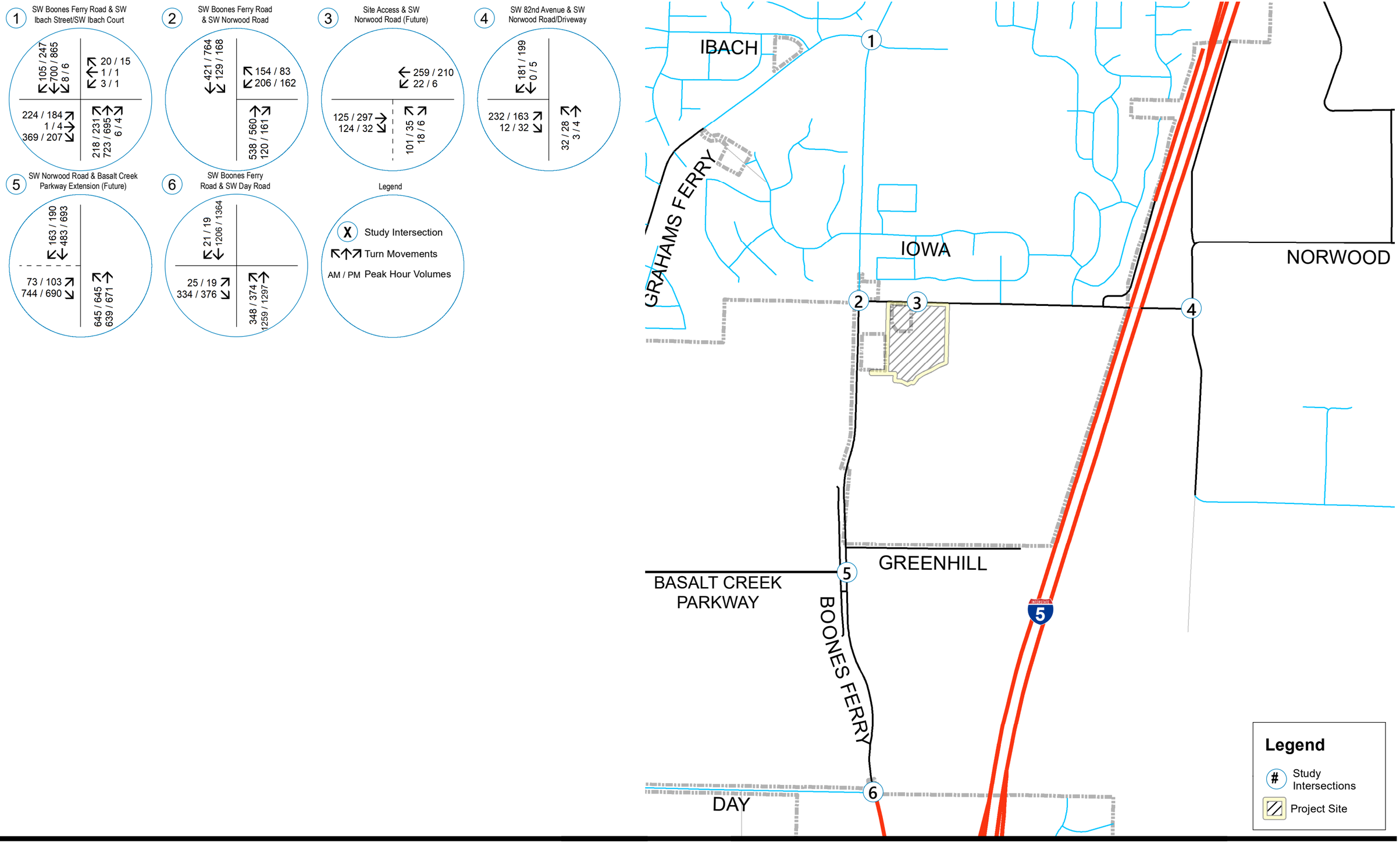
Operational Analysis

For the 2040 future operations, the following traffic control and lane configuration changes were assumed:

- The current lane configurations on SW Boones Ferry Road at the intersections with SW Norwood Road and SW Ibach Street were assumed. The TSP assumes that SW Boones Ferry Road will generally remain two to three lanes north of SW Norwood Road.
- The intersection of SW Boones Ferry Road & SW Norwood Road was assumed to be unsignalized since the adopted Tualatin TSP does not identify a signal at the intersection.
- To accommodate the long-term demand under the 2040 existing scenario, SW Boones Ferry Road was assumed to be widened to a five-lane section ending north of the Basalt Creek Parkway Extension. This assumption is consistent with the long-term build configuration presented in the January 16, 2020, memorandum for Basalt Creek Parkway Extension and the Washington County TSP. Specific intersection configurations are consistent with assumptions in these documents.

The resulting evening peak hour analysis for the 2040 existing zoning scenario and the 2040 proposed zoning scenario is summarized in Table 13.

[7] The growth rate method was selected because forecasting model-based methods were producing future volumes that were lower than 2026 buildout volumes for several critical movements in the study area.

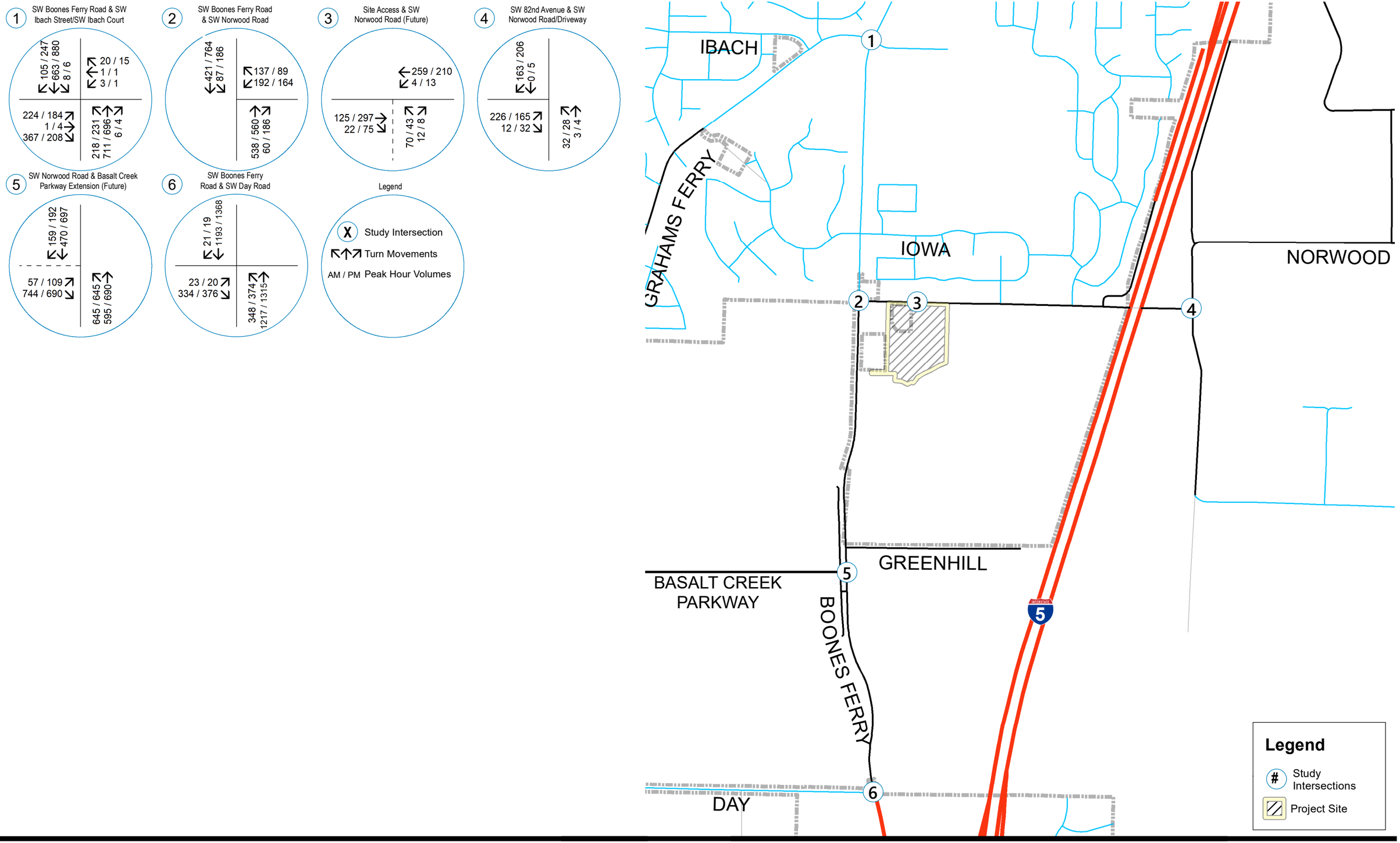


lancaster mobley

TRAFFIC VOLUMES
Year 2040 Existing Zoning Scenario

NOT TO SCALE

Figure 10
Norwood Apartments TIA
2/2/2023



lancaster mobley

TRAFFIC VOLUMES
Year 2040 Proposed Zoning Scenario

NOT TO SCALE

Figure 11
Norwood Apartments TIA
2/2/2023

Table 13: Year 2040 Peak Hour Capacity Analysis Summary

Intersection	Performance Standard	Morning Peak Hour			Evening Peak Hour		
		LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
1. SW Boones Ferry Road & SW Ibach Street/Court							
Existing Zoning	LOS D	C	34	0.83	C	29	0.90
Proposed Zoning		C	31	0.81	C	29	0.91
2. SW Boones Ferry Road & SW Norwood Road							
Existing Zoning	0.99 LOS E	F	100	1.07	F	72	0.91
Proposed Zoning		F	56	0.90	F	91	0.99
3. Site Access & SW Norwood Road							
Existing Zoning	0.99 LOSE	B	14	0.25	B	13	0.09
Proposed Zoning		B	12	0.15	B	14	0.12
4. SW 82nd Avenue & SW Norwood Road							
Existing Zoning	0.99	B	15	0.16	B	13	0.11
Proposed Zoning		B	15	0.15	B	13	0.11
5. S5\W Boones Ferry Road & Basalt Creek Parkway							
Existing Zoning	0.99	B	20	0.88	C	25	0.87
Proposed Zoning		B	19	0.88	C	25	0.87
6. SW Boones Ferry Road & SW Day Road							
Existing Zoning	0.99	B	18	0.78	B	18	0.84
Proposed Zoning		B	18	0.77	B	18	0.84

Locations that do not meet standards are BOLDED.

As shown in Table 13, changes in operations at all intersections will be the same or minimally better during the morning and the same or minimally worse during the evening with the proposed zoning. With either zoning scenario, all intersections will continue to meet agency standards except for intersection of SW Boones Ferry Road & SW Norwood Road. This intersection will operate at LOS F for under both the existing zoning and proposed zoning scenarios if it were to remain unsignalized. In the morning peak hour, conditions would be worse under existing zoning. In the evening peak hour, conditions would be worse with the proposed zoning.

Since the proposed zoning would worsen conditions during the evening peak hour, mitigation at the intersection of SW Boones Ferry Road & SW Norwood Road will be necessary. A traffic signal is proposed to mitigate the impact. As shown in Table 14, the signal would improve operations to meet standards.

Table 14: Year 2040 Peak Hour Capacity Analysis with Mitigation

Intersection	Performance Standard	Morning Peak Hour			Evening Peak Hour		
		LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
1. SW Boones Ferry Road & SW Norwood Road							
Existing Zoning	0.99 LOS D	B	18	0.71	B	14	0.69
Proposed Zoning		B	15	0.67	B	13	0.73

TPR Findings

The applicable elements of the TPR are each quoted directly in italics below, with responses following.

660-012-0060

(1) If an amendment to a functional plan, an acknowledged comprehensive plan, or a land use regulation (including a zoning map) would significantly affect an existing or planned transportation facility, then the local government must put in place measures as provided in section (2) of this rule, unless the amendment is allowed under section (3), (9) or (10) of this rule. A plan or land use regulation amendment significantly affects a transportation facility if it would:

(a) Change the functional classification of an existing or planned transportation facility (exclusive of correction of map errors in an adopted plan);

Response: Subsection (a) is not triggered because the functional classification of an existing or planned transportation facility is not changed by the proposal.

(b) Change standards implementing a functional classification system; or

Response: Subsection (b) is not triggered because the standards for implementing a functional classification system are not changed by the proposal.

(c) Result in any of the effects listed in paragraphs (A) through (C) of this subsection. If a local government is evaluating a performance standard based on projected levels of motor vehicle traffic, then the results must be based on projected conditions measured at the end of the planning period identified in the adopted TSP. As part of evaluating projected conditions, the amount of traffic projected to be generated within the area of the amendment may be reduced if the amendment includes an enforceable, ongoing requirement that would demonstrably limit traffic generation, including, but not limited to, transportation demand management. This reduction may diminish or completely eliminate the significant effect of the amendment.

(A) Types or levels of travel or access that are inconsistent with the functional classification of an existing or planned transportation facility;

(B) Degrade the performance of an existing or planned transportation facility such that it would not meet the performance standards identified in the TSP or comprehensive plan; or

(C) Degrade the performance of an existing or planned transportation facility that is otherwise projected to not meet the performance standards identified in the TSP or comprehensive plan.

Response: Subsection (c) would be triggered by the proposed zone change. The operational analysis with the proposed zoning would further degrade an intersection that would be performing below agency standards under existing zoning; the SW Boones Ferry Road & Norwood Road intersection, as summarized in Table 13. Therefore, the proposed zoning would have a significant effect. To address the effect, a traffic signal is proposed at the intersection of SW Boones Ferry Road & SW Norwood Road as mitigation. This proposal is consistent with the mitigation recommended to address the impacts of the proposed development in the TIA.

(2) If a local government determines that there would be a significant effect, then the local government must ensure that allowed land uses are consistent with the performance standards of the facility measured or projected at the end of the planning period identified in the adopted TSP through one or a combination of the remedies listed in subsections (a) through (e) below, unless the amendment meets the balancing test in subsection (e) or qualifies for partial mitigation in section (11) of this rule. A local government using subsection (e), section (3), section (10) or section (11) to approve an amendment recognizes that additional motor vehicle traffic congestion may result and that other facility providers would not be expected to provide additional capacity for motor vehicles in response to this congestion.

(a) Adopting measures that demonstrate allowed land uses are consistent with the performance standards of the transportation facility.

Response: This action is not recommended.

(b) Amending the TSP or comprehensive plan to provide transportation facilities, improvements, or services adequate to support the proposed land uses consistent with the requirements of this division. Such amendments shall include a funding plan or mechanism consistent with section (4) or include an amendment to the transportation finance plan so that the facility, improvement, or service will be provided by the end of the planning period.

Response: The City of Tualatin has indicated that they will be adding a traffic signal at the intersection of SW Boones Ferry Road & SW Norwood Road as an element of the TSP. The addition is anticipated to occur with an update to the TSP scheduled for adoption in 2024. Funding of this improvement is anticipated to come from Transportation System Development Charges. However, this future amendment of the TSP is not relied upon in this application to comply with the TPR. Instead, a traffic signal will be installed at the intersection of SW Boones Ferry Road & SW Norwood Road at the time of development as mitigation, as provided in OAR 660-12-0660(2)(d).

(c) Amending the TSP to modify the performance standards of the transportation facility.

Response: This action is not recommended.

(d) Providing other measures as a condition of development or through a development agreement or similar funding method, including, but not limited to, transportation system management measures or minor transportation improvements. Local governments shall, as part of the amendment, specify when measures or improvements provided pursuant to this subsection will be provided.

Response: A condition of approval that requires the installation of a traffic signal at the intersection of SW Boones Ferry Road & SW Norwood Road at the time of development will mitigate the impact of the rezone , and as shown in Table 14, the intersection will be consistent with performance standards at the end of the planning period.

(e) *Providing improvements that would benefit modes other than the significantly affected mode, improvements to facilities other than the significantly affected facility, or improvements at other locations, if:*

(A) *The provider of the significantly affected facility provides a written statement that the system-wide benefits are sufficient to balance the significant effect, even though the improvements would not result in consistency for all performance standards;*

(B) *The providers of facilities being improved at other locations provide written statements of approval; and*

(C) *The local jurisdictions where facilities are being improved provide written statements of approval.*

Response: This action is not recommended.

Conclusion

Based on this comparison of reasonable worst case trip generation, the proposed zoning would have a significant effect that can be mitigated with a traffic signal at the intersection of SW Boones Ferry Road & SW Norwood Road. Accordingly, we recommend a condition of approval requiring installation of a traffic signal at SW Boones Ferry Road & SW Norwood Road at the time of development. This proposal is consistent with the mitigation recommended to address the impacts of the proposed development in the TIA.

Conclusions

Proposed Zone Change Findings

- To understand the potential impacts of the requested zone change, the reasonable worst-case land uses under existing and proposed zoning were compared. Under existing zoning, the residentially-zoned land was assumed to redevelop to its maximum density with 25 attached homes while the institutionally-zoned land was assumed to develop with a 250-student private school. The proposed development of 276 apartments is the maximum density under the proposed zoning.
- The existing zoning would likely generate a greater number of trips during the morning peak hour, when congestion associated with schools is most prevalent. However, the proposed zoning could generate a greater number of trips in the evening peak hour; thus, a TPR analysis was performed.
- A comparison of long-term operations with the existing and proposed zoning shows that the proposed zoning would have a significant effect that can be mitigated with a traffic signal at the intersection of SW Boones Ferry Road & SW Norwood Road, to be installed by the applicant at the time of development. This proposal is consistent with the mitigation recommended to address the impacts of the proposed development in the TIA.

Traffic Impact Analysis Findings

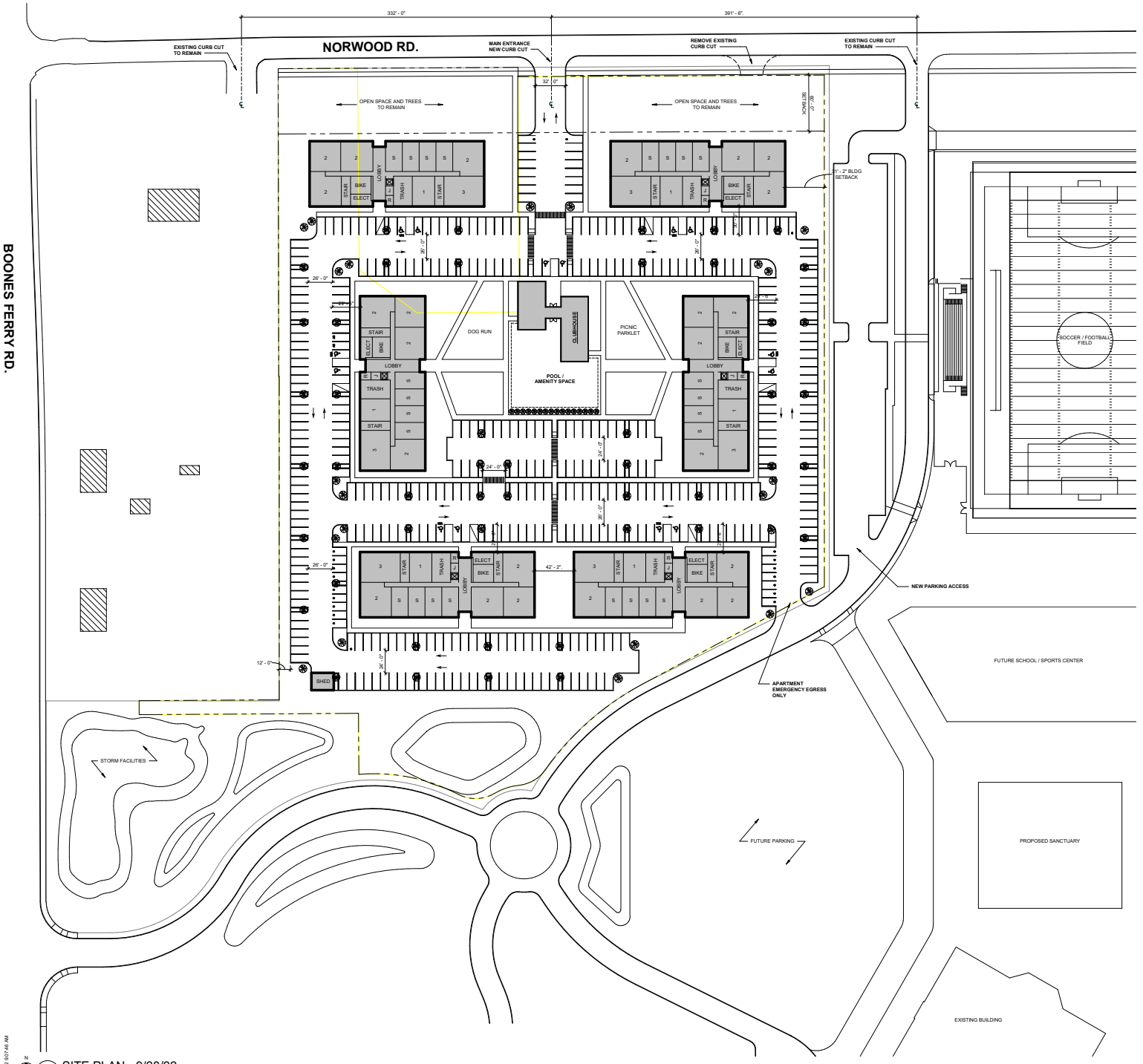
- The Norwood Apartments project could be characterized as two different land use categories, low-rise multifamily housing or mid-rise multifamily. This analysis uses the more conservative (e.g., assumes a higher level of traffic) land use category, low-rise multifamily housing, as requested by the City of Tualatin. The trip generation calculations show that the proposed Norwood Apartments development is estimated to generate a net increase of 107 trips during the morning peak hour, 137 trips during the evening peak hour, and 1,826 daily trips during the average weekday.
- In general, impacts from the proposed project are expected to be minor. All study intersections show operational results that meet standards under all analysis scenarios except for the intersection of SW Boones Ferry Road & SW Norwood Road if it remains unsignalized. However, with the recommended signal installation, this intersection will be improved to meet agency standards.
- In general, changes in 95th percentile queuing between the year background and buildout conditions are anticipated to be small, one vehicle or two vehicles. As with the operational findings, one intersection is anticipated to have significant growth in queues: SW Boones Ferry Road & SW Norwood Road. However, with the recommended signal installation, queueing will be consistently improved.
- A traffic signal is recommended at the intersection of SW Boones Ferry Road & SW Norwood Road. With a signal but no widening on SW Norwood Road, the overall intersection v/c ratio will meet the City mobility standard of LOS D and the County mobility target of 0.90. On the westbound approach, delays will be shorter than background conditions without the proposed project and recommended traffic signal. The queuing analysis shows that even with five years of additional growth, the 95th percentile queues on the shared westbound approach will not extend to the first driveway on SW Norwood Road. Therefore, widening SW Norwood Road to include a westbound right-turn lane or widening SW Boones Ferry Road to lengthen the northbound right-turn lane should not occur until the adjacent parcels redevelop.

- Traffic signal warrants are met under both background and buildout conditions at the intersection of SW Boones Ferry Road & SW Norwood Road. Installing a traffic signal at the intersection of SW Boones Ferry Road & SW Norwood Road is a recommended mitigation measure.
- Traffic signal warrants are not met at the site access intersection with SW Norwood Road or at the unsignalized intersection of SW Norwood Road & SW 82nd Avenue.
- Left-turn lane warrants are not met at the proposed site access intersection on SW Norwood Road for either peak hour under the 2026 buildout scenario for any analysis period.
- At the proposed site accesses on SW Norwood Road, dense foliage restricts existing sight lines; however, preliminary assessment or horizontal and vertical curvature indicate that the 500-foot sight distance requirement is expected to be satisfied.
- On SW Norwood Road, the minimum access spacing standard of 100 feet will be met with construction of the proposed site access.
- Based on a review of the most recent five years of available crash data, no significant trends or crash patterns were identified at any of the study intersections. Accordingly, no safety mitigation is recommended per the crash data analysis.

Appendix A – Site Information

Site Plan

Trip Generation Calculations



1 SITE PLAN - 9/28/22
SCALE: 1" = 40'-0"

9/28/2022 9:07:46 AM

PROGRAM SUMMARY

9.2 ACRE SITE

(6) 4-STORY RESIDENTIAL BUILDINGS
TOTAL UNITS =276 (30 DU/ACRE)
TOTAL GSF = APPROX. 314,072

See preliminary plans to be submitted with the Architectural Review application for additional detail.

LSW ARCHITECTS
LSW Architects, PC
610 Esther St., Suite 200
Vancouver, WA 98660
360.694.8571
LSW-Architects.com

preliminary

drawn by
Author
checked by
Checker

lsw job number
2022-0020

NORWOOD APARTMENTS
VISTA RESIDENTIAL PARTNERS
Tualatin, OR

issue date
Issue Date
Project Status
revisions

SITE PLAN

A-004

Scale 1" = 40'-0"

TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition

Land Use:	Single-Family Detached Housing
Land Use Code:	210
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Trip Type:	Vehicle
Formula Type:	Rate
Variable Quantity:	2

WARNING: Variable Quantity is less than Minimum Survey Size for Peak Hours

AM PEAK HOUR

Trip Rate: 0.7

	Enter	Exit	Total
Directional Split	26%	74%	
Trip Ends	0	1	1

PM PEAK HOUR

Trip Rate: 0.94

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	1	1	2

WEEKDAY

Trip Rate: 9.43

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	9	9	18

SATURDAY

Trip Rate: 9.48

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	9	9	18

Proposed Development Trips

TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition

Land Use:	Multifamily Housing (Low-Rise)
Land Use Code:	220
Land Use Subcategory:	Not Close to Rail Transit
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Trip Type:	Vehicle
Formula Type:	Equation
Variable Quantity:	276

AM PEAK HOUR

Trip Rate: =0.31*($X5)+22.85

	Enter	Exit	Total
Directional Split	24%	76%	
Trip Ends	26	82	108

PM PEAK HOUR

Trip Rate: =0.43*($X5)+20.55

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	88	51	139

WEEKDAY

Trip Rate: =6.41*($X5)+75.31

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	922	922	1,844

SATURDAY

Trip Rate: =4.55*($X5)

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	628	628	1,256

Caution: Small Sample Size

TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition

Land Use:	Single-Family Attached Housing
Land Use Code:	215
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Trip Type:	Vehicle
Formula Type:	Rate
Variable Quantity:	25

AM PEAK HOUR

Trip Rate: 0.48

	Enter	Exit	Total
Directional Split	31%	69%	
Trip Ends	4	8	12

PM PEAK HOUR

Trip Rate: 0.57

	Enter	Exit	Total
Directional Split	57%	43%	
Trip Ends	8	6	14

WEEKDAY

Trip Rate: 7.2

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	90	90	180

SATURDAY

Trip Rate: 8.76

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	110	110	220

TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition

Land Use:	Private School (K-8)
Land Use Code:	530
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	Students
Trip Type:	Vehicle
Variable Quantity:	250

AM PEAK HOUR

Trip Rate: 1.01

	Enter	Exit	Total
Directional Split	56%	44%	
Trip Ends	142	111	253

PM PEAK HOUR

Trip Rate: 0.26

	Enter	Exit	Total
Directional Split	46%	54%	
Trip Ends	30	35	65

WEEKDAY

Trip Rate: 4.11

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	514	514	1,028

Caution: Small Sample Size

AFTERNOON PEAK HOUR

Trip Rate: 0.6

	Enter	Exit	Total
Directional Split	47%	53%	
Trip Ends	71	79	150

TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition

Land Use:	Multifamily Housing (Low-Rise)
Land Use Code:	220
Land Use Subcategory:	Not Close to Rail Transit
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Trip Type:	Vehicle
Formula Type:	Equation
Variable Quantity:	276

AM PEAK HOUR

Trip Rate: =0.31*($X5)+22.85

	Enter	Exit	Total
Directional Split	24%	76%	
Trip Ends	26	82	108

PM PEAK HOUR

Trip Rate: =0.43*($X5)+20.55

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	88	51	139

WEEKDAY

Trip Rate: =6.41*($X5)+75.31

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	922	922	1,844

SATURDAY

Trip Rate: =4.55*($X5)

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	628	628	1,256

Caution: Small Sample Size

Appendix B – Volumes

Traffic Counts

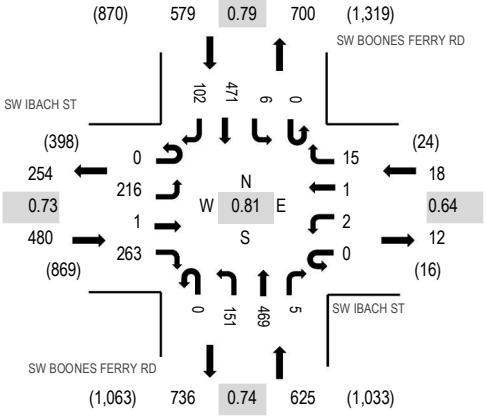
In-Process Trips

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

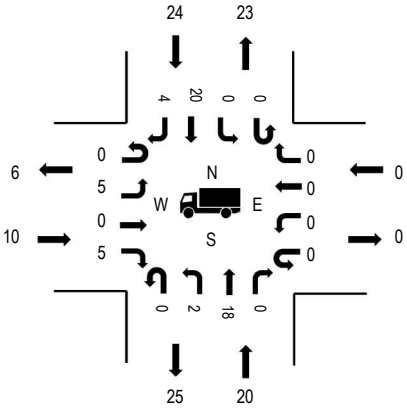
Location: 1 SW BOONES FERRY RD & SW IBACH ST AM
Date: Thursday, October 20, 2022
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:45 AM - 09:00 AM

Peak Hour

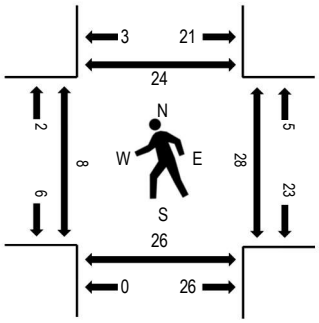
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.1%	0.73
WB	0.0%	0.64
NB	3.2%	0.74
SB	4.1%	0.79
All	3.2%	0.81

Traffic Counts - Motorized Vehicles

Interval Start Time	SW IBACH ST Eastbound				SW IBACH ST Westbound				SW BOONES FERRY RD Northbound				SW BOONES FERRY RD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	12	0	3	0	0	0	1	0	3	19	0	0	0	11	3	52	1,094
7:05 AM	0	14	0	4	0	0	0	0	0	9	32	1	0	0	13	5	78	1,172
7:10 AM	0	15	0	7	0	0	0	0	0	3	21	0	0	0	11	2	59	1,196
7:15 AM	0	26	0	6	0	0	0	1	0	5	18	0	0	0	15	2	73	1,243
7:20 AM	0	15	0	3	0	0	0	1	0	6	25	0	0	0	12	9	71	1,291
7:25 AM	0	23	0	9	0	0	0	0	0	6	20	0	0	0	19	3	80	1,352
7:30 AM	0	28	0	5	0	0	0	1	0	5	28	0	0	0	14	4	85	1,399
7:35 AM	0	19	1	14	0	0	0	2	0	5	29	1	0	0	19	7	97	1,448
7:40 AM	0	30	0	12	0	0	0	0	0	5	30	0	0	0	34	8	119	1,511
7:45 AM	0	25	0	9	0	0	0	0	0	10	38	0	0	0	27	7	116	1,559
7:50 AM	0	38	0	21	0	0	0	0	0	6	46	0	0	1	20	10	142	1,631
7:55 AM	0	33	0	17	0	0	0	0	0	8	29	0	0	0	22	13	122	1,655
8:00 AM	0	24	0	12	0	0	0	1	0	11	41	0	0	0	32	9	130	1,702
8:05 AM	0	24	0	7	0	0	1	0	0	5	28	0	0	0	24	13	102	
8:10 AM	0	19	0	13	0	0	0	0	0	11	29	0	0	0	26	8	106	
8:15 AM	0	27	0	14	0	0	0	2	0	6	18	0	0	1	41	12	121	
8:20 AM	0	30	0	12	0	0	0	3	0	10	40	3	0	0	25	9	132	
8:25 AM	0	14	0	14	0	1	0	0	0	12	43	2	0	0	34	7	127	
8:30 AM	0	12	0	17	0	1	0	2	0	16	34	0	0	2	44	6	134	
8:35 AM	0	20	0	41	0	0	0	2	0	13	34	0	0	0	42	8	160	
8:40 AM	0	11	0	46	0	0	0	0	0	15	42	0	0	1	47	5	167	
8:45 AM	0	16	0	48	0	0	0	2	0	17	49	0	0	0	43	13	188	
8:50 AM	0	11	0	24	0	0	0	1	0	18	58	0	0	0	51	3	166	
8:55 AM	0	8	1	15	0	0	0	2	0	17	53	0	0	2	62	9	169	
Count Total	0	494	2	373	0	2	1	21	0	222	804	7	0	7	688	175	2,796	
Peak Hour	0	216	1	263	0	2	1	15	0	151	469	5	0	6	471	102	1,702	

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
7:00 AM	1	0	0	0	1	7:00 AM	0	0	0	0	0	7:00 AM	0	0	1	0	1
7:05 AM	1	1	0	1	3	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	2	0	1	3	7:10 AM	1	0	0	0	1	7:10 AM	0	0	0	0	0
7:15 AM	0	0	1	1	2	7:15 AM	0	0	0	1	1	7:15 AM	0	0	0	0	0
7:20 AM	0	2	0	1	3	7:20 AM	0	0	0	0	0	7:20 AM	0	0	1	0	1
7:25 AM	1	0	0	1	2	7:25 AM	0	0	0	0	0	7:25 AM	1	0	0	0	1
7:30 AM	0	0	0	1	1	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	1	2	0	1	4	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	1	0	0	4	5	7:40 AM	0	0	0	0	0	7:40 AM	0	0	1	2	3
7:45 AM	0	0	0	2	2	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	1	1
7:50 AM	0	0	0	1	1	7:50 AM	0	0	1	0	1	7:50 AM	0	0	0	0	0
7:55 AM	1	2	0	2	5	7:55 AM	0	0	0	0	0	7:55 AM	0	0	1	1	2
8:00 AM	2	1	0	1	4	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	1	1
8:05 AM	0	2	0	0	2	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	1	2	0	1	4	8:10 AM	0	0	0	1	1	8:10 AM	0	0	2	1	3
8:15 AM	0	0	0	1	1	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	1	1
8:20 AM	0	0	0	1	1	8:20 AM	0	0	0	0	0	8:20 AM	2	1	0	0	3
8:25 AM	3	1	0	3	7	8:25 AM	0	0	0	1	1	8:25 AM	0	3	1	0	4
8:30 AM	0	4	0	3	7	8:30 AM	0	0	0	0	0	8:30 AM	2	6	2	0	10
8:35 AM	2	2	0	2	6	8:35 AM	0	0	0	0	0	8:35 AM	2	6	4	5	17
8:40 AM	2	2	0	4	8	8:40 AM	0	0	0	0	0	8:40 AM	0	3	13	12	28
8:45 AM	0	3	0	3	6	8:45 AM	0	0	0	1	1	8:45 AM	2	6	3	2	13
8:50 AM	0	2	0	3	5	8:50 AM	0	0	0	1	1	8:50 AM	0	1	3	3	7
8:55 AM	0	1	0	2	3	8:55 AM	0	0	0	1	1	8:55 AM	0	0	1	0	1
Count Total	16	29	1	40	86	Count Total	1	0	1	6	8	Count Total	9	26	33	29	97
Peak Hour	10	20	0	24	54	Peak Hour	0	0	0	5	5	Peak Hour	8	26	29	25	88

ALL TRAFFIC DATA SERVICES
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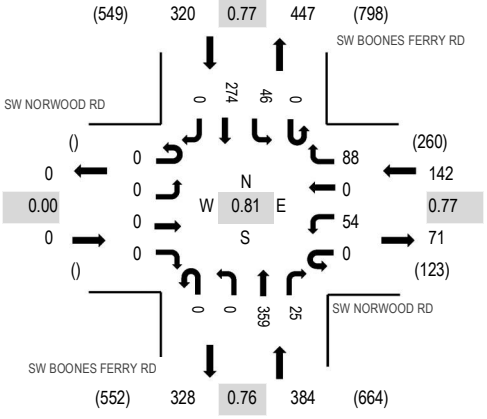
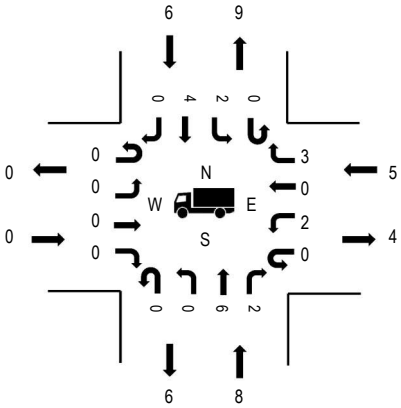
Location: 2 SW BOONES FERRY RD & SW NORWOOD RD AM
Date: Thursday, October 20, 2022
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour

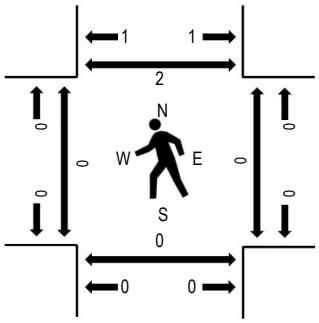
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.00
WB	3.5%	0.77
NB	2.1%	0.76
SB	1.9%	0.77
All	2.2%	0.81

Traffic Counts - Motorized Vehicles

Interval Start Time	SW NORWOOD RD Eastbound				SW NORWOOD RD Westbound				SW BOONES FERRY RD Northbound				SW BOONES FERRY RD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	0	0	0	0	1	0	3	0	0	15	2	0	0	9	0	30	697
7:05 AM	0	0	0	0	0	4	0	5	0	0	18	2	0	4	11	0	44	741
7:10 AM	0	0	0	0	0	1	0	1	0	0	17	2	0	4	9	0	34	761
7:15 AM	0	0	0	0	0	0	0	3	0	0	17	3	0	1	23	0	47	785
7:20 AM	0	0	0	0	0	3	0	0	0	0	20	0	0	0	15	0	38	805
7:25 AM	0	0	0	0	0	1	0	8	0	0	26	0	0	0	16	0	51	843
7:30 AM	0	0	0	0	0	5	0	5	0	0	26	0	0	4	16	0	56	846
7:35 AM	0	0	0	0	0	3	0	4	0	0	23	0	0	4	28	0	62	842
7:40 AM	0	0	0	0	0	4	0	6	0	0	27	2	0	4	32	0	75	834
7:45 AM	0	0	0	0	0	4	0	11	0	0	40	2	0	3	31	0	91	820
7:50 AM	0	0	0	0	0	7	0	3	0	0	39	2	0	5	29	0	85	809
7:55 AM	0	0	0	0	0	4	0	10	0	0	38	6	0	2	24	0	84	796
8:00 AM	0	0	0	0	0	4	0	9	0	0	37	2	0	2	20	0	74	776
8:05 AM	0	0	0	0	0	7	0	7	0	0	25	1	0	4	20	0	64	
8:10 AM	0	0	0	0	0	4	0	8	0	0	26	0	0	5	15	0	58	
8:15 AM	0	0	0	0	0	5	0	5	0	0	17	4	0	8	28	0	67	
8:20 AM	0	0	0	0	0	6	0	11	0	0	33	6	0	3	17	0	76	
8:25 AM	0	0	0	0	0	1	0	9	0	0	28	0	0	2	14	0	54	
8:30 AM	0	0	0	0	0	2	0	10	0	0	21	1	0	3	15	0	52	
8:35 AM	0	0	0	0	0	2	0	8	0	0	19	5	0	3	17	0	54	
8:40 AM	0	0	0	0	0	3	0	9	0	0	27	2	0	3	17	0	61	
8:45 AM	0	0	0	0	0	2	0	17	0	0	27	2	0	4	28	0	80	
8:50 AM	0	0	0	0	0	1	0	22	0	0	25	4	0	4	16	0	72	
8:55 AM	0	0	0	0	0	4	0	8	0	0	25	0	0	3	24	0	64	
Count Total	0	0	0	0	0	78	0	182	0	0	616	48	0	75	474	0	1,473	
Peak Hour	0	0	0	0	0	54	0	88	0	0	359	25	0	46	274	0	846	

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
7:00 AM	0	1	0	0	1	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	0	1	1	0	2	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	1	0	0	1	7:10 AM	0	0	0	1	1	7:10 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	1	1	7:15 AM	0	0	0	0	0
7:20 AM	0	1	0	1	2	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	0	1	1	2	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	0	1	0	1	2	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	1	1
7:40 AM	0	1	0	1	2	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	1	1
7:45 AM	0	0	0	1	1	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	0	2	1	1	4	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	0	1	0	0	1	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	0	2	0	0	2	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	0	1	2	1	4	8:10 AM	0	0	0	1	1	8:10 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	0	1	1	2	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	0	1	0	1	8:25 AM	0	0	0	1	1	8:25 AM	0	0	0	0	0
8:30 AM	0	1	0	1	2	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	1	1	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	0	0	1	2	3	8:45 AM	0	0	0	1	1	8:45 AM	0	0	0	0	0
8:50 AM	0	0	1	0	1	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	2	2	8:55 AM	0	0	0	0	0	8:55 AM	0	0	1	0	1
Count Total	0	13	9	14	36	Count Total	0	0	0	5	5	Count Total	0	0	1	2	3
Peak Hour	0	8	5	6	19	Peak Hour	0	0	0	2	2	Peak Hour	0	0	0	2	2

ALL TRAFFIC DATA SERVICES
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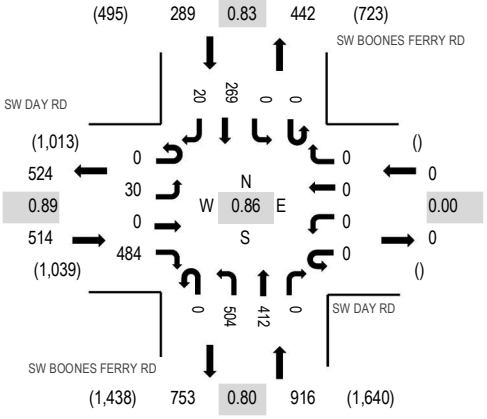
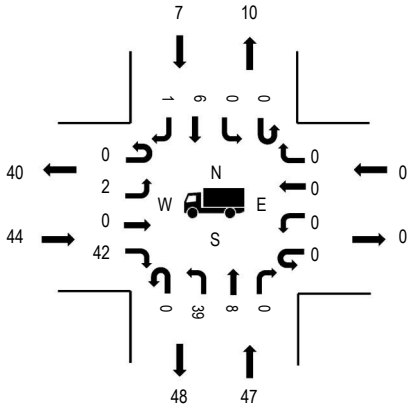
Location: 3 SW BOONES FERRY RD & SW DAY RD AM
Date: Thursday, October 20, 2022
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour

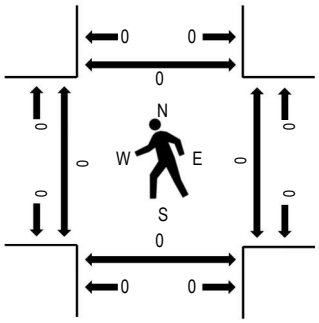
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	8.6%	0.89
WB	0.0%	0.00
NB	5.1%	0.80
SB	2.4%	0.83
All	5.7%	0.86

Traffic Counts - Motorized Vehicles

Interval Start Time	SW DAY RD Eastbound				SW DAY RD Westbound				SW BOONES FERRY RD Northbound				SW BOONES FERRY RD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	1	0	30	0	0	0	0	0	39	24	0	0	0	12	1	107	1,638
7:05 AM	0	1	0	46	0	0	0	0	0	47	18	0	0	0	11	1	124	1,676
7:10 AM	0	2	0	40	0	0	0	0	0	37	14	0	0	0	10	1	104	1,685
7:15 AM	0	2	0	46	0	0	0	0	0	50	19	0	0	0	18	1	136	1,715
7:20 AM	0	0	0	33	0	0	0	0	0	46	25	0	0	0	19	2	125	1,702
7:25 AM	0	1	0	40	0	0	0	0	0	46	19	0	0	0	12	2	120	1,703
7:30 AM	0	3	0	38	0	0	0	0	0	47	33	0	0	0	17	1	139	1,719
7:35 AM	0	3	0	41	0	0	0	0	0	45	24	0	0	0	23	1	137	1,700
7:40 AM	0	0	0	31	0	0	0	0	0	51	35	0	0	0	26	2	145	1,690
7:45 AM	0	7	0	47	0	0	0	0	0	37	54	0	0	0	25	1	171	1,669
7:50 AM	0	9	0	39	0	0	0	0	0	46	49	0	0	0	30	3	176	1,642
7:55 AM	0	3	0	32	0	0	0	0	0	56	46	0	0	0	14	3	154	1,584
8:00 AM	0	0	0	47	0	0	0	0	0	40	27	0	0	0	29	2	145	1,536
8:05 AM	0	3	0	33	0	0	0	0	0	39	29	0	0	0	26	3	133	
8:10 AM	0	2	0	43	0	0	0	0	0	38	26	0	0	0	24	1	134	
8:15 AM	0	0	0	50	0	0	0	0	0	33	26	0	0	0	12	2	123	
8:20 AM	0	0	0	36	0	0	0	0	0	37	28	0	0	0	25	0	126	
8:25 AM	0	0	0	47	0	0	0	0	0	35	35	0	0	0	18	1	136	
8:30 AM	0	3	0	41	0	0	0	0	0	40	17	0	0	0	18	1	120	
8:35 AM	0	5	0	46	0	0	0	0	0	35	18	0	0	0	20	3	127	
8:40 AM	0	4	0	43	0	0	0	0	0	33	27	0	0	0	15	2	124	
8:45 AM	0	6	0	48	0	0	0	0	0	38	29	0	0	0	19	4	144	
8:50 AM	0	0	0	49	0	0	0	0	0	35	21	0	0	0	13	0	118	
8:55 AM	0	2	0	36	0	0	0	0	0	24	23	0	0	0	20	1	106	
Count Total	0	57	0	982	0	0	0	0	0	974	666	0	0	0	456	39	3,174	
Peak Hour	0	30	0	484	0	0	0	0	0	504	412	0	0	0	269	20	1,719	

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
7:00 AM	6	2	0	0	8	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	6	6	0	1	13	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	8	6	0	0	14	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	6	2	0	0	8	7:15 AM	0	0	0	0	0	7:15 AM	1	0	0	0	1
7:20 AM	4	7	0	1	12	7:20 AM	0	0	0	1	1	7:20 AM	0	0	0	0	0
7:25 AM	0	3	0	2	5	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	3	5	0	1	9	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	5	1	0	0	6	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	3	3	0	1	7	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	3	3	0	1	7	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	5	5	0	0	10	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	1	6	0	1	8	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	3	3	0	1	7	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	3	7	0	0	10	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	3	3	0	1	7	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	2	4	0	0	6	8:15 AM	0	0	0	1	1	8:15 AM	0	0	0	0	0
8:20 AM	9	5	0	0	14	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	4	2	0	1	7	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	3	5	0	2	10	8:30 AM	0	0	0	1	1	8:30 AM	0	0	0	0	0
8:35 AM	3	5	0	0	8	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	3	3	0	0	6	8:40 AM	0	0	0	1	1	8:40 AM	0	0	0	0	0
8:45 AM	3	7	0	0	10	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	4	3	0	0	7	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	7	4	0	2	13	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	97	100	0	15	212	Count Total	0	0	0	4	4	Count Total	1	0	0	0	1
Peak Hour	44	47	0	7	98	Peak Hour	0	0	0	1	1	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
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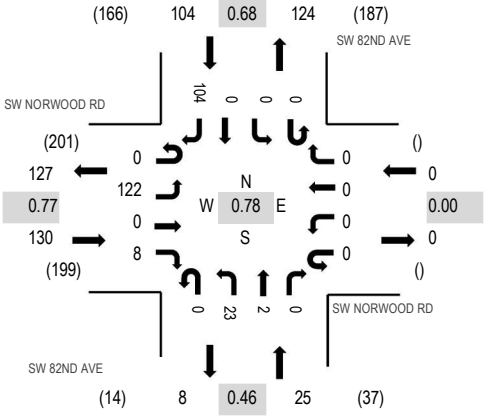
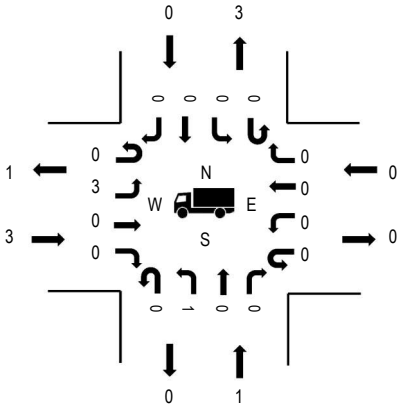
Location: 4 SW 82ND AVE & SW NORWOOD RD AM
Date: Thursday, October 20, 2022
Peak Hour: 07:40 AM - 08:40 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour

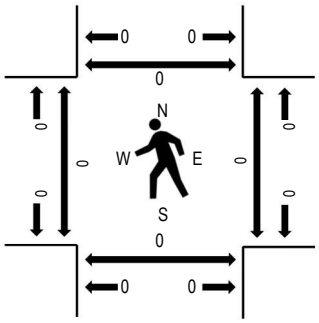
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.3%	0.77
WB	0.0%	0.00
NB	4.0%	0.46
SB	0.0%	0.68
All	1.5%	0.78

Traffic Counts - Motorized Vehicles

Interval Start Time	SW NORWOOD RD Eastbound				SW NORWOOD RD Westbound				SW 82ND AVE Northbound				SW 82ND AVE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	4	183
7:05 AM	0	8	0	2	0	0	0	0	0	1	0	0	0	0	0	1	12	194
7:10 AM	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	3	10	203
7:15 AM	0	2	0	1	0	0	0	0	0	2	0	0	0	0	0	1	6	212
7:20 AM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4	8	226
7:25 AM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	4	6	240
7:30 AM	0	8	0	1	0	0	0	0	0	1	0	0	0	0	0	5	15	253
7:35 AM	0	12	0	0	0	0	0	0	0	1	0	0	0	0	0	4	17	257
7:40 AM	0	13	0	1	0	0	0	0	0	0	0	0	0	0	0	8	22	259
7:45 AM	0	10	0	0	0	0	0	0	0	6	0	0	0	0	0	10	26	257
7:50 AM	0	17	0	1	0	0	0	0	0	5	0	0	0	0	0	8	31	259
7:55 AM	0	16	0	1	0	0	0	0	0	3	0	0	0	0	0	6	26	239
8:00 AM	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	7	15	219
8:05 AM	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	10	21	
8:10 AM	0	7	0	2	0	0	0	0	0	0	0	0	0	0	0	10	19	
8:15 AM	0	10	0	1	0	0	0	0	0	1	1	0	0	0	0	7	20	
8:20 AM	0	11	0	0	0	0	0	0	0	3	0	0	0	0	0	8	22	
8:25 AM	0	7	0	1	0	0	0	0	0	4	1	0	0	0	0	6	19	
8:30 AM	0	6	0	0	0	0	0	0	0	1	0	0	0	0	0	12	19	
8:35 AM	0	6	0	1	0	0	0	0	0	0	0	0	0	0	0	12	19	
8:40 AM	0	8	0	0	0	0	0	0	0	1	0	0	0	0	0	11	20	
8:45 AM	0	7	0	1	0	0	0	0	0	0	0	0	0	0	0	20	28	
8:50 AM	0	3	0	1	0	0	0	0	0	2	0	0	0	0	0	5	11	
8:55 AM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	4	6	
Count Total	0	185	0	14	0	0	0	0	0	35	2	0	0	0	0	166	402	
Peak Hour	0	122	0	8	0	0	0	0	0	23	2	0	0	0	0	104	259	

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
7:00 AM	0	1	0	0	1	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	1	0	0	0	1	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	1	0	0	0	1	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	0	0	0	1	1	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	1	0	0	0	1	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	0	1	0	0	1	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	1	0	0	0	1	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	1	0	0	0	1	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0	8:30 AM	0	1	0	0	1	8:30 AM	0	0	0	0	0
8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	2	0	0	0	2	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	7	2	0	1	10	Count Total	0	1	0	0	1	Count Total	0	0	0	0	0
Peak Hour	3	1	0	0	4	Peak Hour	0	1	0	0	1	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
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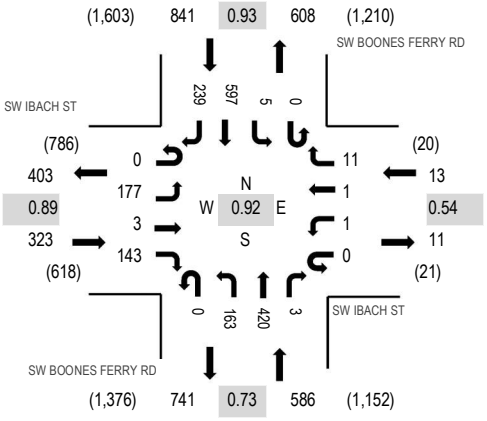
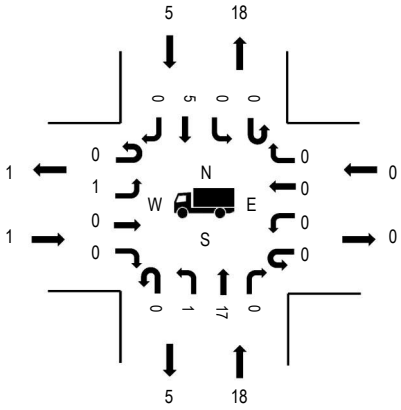
Location: 1 SW BOONES FERRY RD & SW IBACH ST PM
Date: Thursday, October 20, 2022
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:40 PM - 04:55 PM

Peak Hour

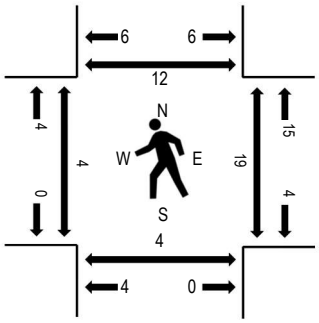
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.3%	0.89
WB	0.0%	0.54
NB	3.1%	0.73
SB	0.6%	0.93
All	1.4%	0.92

Traffic Counts - Motorized Vehicles

Interval Start Time	SW IBACH ST Eastbound				SW IBACH ST Westbound				SW BOONES FERRY RD Northbound				SW BOONES FERRY RD 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	17	0	7	0	1	1	2	0	35	66	0	0	0	47	13	189	1,763
4:05 PM	0	17	0	12	0	0	0	2	0	14	42	0	0	0	37	17	141	1,723
4:10 PM	0	11	0	9	0	0	0	0	0	7	37	1	0	0	50	20	135	1,757
4:15 PM	0	15	0	7	0	0	0	1	0	9	33	0	0	0	56	25	146	1,752
4:20 PM	0	14	0	13	0	0	0	1	0	9	26	0	0	1	42	18	124	1,762
4:25 PM	0	9	1	14	0	0	0	0	0	9	32	0	0	0	46	27	138	1,758
4:30 PM	0	18	0	15	0	0	0	1	0	9	26	0	0	0	52	20	141	1,754
4:35 PM	0	15	0	15	0	0	0	1	0	11	24	0	0	0	50	20	136	1,746
4:40 PM	0	17	2	11	0	0	0	1	0	11	29	0	0	0	61	17	149	1,731
4:45 PM	0	14	0	12	0	0	0	1	0	16	43	0	0	1	54	27	168	1,708
4:50 PM	0	15	0	17	0	0	0	0	0	17	36	1	0	1	54	19	160	1,670
4:55 PM	0	15	0	11	0	0	0	1	0	16	26	1	0	2	48	16	136	1,653
5:00 PM	0	21	0	7	0	0	0	0	0	18	46	0	0	0	43	14	149	1,630
5:05 PM	0	14	0	6	0	0	0	0	0	17	53	0	0	1	57	27	175	
5:10 PM	0	14	0	11	0	0	0	0	0	14	29	0	0	1	49	12	130	
5:15 PM	0	24	0	7	0	0	1	0	0	6	36	0	0	1	54	27	156	
5:20 PM	0	10	0	6	0	0	1	0	0	11	21	0	0	0	51	20	120	
5:25 PM	0	15	0	9	0	0	0	0	0	6	37	0	0	1	44	22	134	
5:30 PM	0	14	0	7	0	1	0	2	0	14	26	2	0	0	46	21	133	
5:35 PM	0	17	0	8	0	0	0	0	0	8	28	0	0	1	37	22	121	
5:40 PM	0	16	0	13	0	0	0	0	0	14	33	0	0	1	36	13	126	
5:45 PM	0	17	0	12	0	0	0	0	0	18	34	0	0	0	36	13	130	
5:50 PM	0	10	0	11	0	1	0	0	0	14	45	0	0	2	45	15	143	
5:55 PM	0	17	0	9	0	0	0	1	0	14	22	0	0	0	29	21	113	
Count Total	0	366	3	249	0	3	3	14	0	317	830	5	0	13	1,124	466	3,393	
Peak Hour	0	177	3	143	0	1	1	11	0	163	420	3	0	5	597	239	1,763	

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	14	0	1	15	4:00 PM	0	0	0	0	0	4:00 PM	0	0	4	1	5
4:05 PM	0	1	0	0	1	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	1	1	4:10 PM	0	0	0	1	1	4:10 PM	0	0	1	1	2
4:15 PM	0	0	0	1	1	4:15 PM	0	0	0	0	0	4:15 PM	0	3	5	1	9
4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0	4:20 PM	0	0	2	0	2
4:25 PM	0	1	0	0	1	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	1	1
4:35 PM	0	1	0	1	2	4:35 PM	0	0	0	1	1	4:35 PM	1	1	2	0	4
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0	4:40 PM	0	0	2	4	6
4:45 PM	0	0	0	0	0	4:45 PM	1	0	0	0	1	4:45 PM	0	0	2	2	4
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	1	1	0	1	3	4:55 PM	0	2	0	0	2	4:55 PM	3	0	1	2	6
5:00 PM	1	0	0	1	2	5:00 PM	0	0	0	0	0	5:00 PM	0	1	0	0	1
5:05 PM	0	1	0	0	1	5:05 PM	0	0	0	0	0	5:05 PM	2	0	0	0	2
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	1	1
5:15 PM	0	1	0	0	1	5:15 PM	1	0	0	0	1	5:15 PM	0	0	1	1	2
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	1	1	2	0	4
5:25 PM	0	0	0	1	1	5:25 PM	0	1	0	0	1	5:25 PM	0	0	2	1	3
5:30 PM	0	2	0	0	2	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	1	1
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	1	0	0	1
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	1	0	0	1	5:45 PM	1	1	0	1	3	5:45 PM	0	0	1	1	2
5:50 PM	0	0	0	2	2	5:50 PM	0	0	0	0	0	5:50 PM	0	0	1	2	3
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	2	23	0	9	34	Count Total	3	4	0	3	10	Count Total	7	7	26	19	59
Peak Hour	1	18	0	5	24	Peak Hour	1	2	0	2	5	Peak Hour	4	4	19	12	39

ALL TRAFFIC DATA SERVICES
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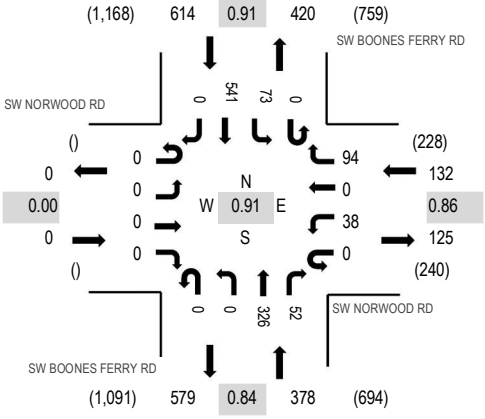
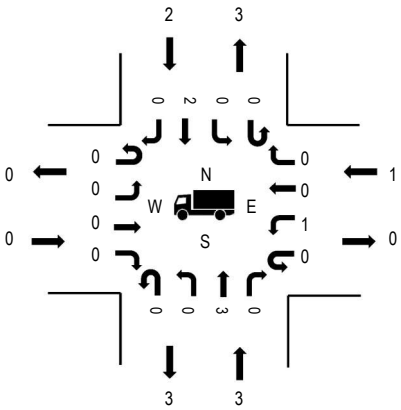
Location: 2 SW BOONES FERRY RD & SW NORWOOD RD PM
Date: Thursday, October 20, 2022
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 04:35 PM - 04:50 PM

Peak Hour

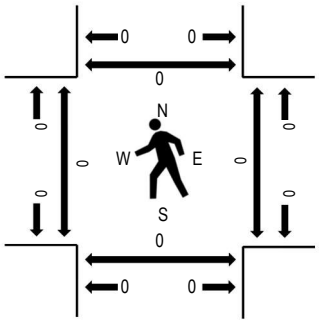
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.00
WB	0.8%	0.86
NB	0.8%	0.84
SB	0.3%	0.91
All	0.5%	0.91

Traffic Counts - Motorized Vehicles

Interval Start Time	SW NORWOOD RD Eastbound				SW NORWOOD RD Westbound				SW BOONES FERRY RD Northbound				SW BOONES FERRY RD 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	0	0	0	2	0	2	0	0	25	0	0	3	46	0	78	1,088
4:05 PM	0	0	0	0	0	1	0	5	0	0	19	1	0	6	40	0	72	1,097
4:10 PM	0	0	0	0	0	3	0	4	0	0	27	7	0	6	53	0	100	1,122
4:15 PM	0	0	0	0	0	2	0	9	0	0	17	8	0	11	51	0	98	1,121
4:20 PM	0	0	0	0	0	5	0	7	0	0	17	3	0	6	50	0	88	1,106
4:25 PM	0	0	0	0	0	1	0	3	1	0	26	4	0	10	33	0	78	1,104
4:30 PM	0	0	0	0	0	0	0	7	0	0	21	4	0	7	48	0	87	1,124
4:35 PM	0	0	0	0	0	5	0	12	0	0	21	5	0	8	47	0	98	1,112
4:40 PM	0	0	0	0	0	2	0	5	0	0	33	4	0	6	55	0	105	1,079
4:45 PM	0	0	0	0	0	1	0	7	0	0	39	4	0	6	49	0	106	1,055
4:50 PM	0	0	0	0	0	2	0	10	0	0	22	3	0	10	51	0	98	1,028
4:55 PM	0	0	0	0	0	6	0	9	0	0	19	3	0	3	40	0	80	1,031
5:00 PM	0	0	0	0	0	1	0	11	0	0	35	4	0	5	31	0	87	1,002
5:05 PM	0	0	0	0	0	2	0	8	0	0	37	4	0	3	43	0	97	
5:10 PM	0	0	0	0	0	7	0	6	0	0	29	4	0	5	48	0	99	
5:15 PM	0	0	0	0	0	5	0	4	0	0	19	5	0	5	45	0	83	
5:20 PM	0	0	0	0	0	3	0	5	0	0	22	7	0	7	42	0	86	
5:25 PM	0	0	0	0	0	4	0	10	0	0	29	5	0	8	42	0	98	
5:30 PM	0	0	0	0	0	3	0	6	0	0	18	2	0	7	39	0	75	
5:35 PM	0	0	0	0	0	3	0	7	0	0	19	2	0	1	33	0	65	
5:40 PM	0	0	0	0	0	0	0	10	0	0	31	4	0	4	32	0	81	
5:45 PM	0	0	0	0	0	5	0	4	0	0	22	2	0	5	41	0	79	
5:50 PM	0	0	0	0	0	5	0	7	0	0	36	6	0	9	38	0	101	
5:55 PM	0	0	0	0	0	1	0	1	0	0	17	2	0	6	24	0	51	
Count Total	0	0	0	0	0	69	0	159	1	0	600	93	0	147	1,021	0	2,090	
Peak Hour	0	0	0	0	0	38	0	94	0	0	326	52	0	73	541	0	1,124	

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	1	0	0	1	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	0	0	4:05 PM	0	1	0	0	1	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	1	1	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	1	0	0	1	4:15 PM	0	0	0	1	1	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	1	1	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	1	1
4:25 PM	0	1	1	0	2	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0	4:30 PM	0	0	1	0	1	4:30 PM	0	0	0	0	0
4:35 PM	0	1	1	0	2	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM	0	2	0	0	2	4:50 PM	0	0	0	0	0
4:55 PM	0	1	0	1	2	4:55 PM	0	0	0	3	3	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	1	0	0	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	1	1	5:25 PM	0	1	0	0	1	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	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	1	0	0	1	5:45 PM	0	1	0	0	1	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	2	2	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	0	7	2	6	15	Count Total	0	5	1	4	10	Count Total	0	0	0	1	1
Peak Hour	0	3	1	2	6	Peak Hour	0	3	1	3	7	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
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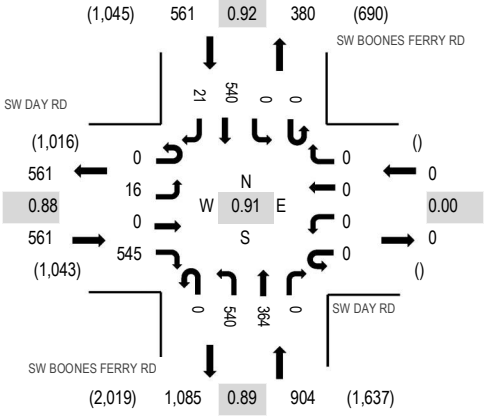
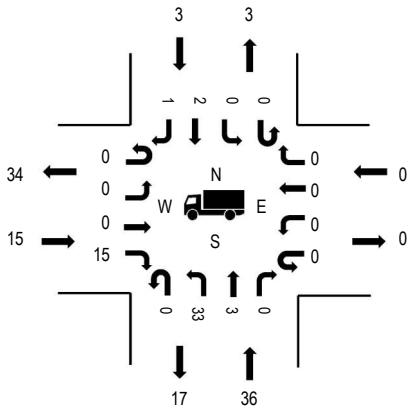
Location: 3 SW BOONES FERRY RD & SW DAY RD PM
Date: Thursday, October 20, 2022
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 04:35 PM - 04:50 PM

Peak Hour

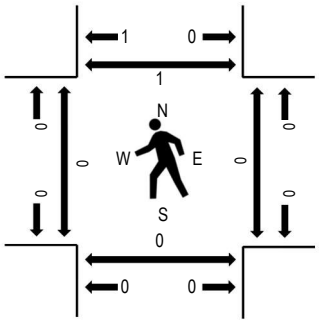
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.7%	0.88
WB	0.0%	0.00
NB	4.0%	0.89
SB	0.5%	0.92
All	2.7%	0.91

Traffic Counts - Motorized Vehicles

Interval Start Time	SW DAY RD Eastbound				SW DAY RD Westbound				SW BOONES FERRY RD Northbound				SW BOONES FERRY RD 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	1	0	51	0	0	0	0	0	38	24	0	0	0	54	3	171	2,012
4:05 PM	0	3	0	57	0	0	0	0	0	44	23	0	0	0	39	0	166	2,022
4:10 PM	0	1	0	61	0	0	0	0	0	47	31	0	0	0	48	3	191	2,022
4:15 PM	0	0	0	43	0	0	0	0	0	50	23	0	0	0	44	0	160	2,012
4:20 PM	0	0	0	28	0	0	0	0	0	52	20	0	0	0	57	3	160	2,010
4:25 PM	0	3	0	31	0	0	0	0	0	21	33	0	0	0	41	3	132	1,999
4:30 PM	0	1	0	39	0	0	0	0	0	47	24	0	0	0	50	0	161	2,026
4:35 PM	0	1	0	67	0	0	0	0	0	56	25	0	0	0	37	1	187	2,003
4:40 PM	0	2	0	49	0	0	0	0	0	45	42	0	0	0	42	1	181	1,963
4:45 PM	0	1	0	38	0	0	0	0	0	46	43	0	0	0	59	0	187	1,873
4:50 PM	0	1	0	31	0	0	0	0	0	38	27	0	0	0	51	2	150	1,794
4:55 PM	0	2	0	43	0	0	0	0	0	47	26	0	0	0	47	1	166	1,772
5:00 PM	0	1	0	53	0	0	0	0	0	50	33	0	0	0	39	5	181	1,713
5:05 PM	0	1	0	40	0	0	0	0	0	53	33	0	0	0	37	2	166	
5:10 PM	0	2	0	61	0	0	0	0	0	36	28	0	0	0	49	5	181	
5:15 PM	0	2	0	40	0	0	0	0	0	49	28	0	0	0	39	0	158	
5:20 PM	0	2	0	40	0	0	0	0	0	32	28	0	0	0	45	2	149	
5:25 PM	0	0	0	44	0	0	0	0	0	41	27	0	0	0	45	2	159	
5:30 PM	0	0	0	35	0	0	0	0	0	51	23	0	0	0	28	1	138	
5:35 PM	0	1	0	48	0	0	0	0	0	29	29	0	0	0	39	1	147	
5:40 PM	0	0	0	24	0	0	0	0	0	21	25	0	0	0	21	0	91	
5:45 PM	0	2	0	30	0	0	0	0	0	23	23	0	0	0	28	2	108	
5:50 PM	0	0	0	35	0	0	0	0	0	30	24	0	0	0	36	3	128	
5:55 PM	0	1	0	27	0	0	0	0	0	29	20	0	0	0	29	1	107	
Count Total	0	28	0	1,015	0	0	0	0	0	975	662	0	0	0	1,004	41	3,725	
Peak Hour	0	16	0	545	0	0	0	0	0	540	364	0	0	0	540	21	2,026	

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

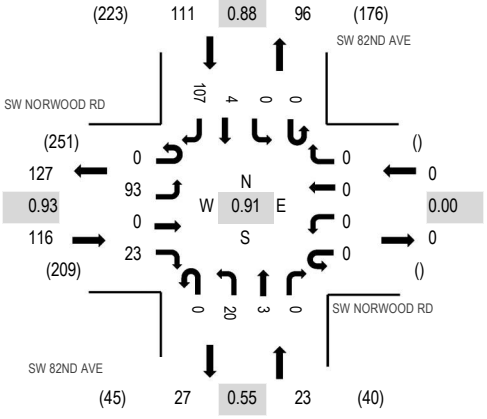
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	2	2	0	0	4	4:00 PM	0	1	0	0	1	4:00 PM	0	0	0	0	0
4:05 PM	0	6	0	0	6	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	1	5	0	1	7	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	2	1	0	0	3	4:15 PM	0	0	0	1	1	4:15 PM	0	0	0	0	0
4:20 PM	1	4	0	1	6	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	1	2	0	1	4	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	5	0	0	6	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	3	7	0	1	11	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	1	1
4:40 PM	0	6	0	0	6	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	5	0	0	5	4:45 PM	0	1	0	0	1	4:45 PM	0	0	0	0	0
4:50 PM	1	2	0	0	3	4:50 PM	0	1	0	0	1	4:50 PM	0	0	0	0	0
4:55 PM	2	1	0	1	4	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	1	0	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	2	2	0	0	4	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	2	5	0	0	7	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	2	1	0	0	3	5:15 PM	0	1	0	0	1	5:15 PM	0	0	0	0	0
5:20 PM	2	1	0	0	3	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	1	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	1	2	0	0	3	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	2	1	0	0	3	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	1	0	0	1	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	2	2	0	0	4	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	3	0	0	3	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	27	65	0	6	98	Count Total	0	4	0	1	5	Count Total	0	0	0	1	1
Peak Hour	15	36	0	3	54	Peak Hour	0	3	0	0	3	Peak Hour	0	0	0	1	1

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

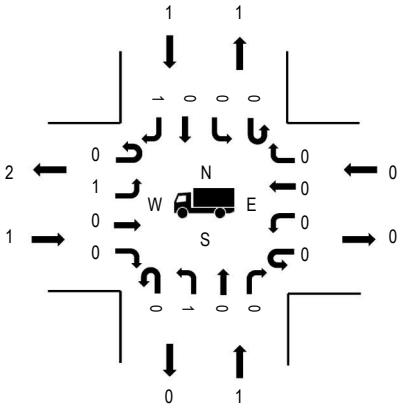
Location: 4 SW 82ND AVE & SW NORWOOD RD PM
Date: Thursday, October 20, 2022
Peak Hour: 04:10 PM - 05:10 PM
Peak 15-Minutes: 04:25 PM - 04:40 PM

Peak Hour

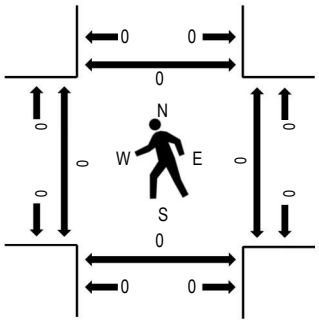
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.9%	0.93
WB	0.0%	0.00
NB	4.3%	0.55
SB	0.9%	0.88
All	1.2%	0.91

Traffic Counts - Motorized Vehicles

Interval Start Time	SW NORWOOD RD Eastbound				SW NORWOOD RD Westbound				SW 82ND AVE Northbound				SW 82ND AVE 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	8	0	3	0	0	0	0	0	1	0	0	0	0	0	5	17	243
4:05 PM	0	7	0	2	0	0	0	0	0	0	0	0	0	0	1	6	16	244
4:10 PM	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	9	19	250
4:15 PM	0	10	0	2	0	0	0	0	0	2	0	0	0	0	0	9	23	248
4:20 PM	0	7	0	1	0	0	0	0	0	1	0	0	0	0	0	8	17	238
4:25 PM	0	11	0	1	0	0	0	0	0	0	0	0	0	0	0	9	21	243
4:30 PM	0	10	0	1	0	0	0	0	0	1	0	0	0	0	0	12	24	245
4:35 PM	0	7	0	2	0	0	0	0	0	1	0	0	0	0	0	14	24	240
4:40 PM	0	6	0	2	0	0	0	0	0	4	0	0	0	0	2	4	18	231
4:45 PM	0	10	0	1	0	0	0	0	0	5	1	0	0	0	1	0	18	232
4:50 PM	0	9	0	1	0	0	0	0	0	0	0	0	0	0	1	12	23	238
4:55 PM	0	9	0	3	0	0	0	0	0	3	0	0	0	0	0	8	23	233
5:00 PM	0	3	0	2	0	0	0	0	0	2	0	0	0	0	0	11	18	229
5:05 PM	0	6	0	2	0	0	0	0	0	1	2	0	0	0	0	11	22	
5:10 PM	0	5	0	0	0	0	0	0	0	1	0	0	0	0	0	11	17	
5:15 PM	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	10	13	
5:20 PM	0	12	0	1	0	0	0	0	0	1	0	0	0	0	1	7	22	
5:25 PM	0	8	0	1	0	0	0	0	0	0	0	0	0	0	0	14	23	
5:30 PM	0	2	0	2	0	0	0	0	0	2	0	0	0	0	0	13	19	
5:35 PM	0	3	0	1	0	0	0	0	0	1	0	0	0	0	0	10	15	
5:40 PM	0	7	0	0	0	0	0	0	0	3	0	0	0	0	0	9	19	
5:45 PM	0	9	0	2	0	0	0	0	0	1	0	0	0	0	1	11	24	
5:50 PM	0	6	0	2	0	0	0	0	0	1	2	0	0	0	0	7	18	
5:55 PM	0	9	0	1	0	0	0	0	0	3	0	0	0	0	0	6	19	
Count Total	0	171	0	38	0	0	0	0	0	35	5	0	0	0	7	216	472	
Peak Hour	0	93	0	23	0	0	0	0	0	20	3	0	0	0	4	107	250	

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	0	0	0	0	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	1	0	0	0	1	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	0	1	1	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	1	0	0	1	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0	5:00 PM	3	0	0	0	3	5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	2	2
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	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	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	0	0	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	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	1	1	0	1	3	Count Total	3	0	0	0	3	Count Total	0	0	0	2	2
Peak Hour	1	1	0	1	3	Peak Hour	3	0	0	0	3	Peak Hour	0	0	0	0	0

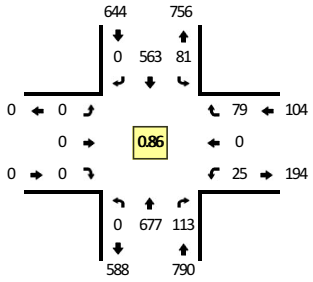
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

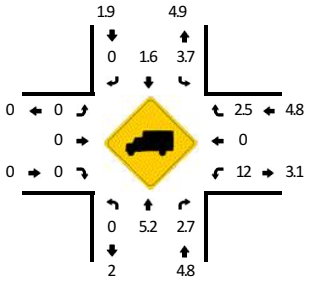
LOCATION: SW Boones Ferry Rd -- SW Norwood Rd | **QC JOB #:** 15885301

CITY/STATE: Tualatin, OR | **DATE:** Wed, Sep 29 2021

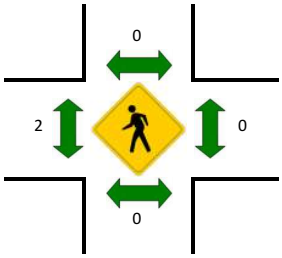
Peak-Hour: 4:30 PM -- 5:30 PM

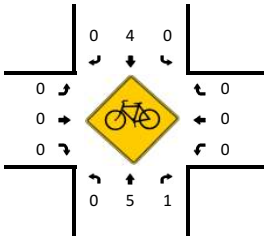
Peak 15-Min: 4:50 PM -- 5:05 PM

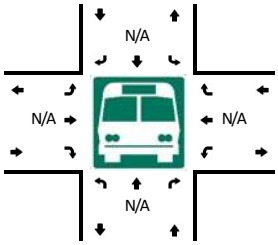


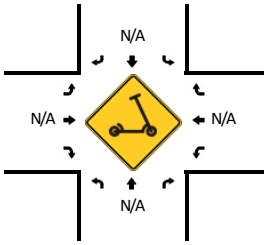


Quality Counts
DATA THAT DRIVES COMMUNITIES









5-Min Count Period Beginning At	SW Boones Ferry Rd (Northbound)				SW Boones Ferry Rd (Southbound)				SW Norwood Rd (Eastbound)				SW Norwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	20	2	0	4	10	0	0	0	0	0	0	3	0	4	0	43	
7:05 AM	0	18	1	0	2	10	0	0	0	0	0	0	1	0	4	0	36	
7:10 AM	0	14	1	0	5	16	0	0	0	0	0	0	3	0	2	0	41	
7:15 AM	0	12	4	0	1	22	0	0	0	0	0	0	2	0	1	0	42	
7:20 AM	0	15	1	0	2	21	0	0	0	0	0	0	1	0	0	0	40	
7:25 AM	0	33	0	0	2	15	0	0	0	0	0	0	1	0	4	0	55	
7:30 AM	0	26	0	0	2	19	0	0	0	0	0	0	4	0	2	0	53	
7:35 AM	0	16	1	0	4	21	0	0	0	0	0	0	3	0	5	0	50	
7:40 AM	0	23	2	0	1	23	0	0	0	0	0	0	3	0	5	0	57	
7:45 AM	0	34	1	0	3	23	0	0	0	0	0	0	6	0	8	0	75	
7:50 AM	0	37	0	0	5	30	0	0	0	0	0	0	4	0	10	0	86	
7:55 AM	0	35	0	0	1	31	0	0	0	0	0	0	5	0	13	0	85	663
8:00 AM	0	30	3	0	6	27	0	0	0	0	0	0	2	0	6	0	74	694
8:05 AM	0	20	2	0	1	24	0	0	0	0	0	0	4	0	1	0	52	710
8:10 AM	0	25	3	0	2	22	0	0	0	0	0	0	8	0	7	0	67	736
8:15 AM	0	19	0	0	5	18	0	0	0	0	0	0	2	0	3	0	47	741
8:20 AM	0	17	4	0	4	12	0	0	0	0	0	0	0	0	6	0	43	744
8:25 AM	0	24	3	0	1	17	0	0	0	0	0	0	1	0	3	0	49	738
8:30 AM	0	33	3	0	3	20	0	0	0	0	0	0	4	0	9	0	72	757
8:35 AM	0	23	3	0	3	22	0	0	0	0	0	0	2	0	11	0	64	771
8:40 AM	0	14	1	0	4	13	0	0	0	0	0	0	1	0	21	0	54	768
8:45 AM	0	27	0	0	1	13	0	0	0	0	0	0	5	0	20	0	66	759
8:50 AM	0	18	1	0	5	20	0	0	0	0	0	0	3	0	8	0	55	728
8:55 AM	0	22	2	0	7	21	0	0	0	0	0	0	1	0	1	0	54	697
9:00 AM	0	16	2	0	3	19	0	0	0	0	0	0	1	0	1	0	42	665
9:05 AM	0	15	3	0	5	20	0	0	0	0	0	0	1	0	2	0	46	659
9:10 AM	0	20	2	0	2	16	0	0	0	0	0	0	1	0	1	0	42	634
9:15 AM	0	23	4	0	0	25	0	0	0	0	0	0	3	0	7	0	62	649
9:20 AM	0	8	2	0	0	16	0	0	0	0	0	0	0	0	7	0	33	639
9:25 AM	0	20	3	0	1	17	0	0	0	0	0	0	2	0	3	0	46	636
9:30 AM	0	7	0	0	1	26	0	0	0	0	0	0	1	0	2	0	37	601
9:35 AM	0	13	0	0	2	23	0	0	0	0	0	0	2	0	2	0	42	579
9:40 AM	0	8	1	0	1	14	0	0	0	0	0	0	4	0	8	0	36	561
9:45 AM	0	17	3	0	2	23	0	0	0	0	0	0	3	0	3	0	51	546
9:50 AM	0	16	0	0	1	18	0	0	0	0	0	0	1	0	1	0	37	528
9:55 AM	0	16	2	0	2	18	0	0	0	0	0	0	2	0	4	0	44	518
10:00 AM	0	12	1	1	1	23	0	0	0	0	0	0	1	0	1	0	40	516
10:05 AM	0	11	1	0	2	17	0	0	0	0	0	0	4	0	4	0	39	509
10:10 AM	0	14	0	0	3	15	0	0	0	0	0	0	4	0	2	0	38	505

5-Min Count Period Beginning At	SW Boones Ferry Rd (Northbound)				SW Boones Ferry Rd (Southbound)				SW Norwood Rd (Eastbound)				SW Norwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
10:15 AM	0	25	3	0	4	22	0	0	0	0	0	0	2	0	2	0	58	501
10:20 AM	0	26	2	0	3	12	0	0	0	0	0	0	2	0	1	0	46	514
10:25 AM	0	10	4	0	1	18	0	0	0	0	0	0	2	0	6	0	41	509
10:30 AM	0	24	3	0	0	18	0	0	0	0	0	0	2	0	2	0	49	521
10:35 AM	0	16	1	0	2	20	0	0	0	0	0	0	1	0	2	0	42	521
10:40 AM	0	16	2	0	0	21	0	0	0	0	0	0	3	0	3	0	45	530
10:45 AM	0	21	0	0	0	25	0	0	0	0	0	0	0	0	2	0	48	527
10:50 AM	0	18	0	0	2	14	0	0	0	0	0	0	1	0	5	0	40	530
10:55 AM	0	12	1	0	3	19	0	0	0	0	0	0	2	0	2	0	39	525
11:00 AM	0	12	0	0	2	14	0	0	0	0	0	0	3	0	2	0	33	518
11:05 AM	0	22	1	0	1	28	0	0	0	0	0	0	0	0	1	0	53	532
11:10 AM	0	17	3	0	1	20	0	0	0	0	0	0	2	0	0	0	43	537
11:15 AM	0	27	5	0	0	19	0	0	0	0	0	0	1	0	2	0	54	533
11:20 AM	0	20	3	0	2	20	0	0	0	0	0	0	1	0	2	0	48	535
11:25 AM	0	14	0	0	0	23	0	0	0	0	0	0	2	0	2	0	41	535
11:30 AM	0	24	2	0	1	16	0	0	0	0	0	0	1	0	1	0	45	531
11:35 AM	0	16	4	0	3	17	0	0	0	0	0	0	3	0	5	0	48	537
11:40 AM	0	24	2	0	4	23	0	0	0	0	0	0	3	0	3	0	59	551
11:45 AM	0	27	0	0	4	21	0	0	0	0	0	0	2	0	2	0	56	559
11:50 AM	0	20	4	0	4	21	0	0	0	0	0	0	2	0	4	0	55	574
11:55 AM	0	22	3	0	2	16	0	0	0	0	0	0	1	0	4	0	48	583
12:00 PM	0	25	1	0	3	14	0	0	0	0	0	0	2	0	7	0	52	602
12:05 PM	0	17	4	0	2	22	0	0	0	0	0	0	4	0	5	0	54	603
12:10 PM	0	26	3	0	5	17	0	0	0	0	0	0	3	0	4	0	58	618
12:15 PM	0	21	5	0	4	22	0	0	0	0	0	0	3	0	4	0	59	623
12:20 PM	0	15	2	0	2	24	0	0	0	0	0	0	1	0	2	0	46	621
12:25 PM	0	27	0	0	4	28	0	0	0	0	0	0	2	0	5	0	66	646
12:30 PM	0	14	2	0	1	19	0	0	0	0	0	0	6	0	3	0	45	646
12:35 PM	0	31	1	0	2	23	0	0	0	0	0	0	1	0	2	0	60	658
12:40 PM	0	26	0	0	3	24	0	0	0	0	0	0	1	0	6	0	60	659
12:45 PM	0	22	3	0	3	20	0	0	0	0	0	0	1	0	2	0	51	654
12:50 PM	0	25	1	0	2	23	0	0	0	0	0	0	2	0	2	0	55	654
12:55 PM	0	18	5	0	1	22	0	0	0	0	0	0	3	0	2	0	51	657
1:00 PM	0	32	5	0	2	26	0	0	0	0	0	0	5	0	3	0	73	678
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1:15 PM	0	13	3	0	3	12	0	0	0	0	0	0	3	0	5	0	39	647
1:20 PM	0	18	0	0	2	23	0	0	0	0	0	0	0	0	5	0	48	649
1:25 PM	0	15	5	0	3	28	0	0	0	0	0	0	2	0	2	0	55	638
1:30 PM	0	16	4	0	1	23	0	0	0	0	0	0	1	0	4	0	49	642
1:35 PM	0	23	5	0	2	25	0	0	0	0	0	0	3	0	5	0	63	645
1:40 PM	0	27	4	0	3	27	0	0	0	0	0	0	0	0	1	0	62	647
1:45 PM	0	21	4	0	6	24	0	0	0	0	0	0	2	0	1	0	58	654
1:50 PM	0	18	1	0	2	15	0	0	0	0	0	0	2	0	6	0	44	643
1:55 PM	0	19	2	0	6	17	0	0	0	0	0	0	1	0	2	0	47	639
2:00 PM	0	12	3	0	1	21	0	0	0	0	0	0	0	0	3	0	40	606
2:05 PM	0	34	2	0	1	22	0	0	0	0	0	0	5	0	3	0	67	623
2:10 PM	0	26	7	0	4	32	0	0	0	0	0	0	0	0	6	0	75	647
2:15 PM	0	24	4	0	1	15	0	0	0	0	0	0	4	0	2	0	50	658
2:20 PM	0	21	3	0	10	23	0	0	0	0	0	0	4	0	2	0	63	673
2:25 PM	0	40	4	0	2	37	0	0	0	0	0	0	3	0	6	0	92	710
2:30 PM	0	16	2	0	1	20	0	0	0	0	0	0	1	0	4	0	44	705
2:35 PM	0	18	5	0	8	33	0	0	0	0	0	0	3	0	5	0	72	714
2:40 PM	0	26	6	0	3	43	0	0	0	0	0	0	3	0	5	0	86	738
2:45 PM	0	28	3	0	6	39	0	0	0	0	0	0	5	0	5	0	86	766
2:50 PM	0	25	2	0	7	33	0	0	0	0	0	0	2	0	3	0	72	794
2:55 PM	0	24	2	0	5	20	0	0	0	0	0	0	4	0	4	0	59	806
3:00 PM	0	14	3	0	4	17	0	0	0	0	0	0	1	0	6	0	45	811
3:05 PM	0	13	1	0	7	30	0	0	0	0	0	0	1	0	7	0	59	803
3:10 PM	0	12	4	0	3	46	0	0	0	0	0	0	1	0	4	0	70	798
3:15 PM	0	16	1	0	5	43	0	0	0	0	0	0	4	0	8	0	77	825
3:20 PM	0	25	4	0	6	35	0	0	0	0	0	0	5	0	3	0	78	840
3:25 PM	0	18	4	0	4	27	0	0	0	0	0	0	0	0	13	0	66	814
3:30 PM	0	23	7	0	3	40	0	0	0	0	0	0	0	0	7	0	80	850
3:35 PM	0	36	2	0	8	40	0	0	0	0	0	0	3	0	10	0	99	877
3:40 PM	0	18	3	0	5	46	0	0	0	0	0	0	4	0	7	0	83	874
3:45 PM	0	27	1	0	10	46	0	0	0	0	0	0	3	0	10	0	97	885
3:50 PM	0	27	6	0	8	54	0	0	0	0	0	0	2	0	6	0	103	916
3:55 PM	0	20	3	0	14	47	0	0	0	0	0	0	1	0	10	0	95	952
4:00 PM	0	33	2	0	11	46	0	0	0	0	0	0	1	0	3	0	96	1003
4:05 PM	0	21	4	0	9	49	0	0	0	0	0	0	3	0	6	0	92	1036
4:10 PM	0	24	4	0	3	53	0	0	0	0	0	0	2	0	7	0	93	1059
4:15 PM	0	32	7	0	7	49	0	0	0	0	0	0	6	0	8	0	109	1091
4:20 PM	0	34	1	0	9	44	0	0	0	0	0	0	3	0	2	0	93	1106
4:25 PM	0	56	4	0	6	32	0	0	0	0	0	0	4	0	2	0	104	1144
4:30 PM	0	53	5	0	3	43	0	0	0	0	0	0	2	0	5	0	111	1175
4:35 PM	0	58	5	0	4	47	0	0	0	0	0	0	0	0	4	0	118	1194
4:40 PM	0	40	5	0	6	47	0	0	0	0	0	0	1	0	6	0	105	1216
4:45 PM	0	62	8	0	6	48	0	0	0	0	0	0	2	0	8	0	134	1253
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5:15 PM	0	52	16	0	8	42	0	0	0	0	0	0	3	0	5	0	126	1507
5:20 PM	0	46	18	0	6	44	0	0	0	0	0	0	3	0	5	0	122	1536
5:25 PM	0	37	15	0	6	43	0	0	0	0	0	0	1	0	4	0	106	1538

5-Min Count Period Beginning At	SW Boones Ferry Rd (Northbound)				SW Boones Ferry Rd (Southbound)				SW Norwood Rd (Eastbound)				SW Norwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
5:30 PM	0	25	5	0	5	37	0	0	0	0	0	0	2	0	19	0	93	1520
5:35 PM	0	32	6	0	8	39	0	0	0	0	0	0	5	0	7	0	97	1499
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5:45 PM	0	47	7	0	10	43	0	0	0	0	0	0	2	0	10	0	119	1469
5:50 PM	0	23	8	0	7	32	0	0	0	0	0	0	13	0	19	0	102	1423
5:55 PM	0	24	1	0	11	30	0	0	0	0	0	0	6	0	7	0	79	1342
6:00 PM	0	23	4	0	4	20	0	0	0	0	0	0	4	0	13	0	68	1271
6:05 PM	0	19	1	0	5	32	0	0	0	0	0	0	3	0	7	0	67	1192
6:10 PM	0	15	3	0	4	27	0	0	0	0	0	0	1	0	6	0	56	1125
6:15 PM	0	19	7	0	4	27	0	0	0	0	0	0	4	0	6	0	67	1066
6:20 PM	0	17	3	0	3	24	0	0	0	0	0	0	3	0	8	0	58	1002
6:25 PM	0	23	2	0	5	23	0	0	0	0	0	0	2	0	6	0	61	957
6:30 PM	0	19	3	0	2	23	0	0	0	0	0	0	2	0	5	0	54	918
6:35 PM	0	23	2	0	5	27	0	0	0	0	0	0	2	0	3	0	62	883
6:40 PM	0	21	1	0	7	22	0	0	0	0	0	0	1	0	5	0	57	850
6:45 PM	0	26	1	0	5	22	0	0	0	0	0	0	1	0	5	0	60	791
6:50 PM	0	19	0	0	6	24	0	0	0	0	0	0	2	0	7	0	58	747
6:55 PM	0	16	3	0	4	11	0	0	0	0	0	0	2	0	4	0	40	708

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	868	92	0	104	616	0	0	0	0	0	0	20	0	88	0	1788
Heavy Trucks	0	52	0		8	12	0		0	0	0		4	0	0		76
Buses																	
Pedestrians		0				0				4				0			4
Bicycles	0	4	4		0	12	0		0	0	0		0	0	0		20
Scooters																	

Comments:

Report generated on 7/18/2022 2:35 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Site Trips

The proposed development includes the construction of 320 detached home lots and 80 attached home lots. A supplemental memorandum addressing potential development of the commercial parcels abutting SW Boones Ferry Road is included in Appendix E. This memorandum includes trip generation for several potential commercial development scenarios of different intensities.

Trip Generation

To estimate trips that will be generated by the redevelopment, trip equations from the *Trip Generation Manual*[1] were used based on the number of dwelling units (DU). Land Use 210 – *Single-Family Detach Housing* was applied to the 320 detached units in the site while Land Use 220 – *Multifamily Housing (Low-Rise)* was applied to the 80 attached units.

As shown in Table 3, the trip generation calculations show that the proposed Autumn Sunrise Subdivision is estimated to generate 271 trips during the morning peak hour, 358 trips during the evening peak hour, and 3,596 daily trips during the average weekday.

Table 3: Trip Generation Summary

ITE Code	Intensity (DU)	Morning Peak Hour			Evening Peak Hour			Daily Trips
		In	Out	Total	In	Out	Total	
Single-Family Detached Housing	320	58	174	232	195	115	310	3,032
Multifamily Housing (Low-Rise)	80	9	30	39	30	18	48	564
Total	400	67	204	271	225	133	358	3,596

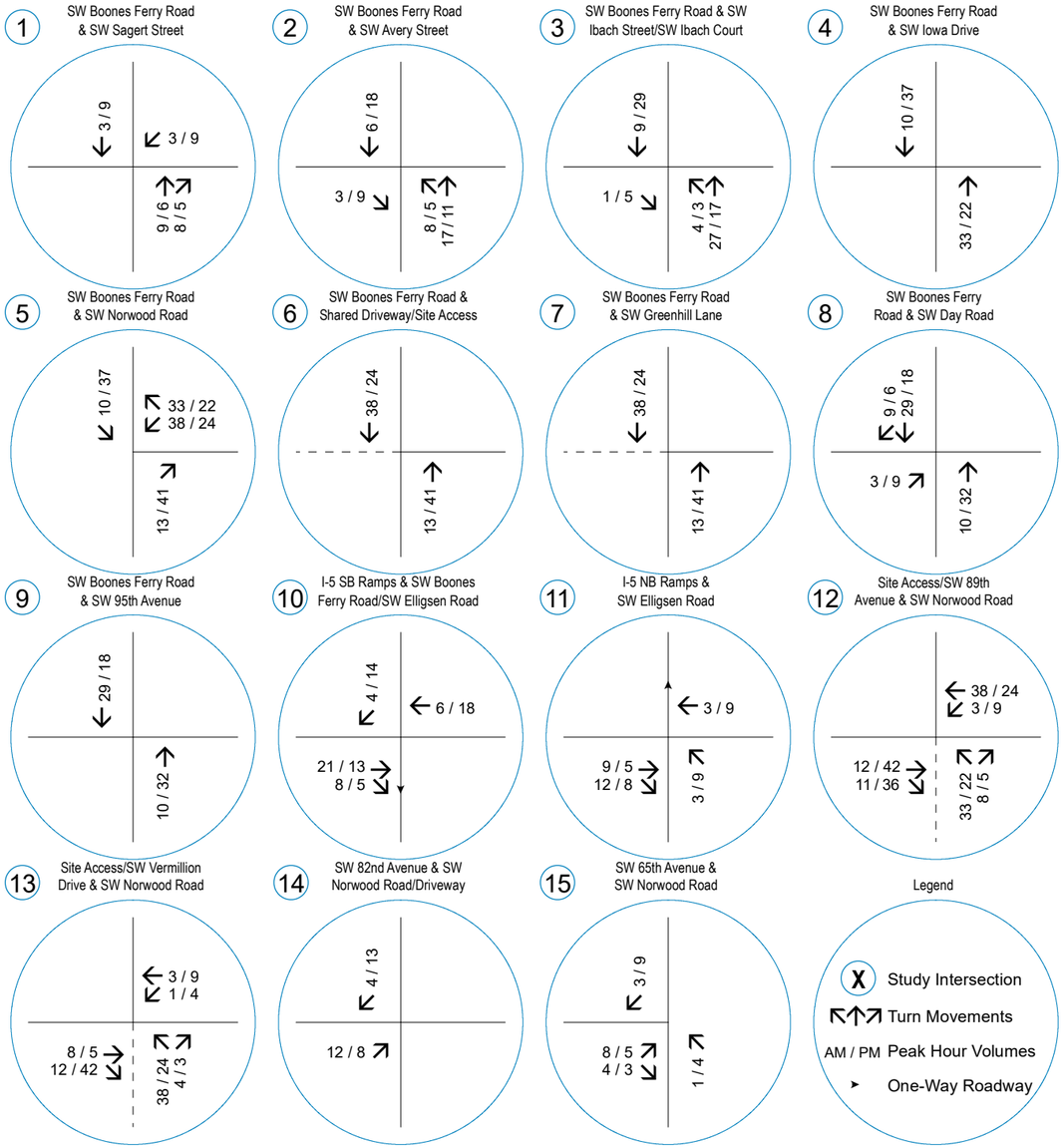
Note: Trip equations were applied for these land uses.

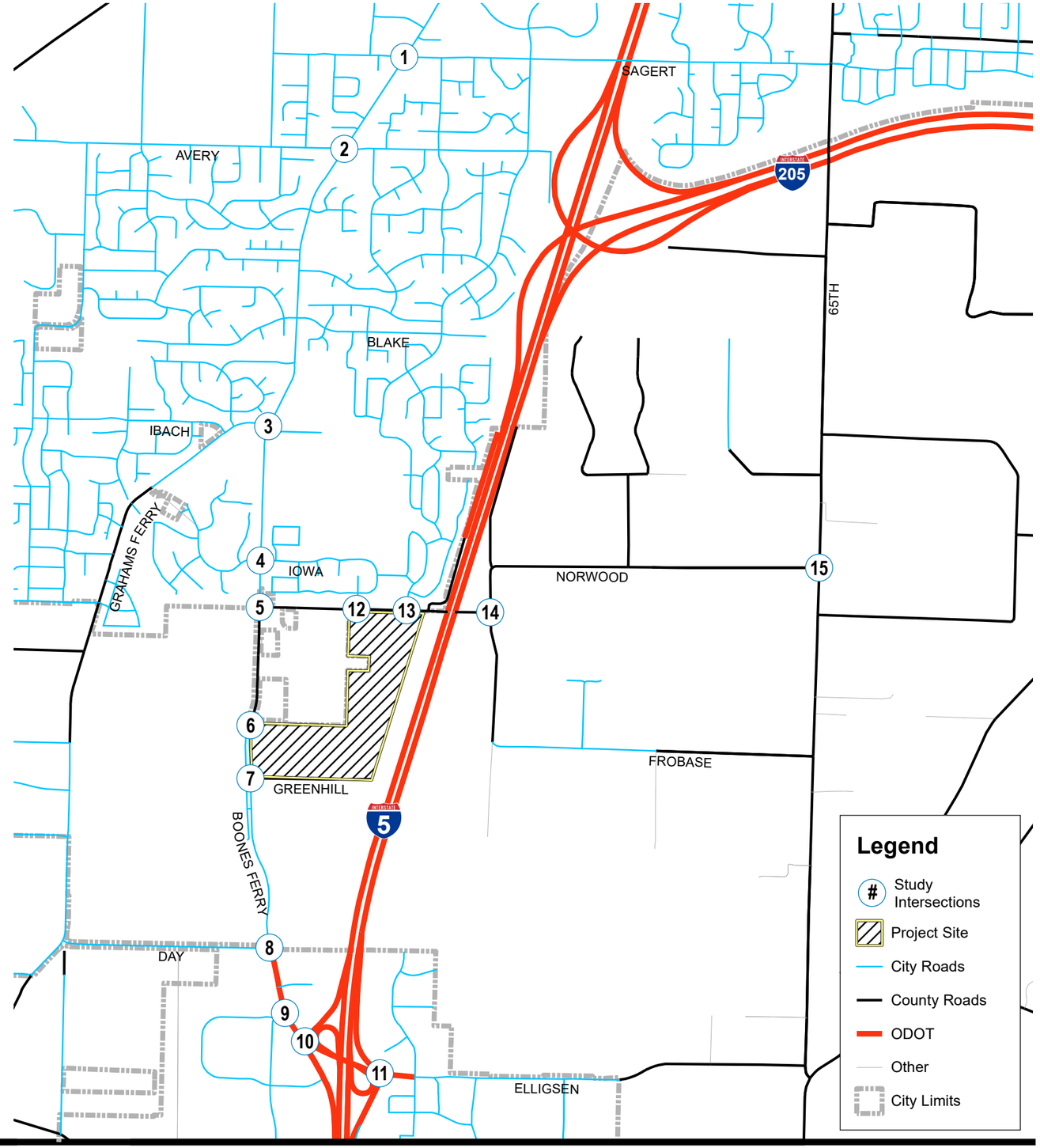
Table 4 presents the number and type of housing units and the trip generation by phase of development. With Phases 1 and 2, all site access will be taken from SW Norwood Road. The site access to SW Boones Ferry Road will be constructed with the completion of Phase 3. Phase 1 is expected to be constructed in year 2023 with each phase completed the subsequent year. Full buildout would occur in year 2026.

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 10th Edition, 2017.

Table 4: Trip Generation by Phase

Phase	Intensity (DU)			Morning Peak Hour			Evening Peak Hour			Daily Trips
	Single	Multi	Total	In	Out	Total	In	Out	Total	
1	85	24	109 (27%)	18	55	73	61	36	97	975
2	41	14	55 (14%)	9	28	37	30	18	48	487
3	91	42	133 (33%)	21	65	86	71	42	113	1,158
4	103	0	103 (26%)	19	56	75	63	37	100	976
Subtotal (1-2)	*126*	*38*	*164 (41%)*	*27*	*83*	*110*	*91*	*54*	*145*	*1,462*
Subtotal (1-3)	*217*	*80*	*297 (74%)*	*48*	*148*	*196*	*162*	*96*	*258*	*2,620*
Total (1-4)	320	80	400	67	204	271	225	133	358	3,596





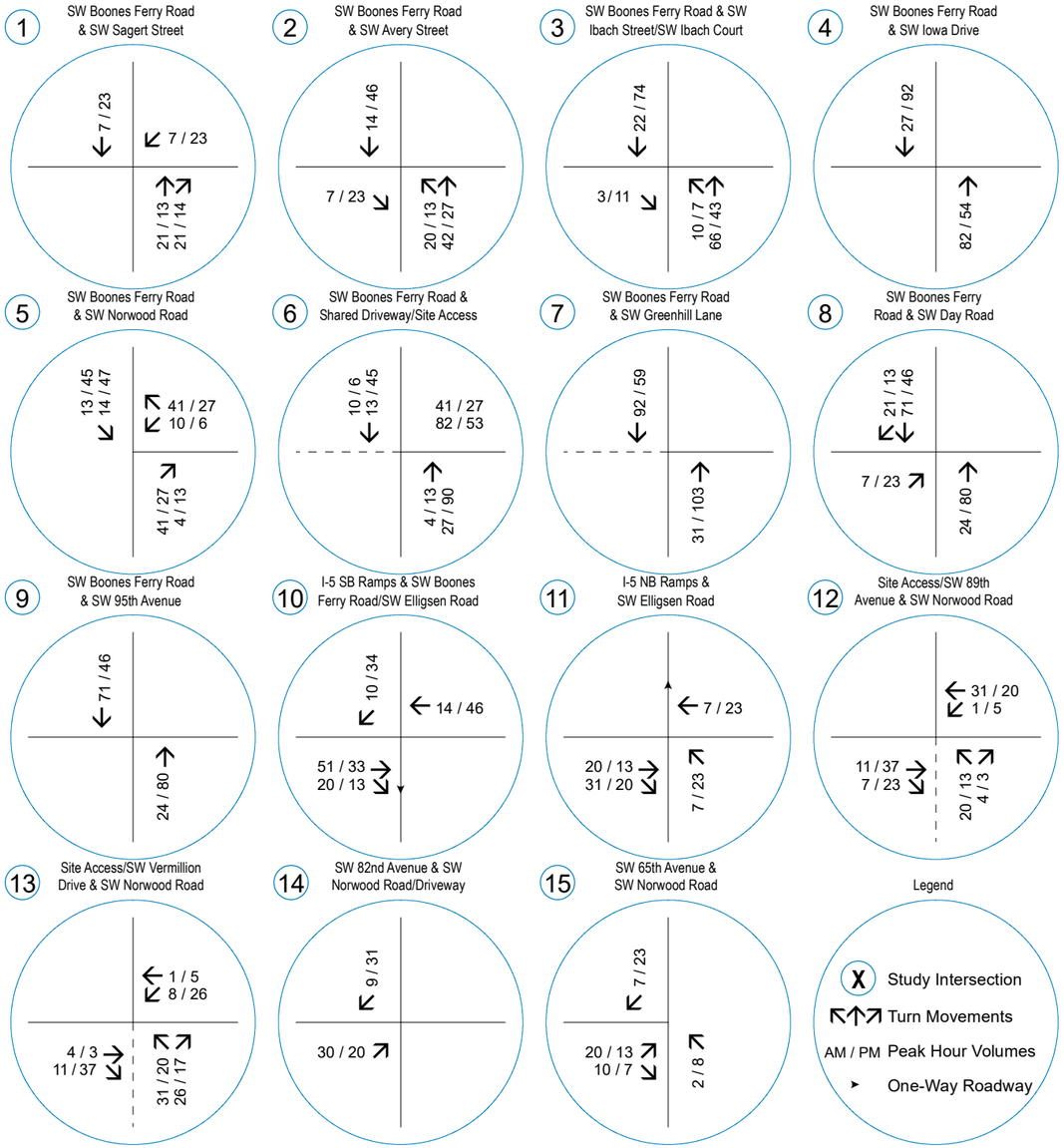
lancaster mobley

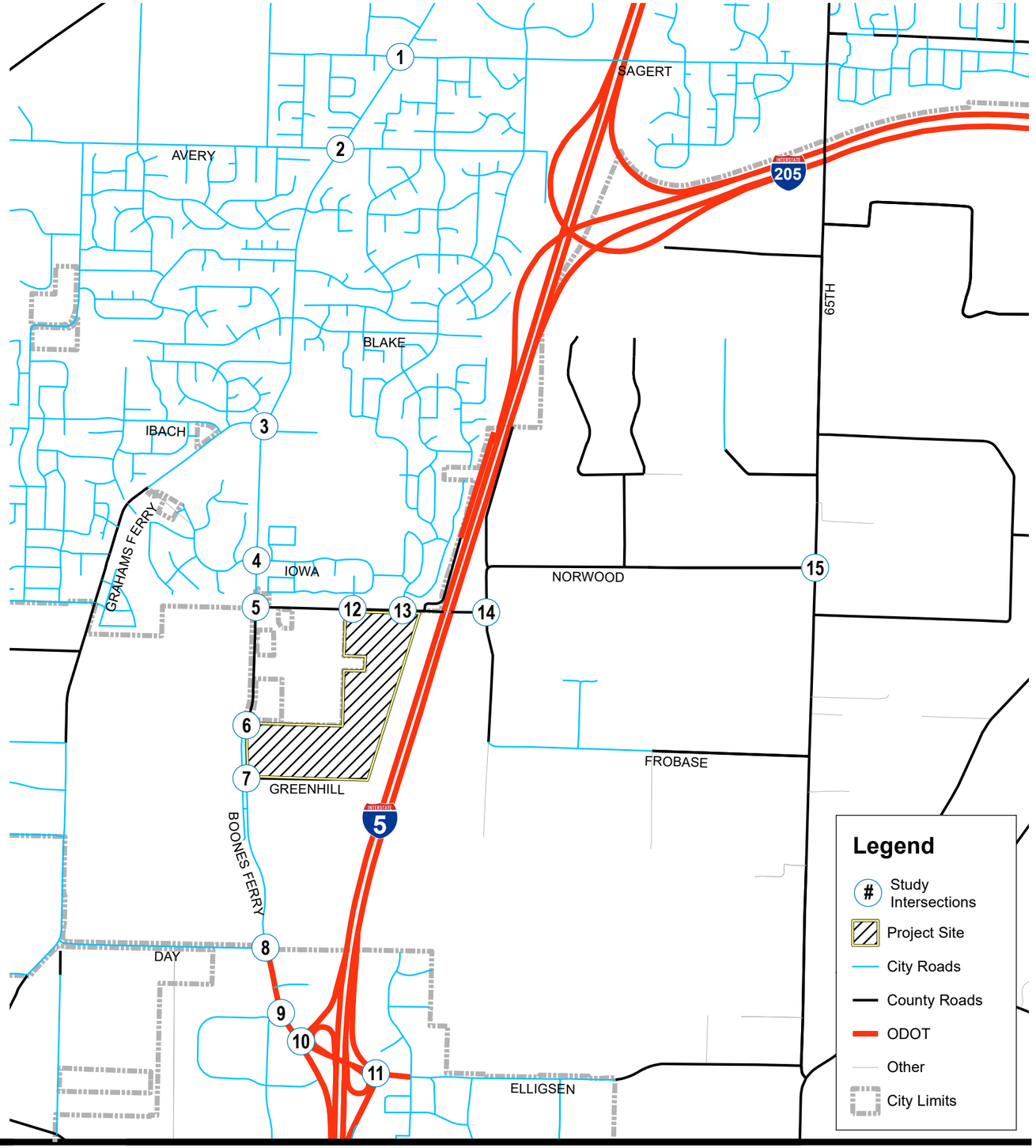
TRAFFIC VOLUMES

Trip Assignment - Phases 1-2

NOT TO SCALE

Figure 3A
Autumn Sunrise Subdivision TIS
6/24/2021





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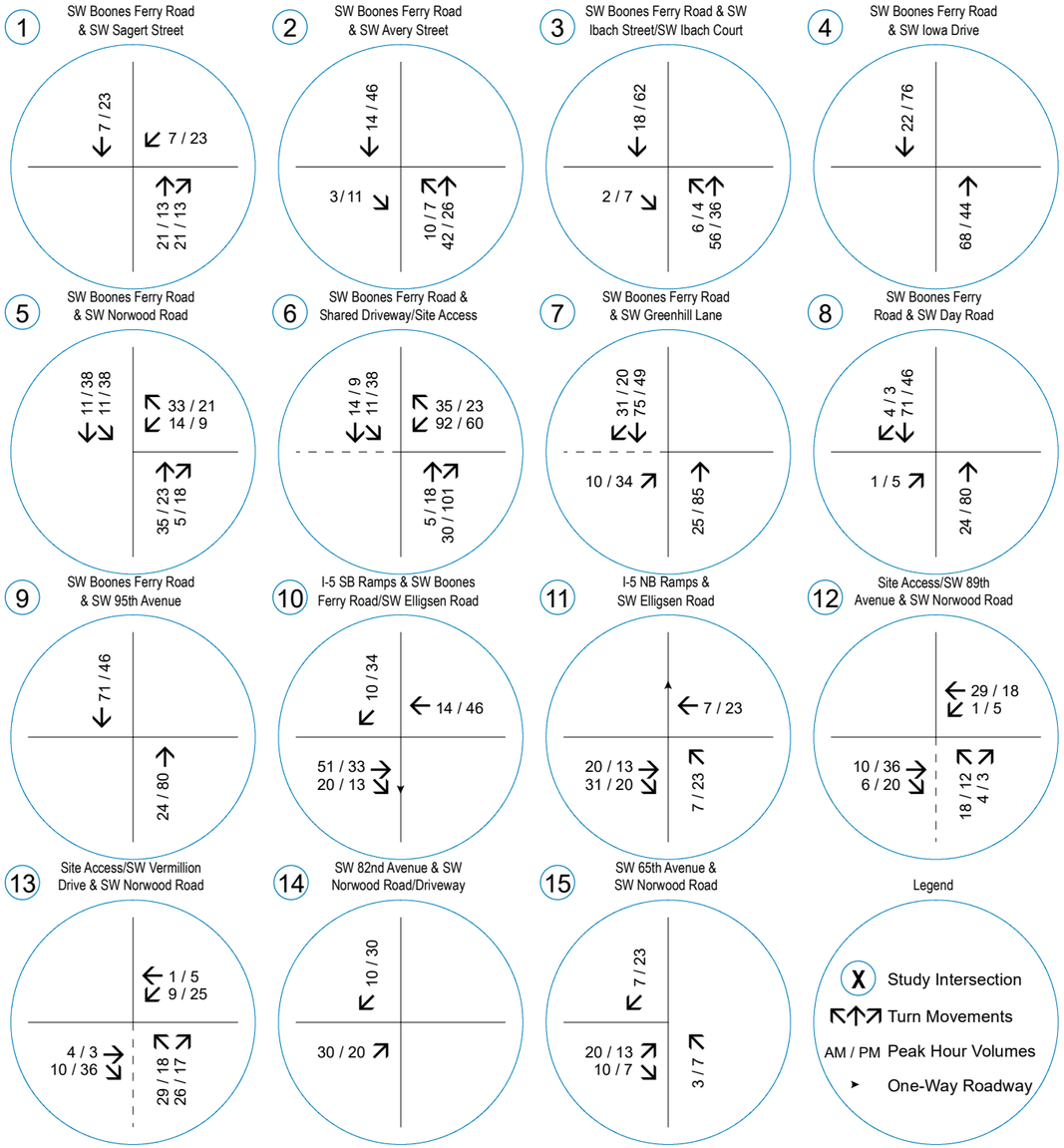
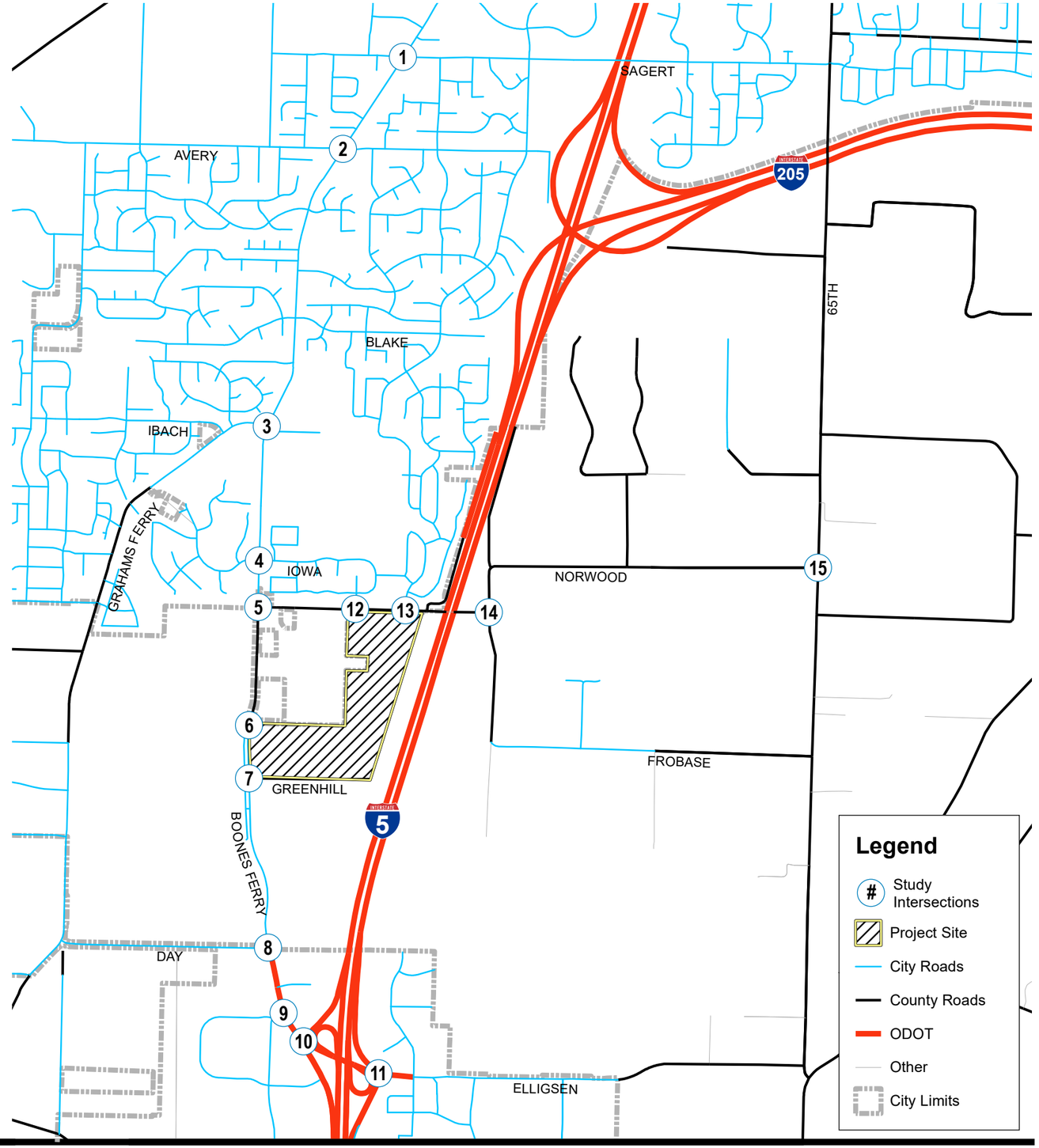
TRAFFIC VOLUMES

Trip Assignment - Phases 1-4

NOT TO SCALE

Figure 3B
Autumn Sunrise Subdivision TIS
6/24/2021





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TRAFFIC VOLUMES

Trip Assignment - Phases 1-4 with Basalt Creek Extension

NOT TO SCALE

Figure 3C
Autumn Sunrise Subdivision TIS
6/24/2021

Table 1 Trip Generation Summary

ITE Land Use	Dwelling Units (#)	Weekday						
		ADT	AM Peak Hour			PM Peak Hour		
			Total	Enter	Exit	Total	Enter	Exit
Mid-Rise Housing (#221)	116							
Generation Rate [1]		5.44	0.36	26%	74%	0.44	61%	39%
Site Trips		**631**	**42**	11	31	**51**	31	20

[1] Source: *Trip Generation*, 10th Edition, ITE, 2017, average rates.

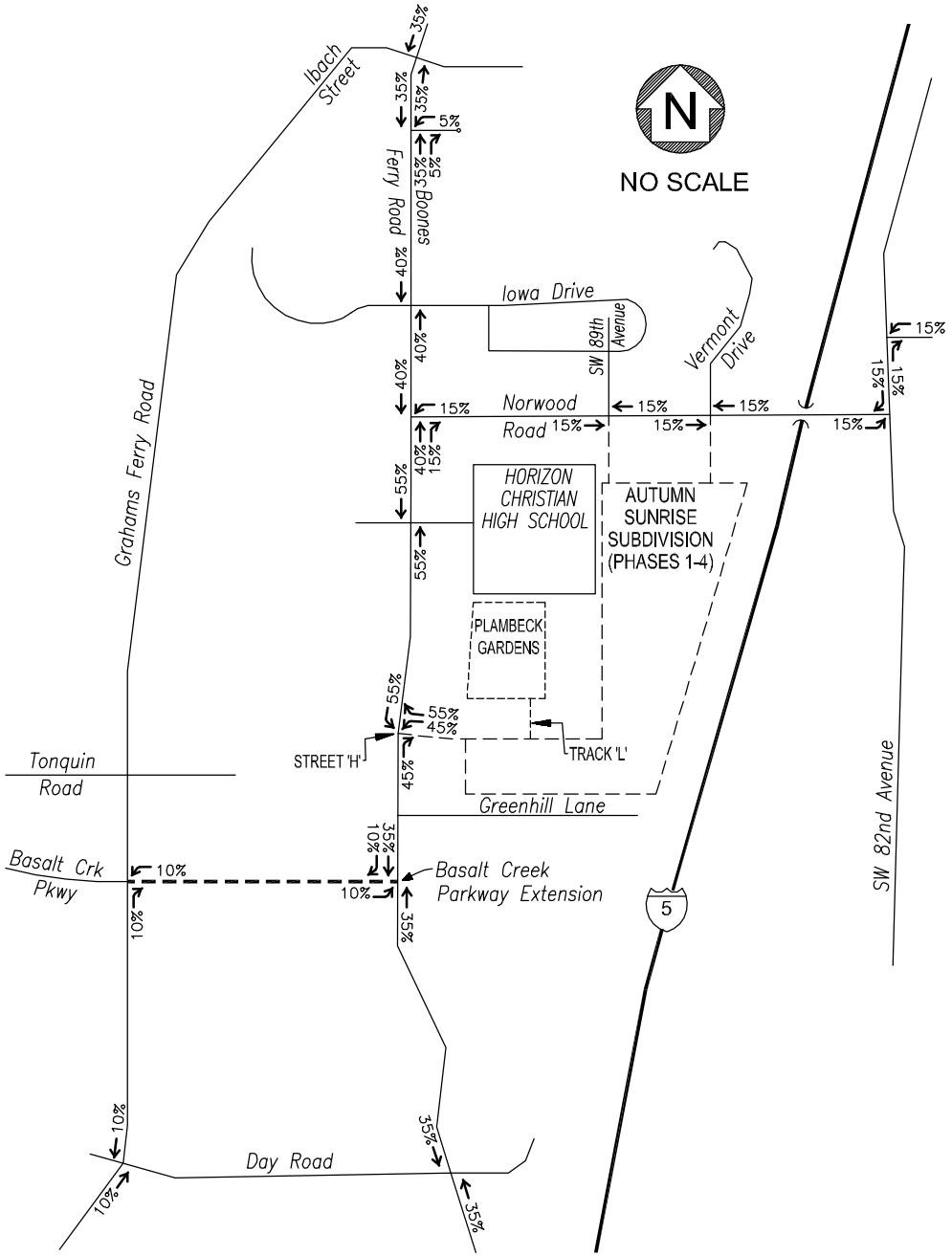
Two existing homes are located on the property site and will be demolished in conjunction with the proposed development. Trip credits totaling 19 daily trips, one AM trip, and two PM trips will result in a net trip generation of 612 daily trips, 41 AM peak hour trips, and 49 PM peak hour trips for Plambeck Gardens.

The Plambeck Gardens trip distribution was based on the existing count data and engineering judgment. This information is presented on Figure 4. The corresponding trip assignments are presented on Figure 5 for the AM & PM peak hours.

CAPACITY ANALYSIS

Capacity analyses were performed to determine the levels of service for the weekday peak hours. Synchro v11.1 software was used to determine the approach delays and level of service for the study intersections. The program is based on the Highway Capacity Manual (6^{th} edition) methodology. Table 2 summarizes the analysis results for the year 2021 existing traffic and for the year 2026 background and total traffic scenarios. Copies of the capacity analysis summaries are included in the appendix.

PLOT DATE: 01.25.22 FILE: 2114flow3.dwg



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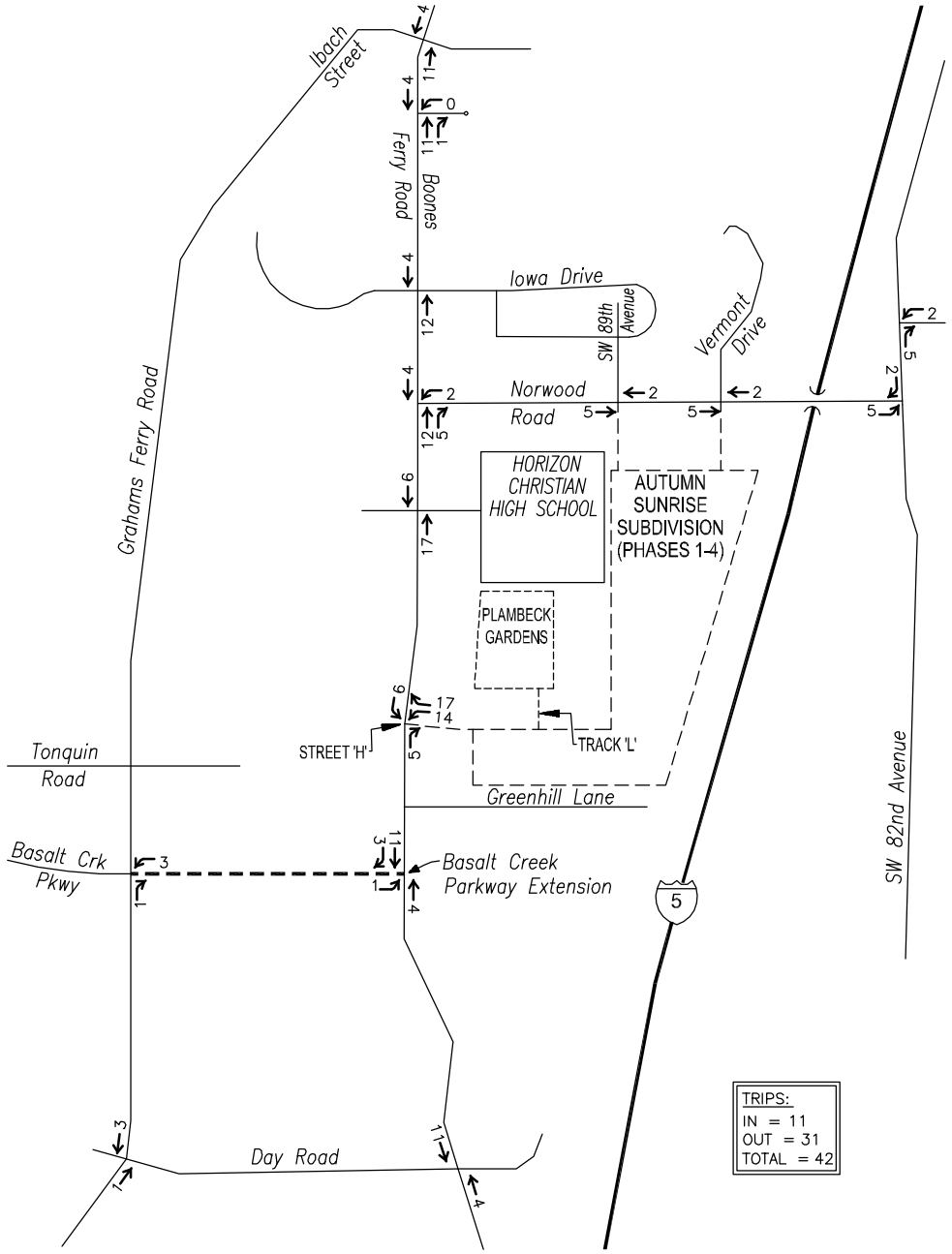
NOTES: The Plambeck Gardens site will take its access from the Autumn Sunrise access to Boones Ferry Road. Trip distribution for Plambeck Gardens is based on engineering judgment.

--- Basalt Creek Pkwy Ext. estimated completion is in Fall 2014.

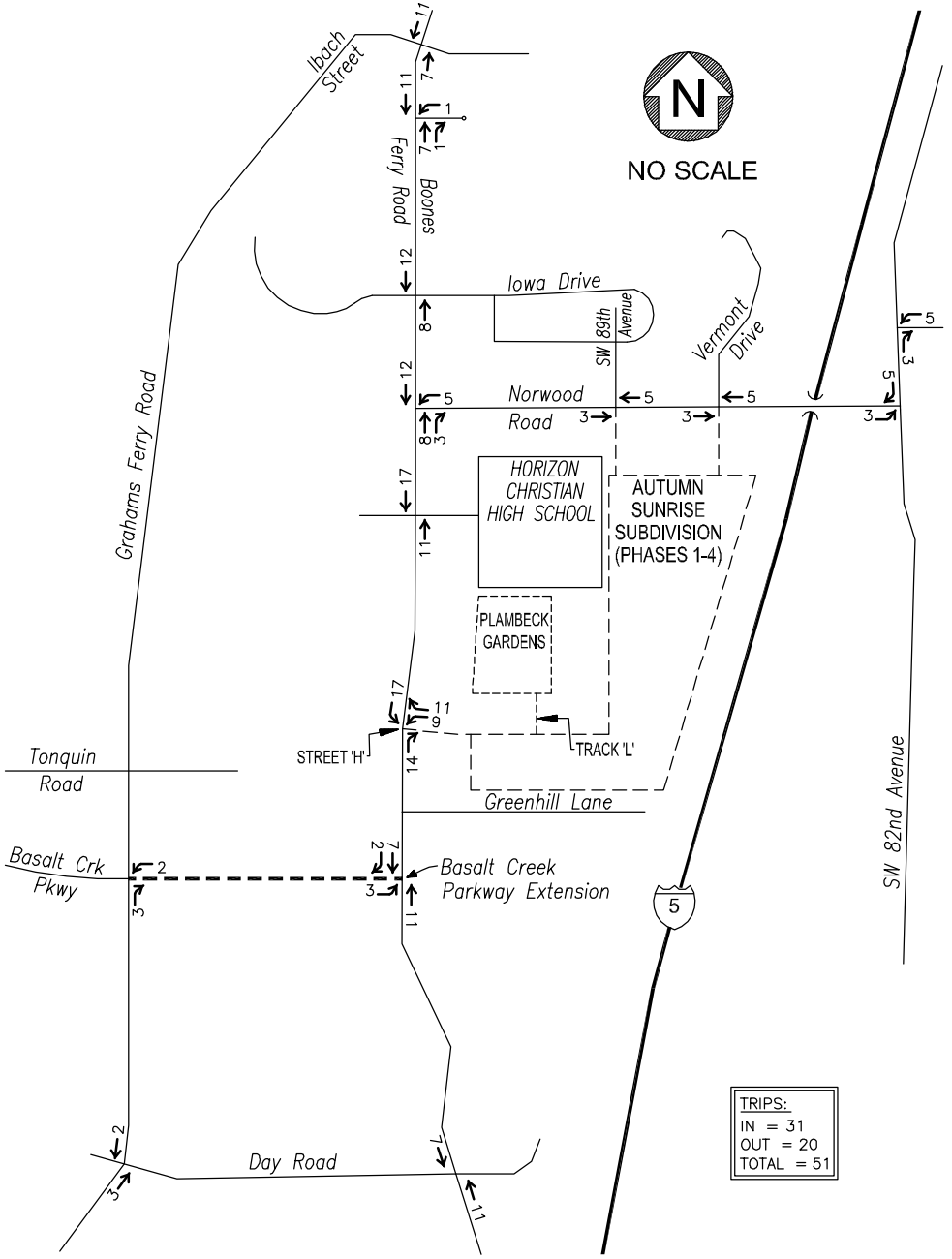
TRIP DISTRIBUTION
AM PEAK HOUR & PM PEAK HOUR
PLAMBECK GARDENS - CPAH

FIGURE 4

PLOT DATE: 01.25.22 FILE: 2114flow3.dwg



AM PEAK HOUR



PM PEAK HOUR

CHARBONNEAU ENGINEERING LLC

PROJECT: 21-14

NOTES: Plambeck Gardens' trip generation was calculated with Mid-Rise Housing (ITE 221) trip rates.

- - - Basalt Creek Pkwy Extension estimated completion is in Fall 2014.

TRIP ASSIGNMENT

PLAMBECK GARDENS - CPAH

FIGURE 5

Appendix C - Safety

Crash History Data

Sight Distance

Left-Turn Lane Warrant Analysis

Preliminary Signal Warrant Analysis

Detailed Signal Warrant Analysis

URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

BOONES FERRY RD and IBACH ST, City of Tualatin, Washington County, 01/01/2016 to 12/31/2020

1 - 2 of 9 Crash records shown.

SER# INVEST RD DPT UNLOC?	S D M P R J S W E A U I C O E L G N H R D C S V L K	DATE DAY TIME LAT	CLASS DIST FROM LONG	CITY STREET FIRST STREET SECOND STREET LRS	RD CHAR DIRECT LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH COLL SVRTY	SPCL USE TRLR QTY OWNER V# TYPE	MOVE FROM TO	PRTC P# TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
02244	N N N # N N Error	04/19/2017	16	SW BOONES FERRY RD	INTER	CROSS	N	N	RAIN	S-1TURN	01 NONE 0	STRGHT									07
CITY		WE	0	SW IBACH ST	N		TRF SIGNAL	N	WET	REAR	PRVTE	N -S								000	00
N N		11A 45 21 38.63	-122 46 28.26		06	0		N	DAY	INJ	PSNGR CAR		01 DRVR	INJC	42	F	OR-Y OR<25		043	000	07
	# Error										02 NONE 0	TURN-R									
											PRVTE	N -W								000	00
											PSNGR CAR		01 DRVR	INJC	58	M	OR-Y OR<25		000	000	00
06988	N N N # N N Error	10/13/2016	16	SW BOONES FERRY RD	INTER	CROSS	N	N	RAIN	ANGL-OTH	01 NONE 9	STRGHT									02
CITY		TH	0	SW IBACH ST	S		TRF SIGNAL	N	WET	TURN	N/A	N -S								000	00
N N		7P 45 21 38.63	-122 46 28.26		05	0		N	DLIT	PDO	PSNGR CAR		01 DRVR	NONE	00	Unk	UNK UNK		000	000	00
	# Error										02 NONE 9	TURN-R									
											N/A	W -S								000	00
											PSNGR CAR		01 DRVR	NONE	00	Unk	UNK UNK		000	000	00
02506	N N N # N N Error	05/01/2017	16	SW BOONES FERRY RD	STRGHT		N	N	CLD	S-1STOP	01 NONE 0	STRGHT									27,29
CITY		MO	50	SW IBACH ST	N	(NONE)	TRF SIGNAL	N	DRY	REAR	PRVTE	N -S								000	00
N N		3P 45 21 39.38	-122 46 27.77		06	(02)		N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	17	F	OR-Y OR<25		016,026	038	27,29

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L C	M J U G S	S I N V	W C H L	O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR TYPE / OWNER	QTY	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
				#Error												02	NONE	0	STOP											
																	PRVTE PSNGR	CAR	N -S	01	DRVR	INJC	32	F	OR-Y OR<25		000	011 000		00 00
04137	Y	N	N	#Error	N	N	11/11/2020	16	SW BOONES FERRY RD	STRGHT		N	Y	RAIN	FIX OBJ	01	NONE	0	STRGHT										040,045,010	01
CITY					WE	325		SW IBACH ST	N	(NONE)	UNKNOWN	N	WET	FIX		PRVTE		N -S									000	040,045,010	00
Y					11P				07			N	DLIT	INJ		PSNGR	CAR		01	DRVR	INJB	42	M	OTH-Y		047,080,081	017		01
N					45 21 41.75	-122 46 26.21				(02)															OR>25					
02310	N	Y	N	#Error	N	N	04/08/2016	16	SW BOONES FERRY RD	STRGHT		N	Y	CLR	FIX OBJ	01	NONE	9	STRGHT										040	10
CITY					FR	500		SW IBACH ST	N	(NONE)	UNKNOWN	N	DRY	FIX		N/A		N -S									000		00
Y					1A				08			N	DARK	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N					45 21 43.41	-122 46 25.13				(02)															UNK					
02457	N	N	N	#Error			05/15/2018	16	SW BOONES FERRY RD	STRGHT		N	N	CLR	S-STRGHT	01	NONE	9	STRGHT											29
NONE					TU	150		SW IBACH ST	S	(NONE)	UNKNOWN	N	DRY	REAR		N/A		N -S									000		00
N					1P				07			N	DAY	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N					45 21 36.89	-122 46 28.91				(02)															UNK					
				#Error												02	NONE	9	STRGHT											
																	N/A		N -S									006		00
																	PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					

Not associated with intersection

Not associated with intersection

SER# / INVEST RD DPT UNLOC?	S P E D	D R A C	M J U G	S I N S	W C H V	O R L	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
05111	N	N	N	# Error			09/27/2018	16	SW BOONES FERRY RD	STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT											29
NONE							TH	270	SW IBACH ST	S	(NONE)	UNKNOWN	N	DRY	REAR		N/A	S -N									000		00
N							6A			08			N	DAWN	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 35.73	-122 46 29.03			(02)													UNK					
				# Error												02	NONE 9	STRGHT											
																	N/A	S -N									006		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
03140	N	N	N	# Error			04/19/2019	16	SW BOONES FERRY RD	STRGHT		N	Y	CLR	PRKD MV	01	NONE 9	PARKNG											10
							Not associated with intersection																						
NONE							FR	500	SW IBACH ST	S	(NONE)	UNKNOWN	N	DRY	PARK		N/A	N -S									008		00
Y							7A			07			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 33.52	-122 46 29.05			(02)													UNK					
				# Error												02	NONE 9	PRKD-P											
																	N/A	N -S									008		00
																	PSNGR CAR												
84439	N	N	N	# Error			10/24/2017	16	SW BOONES FERRY RD	STRGHT		N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
							Not associated with intersection																						
NONE							TU	600	SW IBACH ST	S	(NONE)	UNKNOWN	N	DRY	REAR		N/A	S -N									000		00
N							3P			08			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 32.82	-122 46 29.05			(02)													UNK					

CITY OF TUALATIN, WASHINGTON COUNTY

BOONES FERRY RD and IBACH ST, City of Tualatin, Washington County, 01/01/2016 to 12/31/2020

9 - 9 of 9 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D (SPECL)	D R A L C (DRAC)	M J U G S (MJUGS)	S I N V (SINV)	W C H L (WCHL)	D O R K (DORK)	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	SPCL USE / TRLR QTY / OWNER / V# TYPE	MOVE / FROM / TO	P# TYPE (PRTC)	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
			# E r r o r													02 NONE 9	STOP									
																N/A	S -N								011	00
																PSNGR CAR		01 DRVR	NONE	00	Unk	UNK UNK		000	000	00

CITY OF TUALATIN, WASHINGTON COUNTY **BOONES FERRY RD and IBACH CT, City of Tualatin, Washington County, 01/01/2016 to 12/31/2020**

1 - 3 of 7 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	SP / E / D	A	L	DR / G / C	U / N / S	J / I / V	S / C / H	W / O / L	R / K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AG	SEX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
07632	Y	N	N	# Error	N	N	11/06/2016			16	SW BOONES FERRY RD	INTER	CROSS	N	Y	CLD	FIX OBJ	01	NONE 0	TURN-L										054	08,30
CITY							SU			0	SW IBACH CT	S		TRF SIGNAL	N	WET	FIX		PRVTE	E -S								000	054	00
N N							12A 45 21 38.63			-122 46 28.26		05	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJB	16	M	OR-Y OR<25		001,050	000		08,30
04369	N	N	N	# Error	N	N	08/22/2018			16	SW BOONES FERRY RD	INTER	CROSS	N	N	SMOK	S-1STOP	01	NONE 0	STRGHT											27,07
CITY							WE			0	SW IBACH CT	S		TRF SIGNAL	N	DRY	REAR		PRVTE	S -N								000		00
N N							8A 45 21 38.63			-122 46 28.26		06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	20	F	OR-Y OR<25		016,043	038		27,07
				# Error														02	NONE 0	STOP											
																			PRVTE PSNGR CAR	S -N	01	DRVR	INJC	29	F	OR-Y OR<25		011 000		00 00
05938	N	N	N	# Error			09/25/2017			16	SW BOONES FERRY RD	INTER	CROSS	N	N	CLR	PED	01	NONE 0	TURN-L											02
CITY							MO			0	SW IBACH CT	W		TRF SIGNAL	N	DRY	PED		PRVTE	S -W								000		00
N N							7P 45 21 38.63			-122 46 28.26		05	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y OR<25		029	000		02
				# Error																- STRGHT N S	01	PED	INJC	19	M		I	XWLK 000	035		00

SER# / INVEST / RD DPT / UNLOC?	S P E D	D E A C	M A L S	R U G V	J I N L	S C H K	W O R	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02020	N	N	N	# Error	Y			04/10/2017	16	SW BOONES FERRY RD	ALLEY		N	N	CLD	O-1 L-TURN	01	NONE 9	STRGHT										02
									Not associated with intersection																				
CITY								MO	350	SW IBACH CT	S	(NONE)	NONE	N	WET	TURN		N/A	S -N								000		00
N								1P			08			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 21 34.92	-122 46 29.03			(02)													UNK					
				# Error													02	NONE 9	TURN-L											
																		N/A	N -E									019		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
07712	N	N	N	# Error	N	N		12/04/2017	19	SW IBACH CT	STRGHT		N	Y	CLD	FIX OBJ	01	NONE 9	STRGHT										054	10
									Not associated with intersection																				
CITY								MO	140	SW BOONES FERRY RD	E	(NONE)	NONE	N	DRY	FIX		N/A	UN-UN								000		00
Y								3P			07			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 21 37.99	-122 46 26.08			(02)													UNK					
03331	N	N	N	# Error	N	N		05/11/2018	16	SW BOONES FERRY RD	STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
CITY								FR	100	SW IBACH CT	S	(NONE)	NONE	N	DRY	REAR		UNKN	S -N								000		00
N								7A			08			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		026	000		29
N								45 21 37.29	-122 46 28.82			(02)													UNK					
				# Error													02	NONE 0	STOP											
																		PRVTE	S -N									011		00
																		PSNGR CAR		01	DRVR	INJC	47	F	NONE OR<25		000	000		00

SER# / INVEST RD DPT / UNLOC?	SP / E / D	A / L / C	U / G / S	M / J / I / N / V	S / C / H / L	W / O / R / K	DATE / DAY / TIME / LAT	CLASS / DIST FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
				# Error												02	NONE 0	STOP											
																	PRVTE	S -N									011		00
																	PSNGR CAR		02	PSNG	INJC	36	F			000	000		00
00397	N	N	N	# Error			01/23/2019	16	SW BOONES FERRY RD	STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE							WE	400	SW IBACH CT	S	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE	S -N									000		00
N							3P			08			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	25	M	OR-Y		026	000		29
N							45 21 34.42	-122 46 29.03			(02)													OR>25					
				# Error												02	NONE 0	STOP											
																	PRVTE	S -N									011		00
																	PSNGR CAR		01	DRVR	INJC	16	F	OR-Y OR<25		000	000		00
				# Error												02	NONE 0	STOP											
																	PRVTE	S -N									011		00
																	PSNGR CAR		02	PSNG	INJC	14	F			000	000		00

Not associated with intersection

CITY OF TUALATIN, WASHINGTON COUNTY **BOONES FERRY RD and NORWOOD RD, City of Tualatin, Washington County, 01/01/2016 to 12/31/2020**

6 - 8 of 9 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L C	M J U G S	S I N V	W C H L	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
				# Error											02	NONE 9	STOP											
																N/A	N -S									011		00
																PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
06351	N	N N	# Error		10/11/2017	16	SW BOONES FERRY RD	STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT												29
NONE					WE	100	SW NORWOOD RD	S	(NONE)	UNKNOWN	N	WET	REAR		PRVTE	S -N										000		00
N					7A			08			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	25	F	OR-Y		026	000		29
N					45 21 12.05	-122 46 29.05			(02)													OR<25					
			# Error											02	NONE 0	STOP											
															PRVTE	S -N									011		00
															PSNGR CAR		01	DRVR	INJC	47	F	OR-Y OR<25		000	000		00
			# Error											02	NONE 0	STOP											
															PRVTE	S -N									011		00
															PSNGR CAR		02	PSNG	INJC	16	F			000	000		00
00560	N	Y N	# Error		01/27/2020	16	SW BOONES FERRY RD	STRGHT		N	Y	CLR	FIX OBJ	01	NONE 0	STRGHT											053,121	10
NO RPT					MO	410	SW NORWOOD RD	S	(NONE)	UNKNOWN	N	WET	FIX		PRVTE	S -N										000	053,121	00
Y					2A			00			N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	48	M	OR-Y		081	000		10
N					45 21 9.07	-122 46 29.02			(02)													OR<25					

Not associated with intersection

CITY OF TUALATIN, WASHINGTON COUNTY **BOONES FERRY RD and NORWOOD RD, City of Tualatin, Washington County, 01/01/2016 to 12/31/2020**

1 - 3 of 9 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A C	M J U S	S I G V	W C N L	O H K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
05132	Y	N	N	# Error	N	N	08/02/2016	16	SW BOONES FERRY RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 9	TURN-R											08,30
CITY							TU	0	SW NORWOOD RD	E		STOP SIGN	N	DRY	TURN		N/A	S -E									000		00
N							12P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 13.25	-122 46 29.07																UNK					
				# Error												02	NONE 9	STRGHT											
																	N/A	E -W									006		00
																	SEMI TOW		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
08636	N	N	N	# Error			12/14/2016	16	SW BOONES FERRY RD	INTER	3-LEG	N	N	SNOW	O-OTHER	01	NONE 9	TURN-L										124	02
NONE							WE	0	SW NORWOOD RD	E		STOP SIGN	N	ICE	TURN		N/A	N -E									000		00
N							6P			05	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 13.25	-122 46 29.07																UNK					
				# Error												02	NONE 9	TURN-R											
																	N/A	S -E									000		00
																	TRUCK		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
03180	Y	N	N	# Error	N	N	05/31/2017	16	SW BOONES FERRY RD	INTER	3-LEG	N	Y	CLD	FIX OBJ	01	NONE 9	TURN-L										053	01
CITY							WE	0	SW NORWOOD RD	E		STOP SIGN	N	DRY	FIX		N/A	N -E									000		00
N							3P			05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 13.25	-122 46 29.07																UNK					

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A C	M J U S	S I G V	W C N L	O H K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04147	Y	Y	N	# Error	N	N	11/11/2020	16	SW BOONES FERRY RD	INTER	3-LEG	N	N	CLR	ANGL-STP	01	NONE 9	TURN-R											30,08
CITY							WE	0	SW NORWOOD RD	E		UNKNOWN	N	DRY	TURN		N/A	S -E									000		00
N							1P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 13.25	-122 46 29.07																UNK					
				# Error												02	NONE 9	STOP											
																	N/A	E -W									011		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
04164	N	N	N	# Error			11/13/2020	16	SW BOONES FERRY RD	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT											02,03
NONE							FR	0	SW NORWOOD RD	CN		STOP SIGN	N	WET	TURN		N/A	S -N									000		00
N							6A			02	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 13.25	-122 46 29.07																UNK					
				# Error												02	NONE 9	TURN-L											
																	N/A	E -S									000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
05839	N	N	N	# Error			10/29/2018	16	SW BOONES FERRY RD	STRGHT		N	N	CLD	S-1STOP	01	NONE 9	STRGHT											29
NONE							MO	115	SW NORWOOD RD	N	(NONE)	UNKNOWN	N	WET	REAR		N/A	N -S									000		00
N							3P			08			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 14.61	-122 46 29.08			(02)													UNK					

CITY OF TUALATIN, WASHINGTON COUNTY **BOONES FERRY RD and NORWOOD RD, City of Tualatin, Washington County, 01/01/2016 to 12/31/2020**

9 - 9 of 9 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L C	M J U G S	S I N V	W C H L	O R K N	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
06392	N	N	N	# Error	N	N	11/21/2018	16	SW BOONES FERRY RD	STRGHT		N	Y	CLD	FIX OBJ	01	NONE 9	STRGHT										062,079	16
COUNTY							WE	1460	SW NORWOOD RD	S	(NONE)	UNKNOWN	N	DRY	FIX		N/A	S -N									000		00
Y							7A			08			N	DAWN	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 58.76	-122 46 29.43			(02)													UNK					

Not associated with intersection

82ND AVE and NORWOOD RD, City of Outside City Limits, Washington County, 01/01/2016 to 12/31/2020

SER# / INVEST / RD DPT / UNLOC?	S P E E D	A L C	D R U G	J U N S	S V C	W H L	M O R K	DATE / DAY / TIME / LAT	MILEPNT / DIST FROM / INTERSECT / LONG	COUNTY ROADS / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	SPCL USE / TRLR QTY / OWNER / V# TYPE	MOVE / FROM / TO	PRTC / P# TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED / LOC	ERROR	ACT	EVENT	CAUSE

WASHINGTON COUNTY

82ND AVE and NORWOOD RD, City of Outside City Limits, Washington County, 01/01/2016 to 12/31/2020

CITY OF WILSONVILLE, WASHINGTON COUNTY **DAY RD and BOONES FERRY FR, City of Wilsonville, Washington County, 01/01/2016 to 12/31/2020**

1 - 2 of 17 Crash records shown.

SER# / INVEST RD DPT / UNLOC?	S P E D	D R A C	M J U S	S I G V	W C N L	O H K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
82897	N	N	N	# Error			08/19/2018	16	SW BOONES FERRY FR	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NO RPT							SU	0	SW DAY RD	N		TRF SIGNAL	N	UNK	REAR		PRVTE	N -S									000		00
N							6P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y		026	000		29
N							45 20 25.31	-122 46 24.9																OR<25					
				# Error												02	NONE 0	STOP											
																	PRVTE	N -S									011		00
																	PSNGR CAR		01	DRVR	INJC	50	F	OR-Y		000	000		00
																								OR<25					
00405	N	N	N	# Error			01/16/2017	16	SW BOONES FERRY FR	INTER	CROSS	N	N	SNOW	S-1STOP	01	NONE 9	STRGHT										124	29
NONE							MO	0	SW DAY RD	S		TRF SIGNAL	N	ICE	REAR		N/A	S -N									000		00
N							UNK			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 25.3	-122 46 24.9																UNK					
				# Error												02	NONE 9	STOP											
																	N/A	S -N									011		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
80200	N	N	N	# Error			01/14/2017	16	SW BOONES FERRY FR	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
NONE							SA	0	SW DAY RD	W		TRF SIGNAL	N	ICE	REAR		N/A	W -E									000		00
N							10A			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 25.3	-122 46 24.9																UNK					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R U G S	M J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES / LOC	PED ERROR	ACT	EVENT	CAUSE
				# Error												02	NONE 9	STOP										
																	N/A	W -E								011		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK	000	000		00
81394	N	N	N	# Error			04/12/2017	16	SW BOONES FERRY FR	INTER	3-LEG	N	N	RAIN	S-OTHER	01	NONE 9	TURN-L										08
NONE							WE	0	SW DAY RD	W		TRF SIGNAL	N	WET	TURN		N/A	S -W								000		00
N N							8A 45 20 25.3	-122 46 24.9		05	0		N	DAY	PDO		SEMI TOW		01	DRVR	NONE	00	Unk	UNK UNK	000	000		00
				# Error												02	NONE 9	TURN-L										
																	N/A	S -W								000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK	000	000		00
82929	N	N	N	# Error			07/09/2020	16	SW BOONES FERRY FR	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NO RPT							TH	0	SW DAY RD	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W -E								000		00
N N							4P 45 20 25.31	-122 46 24.9		06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	41	M	OR-Y OR<25	026	000		29
				# Error												02	NONE 0	STOP										
																	PRVTE	W -E								011		00
																	PSNGR CAR		01	DRVR	INJC	40	M	OR-Y OR>25	000	000		00

CITY OF WILSONVILLE, WASHINGTON COUNTY **DAY RD and BOONES FERRY FR, City of Wilsonville, Washington County, 01/01/2016 to 12/31/2020**

6 - 7 of 17 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A C	M J U S	S W I C	O DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
82007	N	N	N	# Error	02/21/2019	16	SW BOONES FERRY FR	INTER	CROSS	N	N	UNK	ANGL-OTH	01	NONE 0	TURN-R										02
CITY					TH	0	SW DAY RD	CN		TRF SIGNAL	N	UNK	TURN		UNKN	W -S									000	00
N					5P			03	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	22	F	UNK		028	000	02
N					45 20 25.3	-122 46 24.92																UNK				
				# Error										02	NONE 0	STRGHT										
															PRVTE	N -S									000	00
															PSNGR CAR		01	DRVR	INJC	19	M	OR-Y OR>25	000	000	00
03857	N	N	N	# Error	10/18/2020	16	SW BOONES FERRY FR	ALLEY		N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L										02
NO RPT					SU	5	SW DAY RD	N	(NONE)	L-GRN-SIG	N	DRY	TURN		N/A	S -W									019	00
N					4P			05			Y	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
N					45 20 25.31	-122 46 24.91			(02)													UNK				
				# Error										02	NONE 9	STRGHT										
															N/A	N -S									000	00
															PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
02054	N	N	N	# Error	04/11/2017	16	SW BOONES FERRY FR	STRGHT		Y	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NO RPT					TU	50	SW DAY RD	N	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE	N -S									000	00
N					5P			06			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	22	M	OR-Y	014	000	29
N					45 20 26.27	-122 46 25.3			(03)													OR>25				

SER# / INVEST RD DPT / UNLOC?	S P E D	A L C	D R U G S	M J I N V	S C H L	W O R K	DATE / DAY / TIME	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
				# Error												02	NONE 0	STOP											
																	UNKN	N -S									011		00
																	PSNGR CAR		01	DRVR	INJC	58	M	OR-Y OR>25		000	000		00
04040	N	N	N	# Error			08/09/2019	16	SW BOONES FERRY FR	STRGHT		Y	N	CLR	S-1STOP	01	NONE 0	STRGHT										013	29
NO RPT							FR	70	SW DAY RD	N	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE	N -S									000		00
N							3P			08			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	46	F	OR-Y		026	000		29
N							45 20 26.4	-122 46 25.36			(03)													OR<25					
				# Error												02	NONE 0	STOP											
																	PRVTE	N -S									011	013	00
																	PSNGR CAR		01	DRVR	INJC	57	F	OR-Y OR<25		000	000		00
				# Error												02	NONE 0	STOP											
																	PRVTE	N -S									011	013	00
																	PSNGR CAR		02	PSNG	INJC	67	F			000	000		00
				# Error												03	NONE 0	STOP											
																	PRVTE	N -S									022		00
																	PSNGR CAR		01	DRVR	NONE	49	M	OR-Y OR>25		000	000		00
02987	N	N	N	# Error			06/12/2019	16	SW DAY RD	STRGHT		Y	N	CLR	S-STRGHT	01	NONE 9	STRGHT											29
NONE							WE	40	SW BOONES FERRY FR	W	(NONE)	UNKNOWN	N	DRY	REAR		N/A	W -E									000		00
N							5P			06			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 25.3	-122 46 26.24			(03)													UNK					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R U G S	M J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
				#Error												02	NONE 9	STRGHT										
																	N/A	W -E								006		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
01970	N	N	N	#Error			05/28/2020	16	SW DAY RD	STRGHT		N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
NONE							TH	52	SW BOONES FERRY FR	W	(NONE)	UNKNOWN	N	DRY	REAR		N/A	E -W								000		00
N							6A			07			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 25.29	-122 46 26.39			(02)													UNK					
				#Error												02	NONE 9	STOP										
																	N/A	E -W								011		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
84103	N	N	N	#Error			11/09/2018	16	SW DAY RD	STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT										013	29
NONE							FR	115	SW BOONES FERRY FR	W	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE	W -E								000		00
N							4P			08			N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	44	F	OR-Y		026	000		29
N							45 20 25.3	-122 46 26.51			(02)													OR<25					
				#Error												02	NONE 0	STOP										
																	PRVTE	W -E								011	013	00
																	PSNGR CAR		01	DRVR	NONE	24	M	OR-Y OR<25		000	000		00
				#Error												03	NONE 0	STOP										
																	PRVTE	W -E								022		00
																	PSNGR CAR		01	DRVR	INJC	47	F	OR-Y OR<25		000	000		00

CITY OF WILSONVILLE, WASHINGTON COUNTY **DAY RD and BOONES FERRY FR, City of Wilsonville, Washington County, 01/01/2016 to 12/31/2020**

13 - 14 of 17 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A C	M J U S	S I G V	W C N L	O H K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02539	N	N	N	# Error			07/16/2020	16	SW DAY RD	STRGHT		N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE							TH	150	SW BOONES FERRY FR	W	(NONE)	UNKNOWN	N	DRY	REAR		N/A	W -E									000		00
N							5P			08			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 25.29	-122 46 27.76			(02)													UNK					
				# Error												02	NONE 9	STOP											
																	N/A	W -E									011		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
84789	N	N	N	# Error			11/14/2017	16	SW DAY RD	STRGHT		N	N	CLR	S-1TURN	01	NONE 9	U-TURN											08
NONE							TU	200	SW BOONES FERRY FR	W	(NONE)	UNKNOWN	N	DRY	TURN		N/A	E -E									000		00
N							9P			08			N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 25.29	-122 46 27.7			(02)													UNK					
				# Error												02	NONE 9	STRGHT											
																	N/A	E -W									000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
01898	N	N	N	# Error			04/18/2018	16	SW DAY RD	STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT											29
NONE							WE	200	SW BOONES FERRY FR	W	(NONE)	UNKNOWN	N	DRY	REAR		N/A	W -E									000		00
N							8A			08			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 25.28	-122 46 28.45			(02)													UNK					

Not associated with intersection

CITY OF WILSONVILLE, WASHINGTON COUNTY **DAY RD and BOONES FERRY FR, City of Wilsonville, Washington County, 01/01/2016 to 12/31/2020**

15 - 17 of 17 Crash records shown.

SER# / INVEST RD DPT / UNLOC?	S P E D	A L C	D R U G S	M J I N V	S C H L	W O R K	DATE / DAY / TIME	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES / LOC	PED / ERROR	ACT	EVENT	CAUSE
				# Error												02	NONE 9	STRGHT										
																	N/A	W -E								000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK / UNK	000	000		00
01366	N	N	N	# Error	N	N	03/18/2019	16	SW DAY RD	STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
COUNTY							MO	675	SW BOONES FERRY FR	W	(NONE)	NONE	N	DRY	REAR		PRVTE	E -W								000		00
N							6A			07			N	DAWN	INJ		PSNGR CAR		01	DRVR	INJB	51	M	OR-Y	026	000		29
N							45 20 25.25	-122 46 35.09			(02)													OR<25				
				# Error												02	NONE 0	STOP										
																	PRVTE	E -W								011		00
																	TRUCK		01	DRVR	NONE	42	M	OR-Y / OR<25	000	000		00
02306	N	N	N	# Error			06/25/2020	16	SW BOONES FERRY FR	CURVE		N	Y	CLR	FIX OBJ	01	NONE 9	STRGHT									054	16
COUNTY							TH	355	SW DAY RD	N	(NONE)	UNKNOWN	N	DRY	FIX		N/A	S -N								088		00
Y							5P			07			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK / UNK	000	000		00
N							45 20 25.33	-122 46 24.92			(02)																	

Not associated with intersection

CITY OF WILSONVILLE, WASHINGTON COUNTY **DAY RD and BEAV-TUALATIN HY, City of Wilsonville, Washington County, 01/01/2016 to 12/31/2020**

1 - 2 of 14 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L C	M J U G S	S I N V	W C H L	O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
80420	N	N	N	# Error			02/04/2019	16	SW BEAV-TUALATIN HY	INTER	3-LEG	N	Y	RAIN	FIX OBJ	01	NONE 0	STRGHT										040,053,079	10
COUNTY							MO	0	SW DAY RD	E		TRF SIGNAL	N	WET	FIX		PRVTE	W -E									000	040,053,079	00
N							5A			05	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJA	42	M	OR-Y	081		000		10
N							45 20 25.31	-122 46 24.9																OR<25					
06703	N	N	N	# Error	N	N	10/04/2016	16	SW BEAV-TUALATIN HY	INTER	3-LEG	N	N	RAIN	O-STRGHT	01	NONE 0	STRGHT											26
COUNTY							TU		SW DAY RD	S		TRF SIGNAL	N	WET	HEAD		PRVTE	S -N									000		00
N							4P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	55	M	OR-Y	000		000		00
N							45 20 24.73	-122 46 24.67	014100100S00															OR<25					
				# Error												01	NONE 0	STRGHT											
																	PRVTE	S -N									000		00
																	PSNGR CAR		02	PSNG	INJC	54	F		000		000		00
				# Error												02	NONE 0	STRGHT											
																	PRVTE	N -S									007		00
																	PSNGR CAR		01	DRVR	NONE	45	M	OR-Y	000		000		26
																								OR<25					
83471	N	N	N	# Error			09/28/2018	16	SW BEAV-TUALATIN HY	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											10
NONE							FR	0	SW DAY RD	S		TRF SIGNAL	N	DRY	SS-O		N/A	S -N									000		00
N							4P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000		000		00
N							45 20 25.31	-122 46 24.92																UNK					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A C	D R U G S	M J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
				# Error												02	NONE 9	STOP										
																	N/A	S -N									011	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00
84151	N	N	N	# Error			11/20/2019	16	SW BEAV-TUALATIN HY	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE							WE	0	SW DAY RD	S		TRF SIGNAL	N	DRY	REAR		N/A	S -N									000	00
N							1P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 20 25.3	-122 46 24.91																UNK				
				# Error												02	NONE 9	STOP										
																	N/A	S -N									011	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00
82347	N	N	N	# Error			08/27/2020	16	SW BEAV-TUALATIN HY	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NO RPT							TH	0	SW DAY RD	S		TRF SIGNAL	N	DRY	REAR		N/A	S -N									000	00
N							8P			06	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 20 25.3	-122 46 24.9																UNK				
				# Error												02	NONE 9	STOP										
																	N/A	S -N									011	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00

CITY OF WILSONVILLE, WASHINGTON COUNTY **DAY RD and BEAV-TUALATIN HY, City of Wilsonville, Washington County, 01/01/2016 to 12/31/2020**

6 - 7 of 14 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L C	M J U G S	S I N V	W C H L	O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
83557	N	N	N	# Error			12/29/2020	16	SW BEAV-TUALATIN HY	INTER	3-LEG	N	N	CLR	O-1 L-TURN	01	NONE 9	STRGHT											02,08
NO RPT							TU	0	SW DAY RD	CN		TRF SIGNAL	N	DRY	TURN		N/A	N -S									000		00
N N							8A 45 20 25.3	-122 46 24.9		01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
				# Error												02	NONE 9	TURN-L											
																	N/A	S -W									000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
80963	N	N	N	# Error			03/16/2020	16	SW BEAV-TUALATIN HY	STRGHT		N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
NO RPT							MO		SW DAY RD	SE	(NONE)	NONE	N	DRY	REAR		N/A	S -N									000		00
N N							10A 45 20 24.73	-122 46 24.66	014100100S00	04	(03)		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
				# Error												02	NONE 9	STOP											
																	N/A	S -N									011		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
04914	N	N	N	# Error			07/26/2016	16	SW BEAV-TUALATIN HY	STRGHT		Y	N	CLR	S-1STOP	01	NONE 0	STRGHT										093	29
NONE							TU		SW DAY RD	S	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE	N -S									000		00
N N							4P 45 20 22.33	-122 46 23.77	014100100S00	04	(03)		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	27	M	OR-Y OR<25		026	000	093	29

SER# / INVEST RD DPT UNLOC?	S P E D	A L C	D R U G S	M J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
				# Error												02	NONE 0	STOP										
																	PRVTE	N -S								011		00
																	PSNGR CAR		01	DRVR	INJC	66	F	OR-Y OR<25	000	000		00
82705	N	N	N	# Error			06/15/2016	16	SW BEAV-TUALATIN HY	STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE							WE		SW DAY RD	S	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE	N -S								000		00
N							5P			03			N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	73	F	OR-Y	026	000		29
N							45 20 24.13	-122 46 24.43	014100100S00		(03)													OR<25				
				# Error												02	NONE 0	STOP										
																	PRVTE	N -S								011		00
																	PSNGR CAR		01	DRVR	NONE	00	F	OR-Y OR<25	000	000		00
				# Error												03	NONE 0	STRGHT										
																	PRVTE	N -S								000		00
																	PSNGR CAR		01	DRVR	NONE	46	F	OR-Y OR<25	000	000		00
06248	N	N	N	# Error			09/15/2016	16	SW BEAV-TUALATIN HY	STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT										27,29
NONE							TH		SW DAY RD	S	(NONE)	UNKNOWN	N	DRY	REAR		N/A	N -S								000		00
N							4P			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000		00
N							45 20 24.13	-122 46 24.43	014100100S00		(03)													UNK				
				# Error												02	NONE 9	STRGHT										
																	N/A	N -S								000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK	000	000		00

CITY OF WILSONVILLE, WASHINGTON COUNTY **DAY RD and BEAV-TUALATIN HY, City of Wilsonville, Washington County, 01/01/2016 to 12/31/2020**

11 - 12 of 14 Crash records shown.

SER# / INVEST RD DPT / UNLOC?	S P E D	D R A L C	M J U G S	S I N V	W C H L	O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
84776	N	N	N	# Error			12/26/2018	16	SW BEAV-TUALATIN HY	STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										013	29
NONE							WE		SW DAY RD	S	(NONE)	UNKNOWN	N	WET	REAR		PRVTE	N -S									000		00
N							5P			03			N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	48	F	OR-Y		026	000		29
N							45 20 24.15	-122 46 24.44	014100100S00		(04)													OR>25					
				# Error												02	NONE 0	STOP											
																	PRVTE	N -S									011	013	00
																	PSNGR CAR		01	DRVR	INJC	35	F	OR-Y		000	000		00
																								OR>25					
				# Error												03	NONE 0	STOP											
																	PRVTE	N -S									022		00
																	PSNGR CAR		01	DRVR	NONE	30	M	OR-Y		000	000		00
																								OR<25					
06093	N	N	N	# Error			11/20/2019	16	SW BEAV-TUALATIN HY	STRGHT		N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
NO RPT							WE		SW DAY RD	S	(NONE)	UNKNOWN	N	DRY	REAR		N/A	N -S									000		00
N							3P			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 23.53	-122 46 24.19	014100100S00		(03)													UNK					
				# Error												02	NONE 9	STOP											
																	N/A	N -S									011		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					

CITY OF WILSONVILLE, WASHINGTON COUNTY **DAY RD and BEAV-TUALATIN HY, City of Wilsonville, Washington County, 01/01/2016 to 12/31/2020**

13 - 14 of 14 Crash records shown.

SER# / INVEST RD DPT / UNLOC?	S P E D	D R A C	M J U S	S I G V	W C N L	O H K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
81444	N	N	N	# Error			06/02/2020	16	SW BEAV-TUALATIN HY	STRGHT		Y	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE							TU		SW DAY RD	S	(NONE)	NONE	N	DRY	REAR		PRVTE	S -N									000		00
N							3P			05			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	20	M	OR-Y		026	000		29
N							45 20 24.14	-122 46 24.45	014100100S00		(03)													OR<25					
				# Error												02	NONE 0	STOP											
																	PRVTE	S -N									011		00
																	PSNGR CAR		01	DRVR	INJC	26	F	OR-Y		000	000		00
																								OR<25					
81394	N	N	N	# Error			05/01/2019	16	SW DAY RD	TRANS		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT											02
NO RPT							WE	445	SW BEAV-TUALATIN HY	W	(NONE)	NONE	N	DRY	SS-O		N/A	E -W									052		00
N							3P			07			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 25.27	-122 46 31.19			(02)													UNK					
				# Error												02	NONE 9	STRGHT											
																	N/A	E -W									000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					

Stopping Sight Distance

Travel Speed	50	mph
Reaction Time	2.5	seconds
Acceleration	11.2	ft/sec^2
Grade (percent)	0.00%	
SSD	**425**	**feet**

Reaction Distance

Travel Speed	50	mph
Travel Speed	73.5	fps
Reaction Time	2.5	seconds
Reaction Distance	**183.8**	**feet**

Braking Distance

Travel Speed	50	mph
Acceleration	11.2	ft/sec^2
Grade (percent)	0.00%	
Braking Distance	**239.6**	**feet**

Note: If grades are less than 3%, no adjustment is needed.

Intersection Sight Distance

	Left Turn Looking Left		*Left Turn Looking Right*		*Right Turn Looking Left*	
Approach Speed	50	mph	50	mph	50	mph
Number of Lanes	2	lanes	2	lanes		
Vehicle Type (P/S/C)	P	Passenger Car	P	Passenger Car	P	Passenger Car
Extra Crossing Lanes	0		0			
Time Gap	7.5	seconds	7.5	seconds	6.5	seconds
Intersection Sight Distance	555	feet	555	feet	480	feet
Washington County	**500**	**feet**	**500**	**feet**	**500**	**feet**

Notes:

1) For Approach speed, use the design speed of the roadway (typically 85th percentile speed).
2) For Time Gap, use 7.5 seconds for passenger cars, 9.5 seconds for single-unit trucks, and 11.5 seconds for combination trucks.
3) The above values are for 2-lane highways without medians and grades of 3 percent or less.
4) For grades in excess of 3 percent on the minor street, add .2 seconds for each percent grade.
5) For additional lanes, add 0.5 seconds per lane for passenger cars and 0.7 seconds per lane for trucks.

Left-Turn Lane Warrant Analysis

Project: 22172 - Norwood Apartments
Intersection: Site Access on Norwood
Date: 2/2/2023
Scenario: 2026 Buildout - AM Peak Hour - No BCP Extension

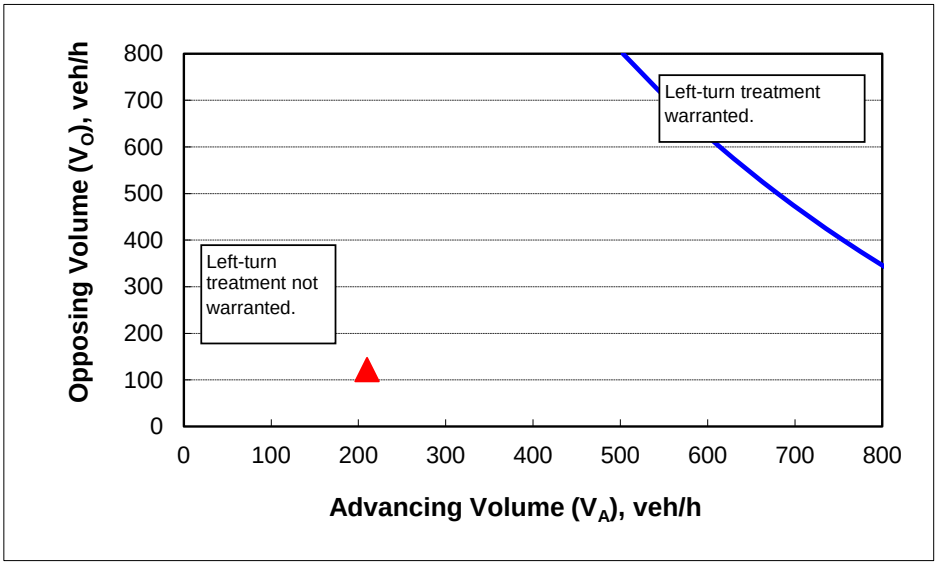
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	2%
Left turns in advancing volume (V_A), veh/h:	4
Advancing volume (V_A), veh/h:	210
Opposing volume (V_O), veh/h:	122

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1028
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: 22172 - Norwood Apartments
Intersection: Site Access on Norwood
Date: 2/2/2023
Scenario: 2026 Buildout - PM Peak Hour - No BCP Extension

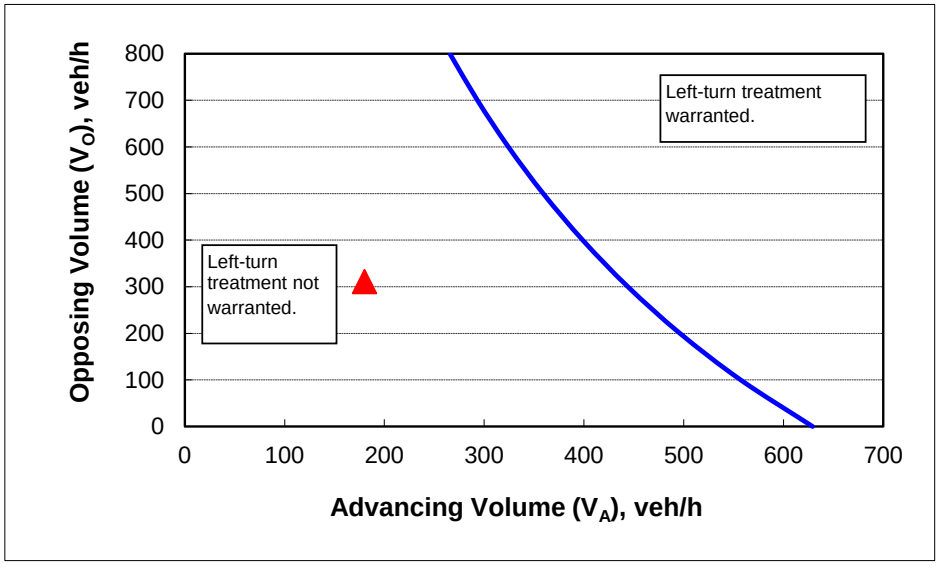
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	7%
Left turns in advancing volume (V_A), veh/h:	13
Advancing volume (V_A), veh/h:	180
Opposing volume (V_O), veh/h:	311

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	439
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: 22172 - Norwood Apartments
Intersection: Site Access on Norwood
Date: 2/2/2023
Scenario: 2026 Buildout - AM Peak Hour - With BCP Extension

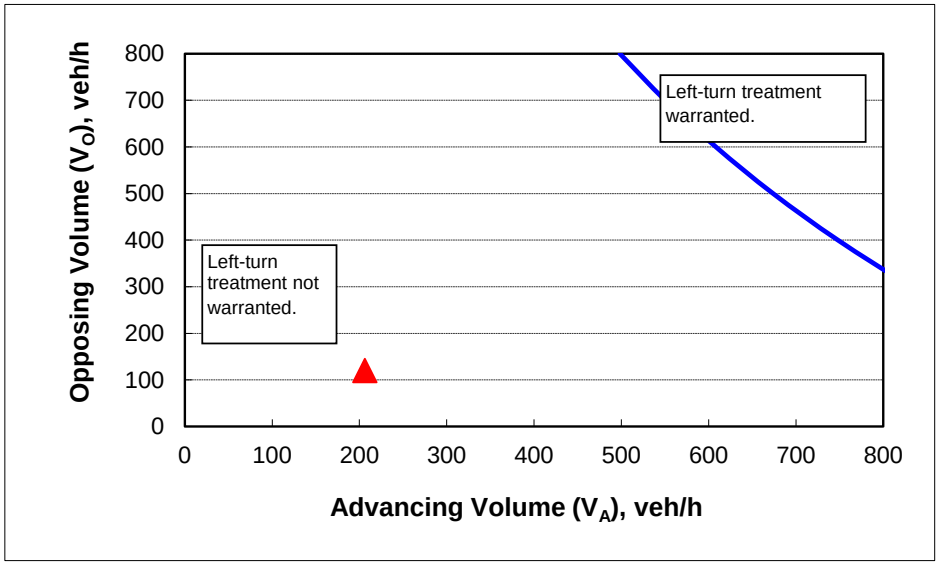
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	2%
Left turns in advancing volume (V_A), veh/h:	4
Advancing volume (V_A), veh/h:	206
Opposing volume (V_O), veh/h:	120

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1021
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: 22172 - Norwood Apartments
Intersection: Site Access on Norwood
Date: 2/2/2023
Scenario: 2026 Buildout - PM Peak Hour - With BCP Extension

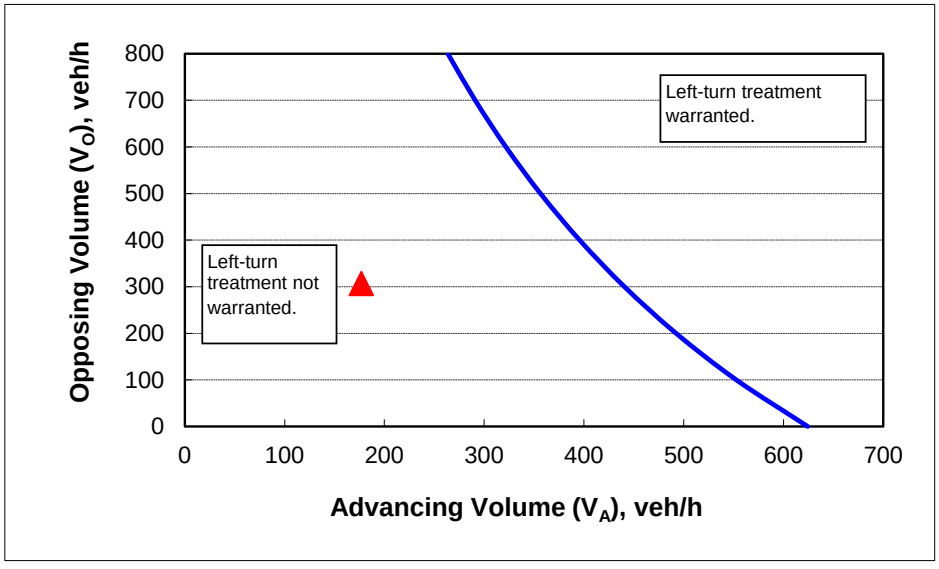
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	7%
Left turns in advancing volume (V_A), veh/h:	13
Advancing volume (V_A), veh/h:	177
Opposing volume (V_O), veh/h:	307

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	437
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Preliminary Traffic Signal Warrant Analysis

Project: 22172 - Norwood Apartments
Date: 2/2/2023
Scenario: 2026 Buildout - AM Peak Hour - No BCP Extension - Shared Left-Right

Major Street:	SW Boones Ferry Road	Minor Street:	Norwood Road	
Number of Lanes:	1	Number of Lanes:	1	
AM Peak Hour Volumes:	874	AM Peak Hour Volumes:	274	Total
			169	Rights
			50%	RT Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	8,740	6,200	
Minor Street*	1,900	1,850	**Yes**
Condition B: Interruption of Continuous Traffic			
Major Street	8,740	9,300	
Minor Street*	1,900	950	**No**
Combination Warrant			
Major Street	8,740	7,440	
Minor Street*	1,900	1,480	**Yes**

* Minor street right-turning traffic volumes reduced by 50%.

Preliminary Traffic Signal Warrant Analysis

Project: 22172 - Norwood Apartments
Date: 2/2/2023
Scenario: 2026 Buildout - PM Peak Hour - No BCP Extension - Shared Left-Right

Major Street:	SW Boones Ferry Road	Minor Street:	Norwood Road	
Number of Lanes:	1	Number of Lanes:	1	
PM Peak Hour Volumes:	1498	PM Peak Hour Volumes:	209	Total
			140	Rights
			50%	RT Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	14,980	6,200	
Minor Street*	1,390	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	14,980	9,300	
Minor Street*	1,390	950	**Yes**
Combination Warrant			
Major Street	14,980	7,440	
Minor Street*	1,390	1,480	**No**

* Minor street right-turning traffic volumes reduced by 50%.

Preliminary Traffic Signal Warrant Analysis

Project: 22172 - Norwood Apartments
Date: 2/2/2023
Scenario: 2026 Buildout - AM Peak Hour - With BCP Extension - Shared Left-Right

Major Street:	SW Boones Ferry Road		Minor Street:	Norwood Road	
Number of Lanes:	1		Number of Lanes:	1	
AM Peak Hour Volumes:	1016		AM Peak Hour Volumes:	271	Total
				157	Rights
				50%	RT Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	10,160	6,200	
Minor Street*	1,930	1,850	**Yes**
Condition B: Interruption of Continuous Traffic			
Major Street	10,160	9,300	
Minor Street*	1,930	950	**Yes**
Combination Warrant			
Major Street	10,160	7,440	
Minor Street*	1,930	1,480	**Yes**

* Minor street right-turning traffic volumes reduced by 50%.

Preliminary Traffic Signal Warrant Analysis

Project: 22172 - Norwood Apartments
Date: 2/2/2023
Scenario: 2026 Buildout - PM Peak Hour - With BCP Extension - Shared Left-Right

Major Street:	SW Boones Ferry Road	Minor Street:	Norwood Road	
Number of Lanes:	1	Number of Lanes:	1	
PM Peak Hour Volumes:	1543	PM Peak Hour Volumes:	206	Total
			131	Rights
			50%	RT Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	15,430	6,200	
Minor Street*	1,410	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	15,430	9,300	
Minor Street*	1,410	950	**Yes**
Combination Warrant			
Major Street	15,430	7,440	
Minor Street*	1,410	1,480	**No**

* Minor street right-turning traffic volumes reduced by 50%.

Preliminary Traffic Signal Warrant Analysis

Project: 22172 - Norwood Apartments
Date: 2/2/2023
Scenario: 2026 Buildout - AM Peak Hour - No BCP Extension - Separate Right-Turn Lane

Major Street:	SW Boones Ferry Road		Minor Street:	Norwood Road	
Number of Lanes:	1		Number of Lanes:	1	
AM Peak Hour Volumes:	874		AM Peak Hour Volumes:	274	Total
				169	Rights
				100%	RT Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	8,740	6,200	
Minor Street*	1,050	1,850	No
Condition B: Interruption of Continuous Traffic			
Major Street	8,740	9,300	
Minor Street*	1,050	950	No
Combination Warrant			
Major Street	8,740	7,440	
Minor Street*	1,050	1,480	No

* Minor street right-turning traffic volumes reduced by 100%.

Preliminary Traffic Signal Warrant Analysis

Project: 22172 - Norwood Apartments
Date: 2/2/2023
Scenario: 2026 Buildout - PM Peak Hour - No BCP Extension - Separate Right-Turn Lane

Major Street:	SW Boones Ferry Road		Minor Street:	Norwood Road	
Number of Lanes:	1		Number of Lanes:	1	
PM Peak Hour Volumes:	1498		PM Peak Hour Volumes:	209	Total
				140	Rights
				100%	RT Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	14,980	6,200	
Minor Street*	690	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	14,980	9,300	
Minor Street*	690	950	**No**
Combination Warrant			
Major Street	14,980	7,440	
Minor Street*	690	1,480	**No**

* Minor street right-turning traffic volumes reduced by 100%.

Preliminary Traffic Signal Warrant Analysis

Project: 22172 - Norwood Apartments
Date: 2/2/2023
Scenario: 2026 Buildout - AM Peak Hour - With BCP Extension - Separate Right-Turn Lane

Major Street:	SW Boones Ferry Road		Minor Street:	Norwood Road	
Number of Lanes:	1		Number of Lanes:	1	
AM Peak Hour Volumes:	1016		AM Peak Hour Volumes:	271	Total
				157	Rights
				100%	RT Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	10,160	6,200	
Minor Street*	1,140	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	10,160	9,300	
Minor Street*	1,140	950	**Yes**
Combination Warrant			
Major Street	10,160	7,440	
Minor Street*	1,140	1,480	**No**

* Minor street right-turning traffic volumes reduced by 100%.

Preliminary Traffic Signal Warrant Analysis

Project: 22172 - Norwood Apartments
Date: 2/2/2023
Scenario: 2026 Buildout - PM Peak Hour - With BCP Extension - Separate Right-Turn Lane

Major Street:	SW Boones Ferry Road		Minor Street:	Norwood Road	
Number of Lanes:	1		Number of Lanes:	1	
PM Peak Hour Volumes:	1543		PM Peak Hour Volumes:	206	Total
				131	Rights
				100%	RT Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	15,430	6,200	
Minor Street*	750	1,850	No
Condition B: Interruption of Continuous Traffic			
Major Street	15,430	9,300	
Minor Street*	750	950	No
Combination Warrant			
Major Street	15,430	7,440	
Minor Street*	750	1,480	No

* Minor street right-turning traffic volumes reduced by 100%.

Preliminary Traffic Signal Warrant Analysis

Project: 22172 - Norwood Apartments
Date: 2/2/2023
Scenario: 2026 Buildout - AM Peak Hour - No BCP Extension

Major Street:	Norwood Road		Minor Street:	Site Access	
Number of Lanes:	1		Number of Lanes:	1	
AM Peak Hour Volumes:	338		AM Peak Hour Volumes:	82	Total
				12	Rights
				0%	RT Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	3,380	6,200	
Minor Street*	820	1,850	No
Condition B: Interruption of Continuous Traffic			
Major Street	3,380	9,300	
Minor Street*	820	950	No
Combination Warrant			
Major Street	3,380	7,440	
Minor Street*	820	1,480	No

* Minor street right-turning traffic volumes reduced by 00%.

Preliminary Traffic Signal Warrant Analysis

Project: 22172 - Norwood Apartments
Date: 2/2/2023
Scenario: 2026 Buildout - PM Peak Hour - No BCP Extension

Major Street:	Norwood Road	Minor Street:	Site Access	
Number of Lanes:	1	Number of Lanes:	1	
PM Peak Hour Volumes:	491	PM Peak Hour Volumes:	51	Total
			8	Rights
			0%	RT Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	4,910	6,200	
Minor Street*	510	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	4,910	9,300	
Minor Street*	510	950	**No**
Combination Warrant			
Major Street	4,910	7,440	
Minor Street*	510	1,480	**No**

* Minor street right-turning traffic volumes reduced by 00%.

Preliminary Traffic Signal Warrant Analysis

Project: 22172 - Norwood Apartments
Date: 2/2/2023
Scenario: 2026 Buildout - AM Peak Hour - With BCP Extension

Major Street:	Norwood Road		Minor Street:	Site Access	
Number of Lanes:	1		Number of Lanes:	1	
AM Peak Hour Volumes:	326		AM Peak Hour Volumes:	82	Total
				12	Rights
				0%	RT Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	3,260	6,200	
Minor Street*	820	1,850	No
Condition B: Interruption of Continuous Traffic			
Major Street	3,260	9,300	
Minor Street*	820	950	No
Combination Warrant			
Major Street	3,260	7,440	
Minor Street*	820	1,480	No

* Minor street right-turning traffic volumes reduced by 00%.

Preliminary Traffic Signal Warrant Analysis

Project: 22172 - Norwood Apartments
Date: 2/2/2023
Scenario: 2026 Buildout - PM Peak Hour - With BCP Extension

Major Street:	Norwood Road		Minor Street:	Site Access	
Number of Lanes:	1		Number of Lanes:	1	
PM Peak Hour Volumes:	484		PM Peak Hour Volumes:	51	Total
				8	Rights
				0%	RT Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	4,840	6,200	
Minor Street*	510	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	4,840	9,300	
Minor Street*	510	950	**No**
Combination Warrant			
Major Street	4,840	7,440	
Minor Street*	510	1,480	**No**

* Minor street right-turning traffic volumes reduced by 00%.

Preliminary Traffic Signal Warrant Analysis

Project: 22172 - Norwood Apartments
Date: 2/2/2023
Scenario: 2026 Buildout - AM Peak Hour - No BCP Extension

Major Street:	82nd Avenue	Minor Street:	Norwood Road	
Number of Lanes:	1	Number of Lanes:	1	
AM Peak Hour Volumes:	155	AM Peak Hour Volumes:	186	Total
			10	Rights
			0%	RT Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	1,550	6,200	
Minor Street*	1,860	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	1,550	9,300	
Minor Street*	1,860	950	**No**
Combination Warrant			
Major Street	1,550	7,440	
Minor Street*	1,860	1,480	**No**

* Minor street right-turning traffic volumes reduced by 00%.

Preliminary Traffic Signal Warrant Analysis

Project: 22172 - Norwood Apartments
Date: 2/2/2023
Scenario: 2026 Buildout - PM Peak Hour - No BCP Extension

Major Street:	82nd Avenue		Minor Street:	Norwood Road	
Number of Lanes:	1		Number of Lanes:	1	
PM Peak Hour Volumes:	194		PM Peak Hour Volumes:	156	Total
				25	Rights
				0%	RT Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	1,940	6,200	
Minor Street*	1,560	1,850	No
Condition B: Interruption of Continuous Traffic			
Major Street	1,940	9,300	
Minor Street*	1,560	950	No
Combination Warrant			
Major Street	1,940	7,440	
Minor Street*	1,560	1,480	No

* Minor street right-turning traffic volumes reduced by 00%.

Preliminary Traffic Signal Warrant Analysis

Project: 22172 - Norwood Apartments
Date: 2/2/2023
Scenario: 2026 Buildout - AM Peak Hour - With BCP Extension

Major Street:	82nd Avenue		Minor Street:	Norwood Road	
Number of Lanes:	1		Number of Lanes:	1	
AM Peak Hour Volumes:	155		AM Peak Hour Volumes:	188	Total
				9	Rights
				0%	RT Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	1,550	6,200	
Minor Street*	1,880	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	1,550	9,300	
Minor Street*	1,880	950	**No**
Combination Warrant			
Major Street	1,550	7,440	
Minor Street*	1,880	1,480	**No**

* Minor street right-turning traffic volumes reduced by 00%.

Preliminary Traffic Signal Warrant Analysis

Project: 22172 - Norwood Apartments
Date: 2/2/2023
Scenario: 2026 Buildout - PM Peak Hour - With BCP Extension

Major Street:	82nd Avenue		Minor Street:	Norwood Road	
Number of Lanes:	1		Number of Lanes:	1	
PM Peak Hour Volumes:	193		PM Peak Hour Volumes:	156	Total
				25	Rights
				0%	RT Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	1,930	6,200	
Minor Street*	1,560	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	1,930	9,300	
Minor Street*	1,560	950	**No**
Combination Warrant			
Major Street	1,930	7,440	
Minor Street*	1,560	1,480	**No**

* Minor street right-turning traffic volumes reduced by 00%.

INTERSECTION INFORMATION

City:	Tualatin		Condition:	2026 Background Condition (No BCP Extension)	
Population:	25000			Shared Left-Right Lane	
Intersection Location:					
(Rural/Urban)	Urban			Right-Turn Reduction	50%
Major Street Name:	Boones Ferry Road		Minor Street Name:	Norwood Road	
Number of Moving Lanes for Each	1		Number of Moving Lanes for Each	1	
Speed:	45 mph		Speed:	45 mph	
Street Width:	48 ft		Street Width:	32 ft	

Hour Beginning:	Direction: NB	SB	Hour Beginning:	Direction: EB	WB	WB LT	WB RT
12:00 AM			12:00 AM				
1:00 AM			1:00 AM				
2:00 AM			2:00 AM				
3:00 AM			3:00 AM				
4:00 AM			4:00 AM				
5:00 AM			5:00 AM				
6:00 AM			6:00 AM				
7:00 AM	391	325	7:00 AM	0	102	51	102
8:00 AM	383	329	8:00 AM	0	114	45	137
9:00 AM	257	308	9:00 AM	0	62	29	66
10:00 AM	277	302	10:00 AM	0	59	32	54
11:00 AM	331	330	11:00 AM	0	54	29	50
12:00 PM	357	365	12:00 PM	0	73	39	68
1:00 PM	337	378	1:00 PM	0	65	32	65
2:00 PM	405	481	2:00 PM	0	82	44	75
3:00 PM	353	672	3:00 PM	0	97	36	122
4:00 PM	723	805	4:00 PM	0	90	42	95
5:00 PM	712	727	5:00 PM	0	138	63	150
6:00 PM	337	447	6:00 PM	0	93	41	104
7:00 PM			7:00 PM				
8:00 PM			8:00 PM				
9:00 PM			9:00 PM				
10:00 PM			10:00 PM				
11:00 PM			11:00 PM				
24-hour Total	4,863	5,469	24-hour Total	0	1,029		

Warrants Evaluted:

Warrant 1, 8-Hour Vehicular Volume - Evaluated for Conditions A & B
Warrant 2 , 4-Hour Vehicular Volume - Evaluated
Warrant 3, Peak Hour - Evaluated for Conditions A-2, A-3 (A-1 needs to be evaluated separately), and Condition B
Warrant 4, Pedestrian Volume - Not Analyzed
Warrant 5, School Crossing - Not Analyzed
Warrant 6, Coordinated Signal System - Not Analyzed
Warrant 7, Accident Experience - Not Analyzed
Warrant 8, Roadway Network - Not Analyzed
Warrant 9, Intersection Near a Grade Crossing - Not Analyzed

WARRANT 1, 8-HOUR VEHICULAR VOLUME

	MAJOR			MINOR						
	NB	SB	Total	EB	WB	Max	A	B	A or B	80% A&B
4:00 PM	723	805	1,528	0	90	90	N	Y	Y	N
5:00 PM	712	727	1,439	0	138	138	Y	Y	Y	Y
3:00 PM	353	672	1,025	0	97	97	N	Y	Y	N
2:00 PM	405	481	886	0	82	82	N	Y	Y	N
6:00 PM	337	447	784	0	93	93	N	Y	Y	N
8:00 AM	383	329	712	0	114	114	Y	Y	Y	N
7:00 AM	391	325	716	0	102	102	N	Y	Y	N
12:00 PM	357	365	722	0	73	73	N	Y	Y	N
1:00 PM	337	378	715	0	65	65	N	Y	Y	N
11:00 AM	331	330	661	0	54	54	N	Y	Y	N
10:00 AM	277	302	579	0	59	59	N	Y	Y	N
9:00 AM	257	308	565	0	62	62	N	Y	Y	N

Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:

Major Street Lanes: 1
Minor Street Lanes: 1

CONDITION A - Minimum Vehicular Volume

Minimum Volume on Combined Major Street Approaches: 350
Minimum Volume on Higher Minor Street Approach: 105

CONDITION B - Interruption of Continuous Traffic

Minimum Volume on Combined Major Street Approaches: 525
Minimum Volume on Higher Minor Street Approach: 53

IS CONDITION A OF SIGNAL WARRANT 1 MET? NO
IS CONDITION B OF SIGNAL WARRANT 1 MET? YES
IS COMBINATION OF A OR B MET? YES
IS 80% OF CONDITION A AND CONDITION B MET? NO

Note: Signal Warrant 1 is met if either Condition A or Condition B is met.

WARRANT 2, FOUR HOUR VEHICULAR VOLUME

	MAJOR			MINOR			Calculated	
	NB	SB	Total	EB	WB	Max	Threshold	
4:00 PM	723	805	1,528	0	90	90	60	Y
5:00 PM	712	727	1,439	0	138	138	60	Y
3:00 PM	353	672	1,025	0	97	97	60	Y
2:00 PM	405	481	886	0	82	82	60	Y
6:00 PM	337	447	784	0	93	93	60	Y
8:00 AM	383	329	712	0	114	114	68	Y
7:00 AM	391	325	716	0	102	102	67	Y
12:00 PM	357	365	722	0	73	73	66	Y

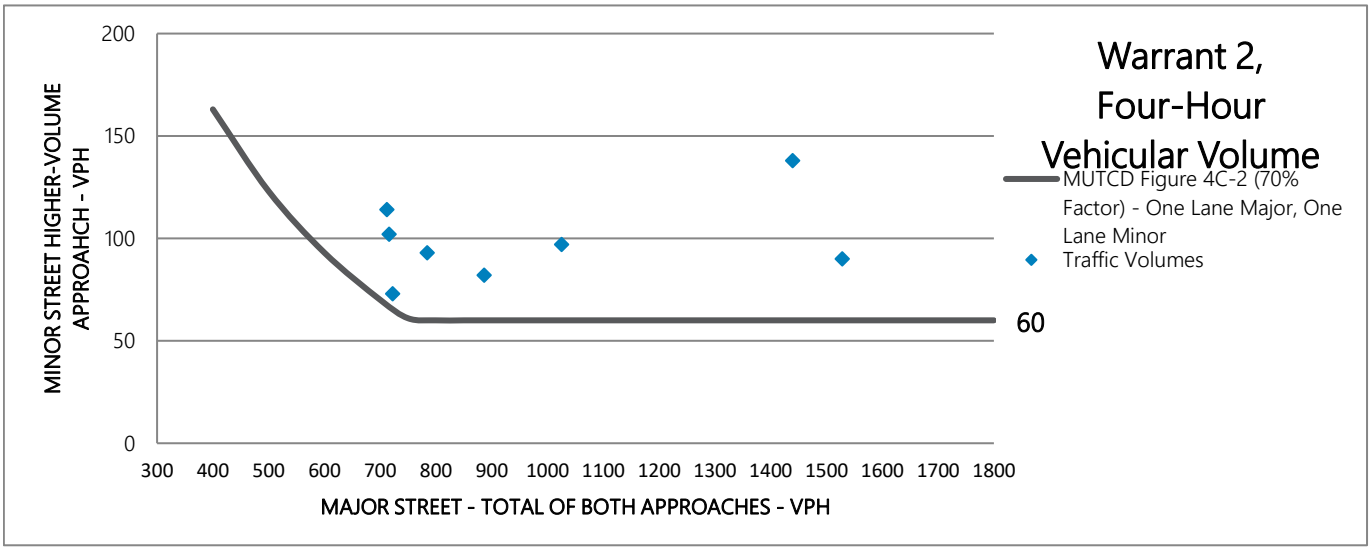
Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:

Major Street Lanes: 1

Minor Street Lanes: 1

IS SIGNAL WARRANT 2 MET? YES



WARRANT 3, PEAK HOUR VEHICULAR VOLUME

	MAJOR			MINOR			Calculated		
	NB	SB	Total	EB	WB	Max	Threshold (B	A-2&3	B
4:00 PM	723	805	1,528	0	90	90	75	N	Y
5:00 PM	712	727	1,439	0	138	138	75	Y	Y
3:00 PM	353	672	1,025	0	97	97	75	N	Y
2:00 PM	405	481	886	0	82	82	95	N	N

Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:
Major Street Lanes: 1
Minor Street Lanes: 1

CONDITION A-1 - Stopped Delay
Cannot be evaluated based on volumes alone. Condition met if traffic on one minor-street approach (one direction only) controlled by STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach.

CONDITION A-2 - Minor Street Volume
Minimum Volume on Higher Minor Street Approach: 100

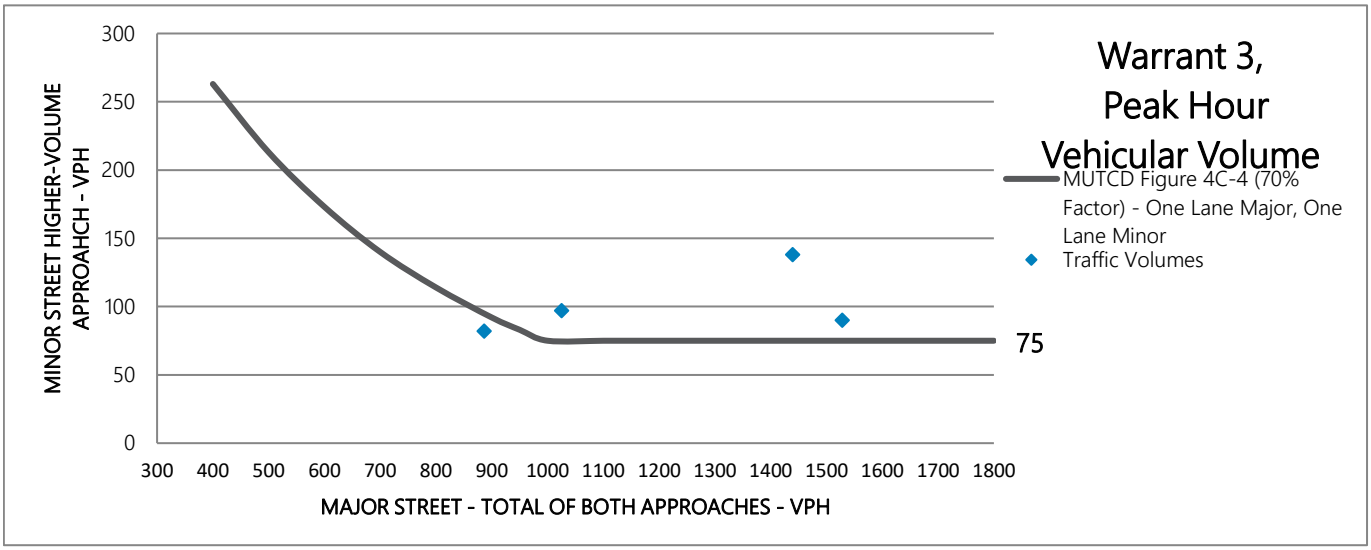
CONDITION A-3 - Total Approach Volume
Minimum Volume of Total Approaches: 650

CONDITION B - Plot of Minor Street Volume (high vol approach) vs. Major Street Volume (Both approaches)

ARE CONDITIONS A-2 AND A-3 OF SIGNAL WARRANT 3 MET? **YES** *Stopped Delay Needs to be Checked*
Note: All 3 subsections of Condition A must be met to warrant signal.

IS CONDITION B OF SIGNAL WARRANT 3 MET? **YES**

Note: Signal Warrant 3 is met if either Condition A or Condition B is met.



INTERSECTION INFORMATION

City:	Tualatin		Condition:	2026 Background Condition (No BCP Extension)			
Population:	25000			Separate Right-Turn Lane			
Intersection Location: (Rural/Urban)	Urban			Right-Turn Reduction	100%		
Major Street Name: Number of Moving	Boones Ferry Road		Minor Street Name: Number of Moving	Norwood Road			
Lanes for Each	1		Lanes for Each	1			
Speed: Street	45 mph		Speed: Street	45 mph			
Width:	48 ft		Width:	32 ft			
Direction:	NB	SB	Direction:	EB	WB		
Hour Beginning:			Hour Beginning:				
12:00 AM			12:00 AM				
1:00 AM			1:00 AM				
2:00 AM			2:00 AM				
3:00 AM			3:00 AM				
4:00 AM			4:00 AM				
5:00 AM			5:00 AM				
6:00 AM			6:00 AM			WB LT	WB RT
7:00 AM	391	325	7:00 AM	0	51	51	102
8:00 AM	383	329	8:00 AM	0	45	45	137
9:00 AM	257	308	9:00 AM	0	29	29	66
10:00 AM	277	302	10:00 AM	0	32	32	54
11:00 AM	331	330	11:00 AM	0	29	29	50
12:00 PM	357	365	12:00 PM	0	39	39	68
1:00 PM	337	378	1:00 PM	0	32	32	65
2:00 PM	405	481	2:00 PM	0	44	44	75
3:00 PM	353	672	3:00 PM	0	36	36	122
4:00 PM	723	805	4:00 PM	0	42	42	95
5:00 PM	712	727	5:00 PM	0	63	63	150
6:00 PM	337	447	6:00 PM	0	41	41	104
7:00 PM			7:00 PM				
8:00 PM			8:00 PM				
9:00 PM			9:00 PM				
10:00 PM			10:00 PM				
11:00 PM			11:00 PM				
24-hour Total	4,863	5,469	24-hour Total	0	483		

Warrants Evaluted:

Warrant 1, 8-Hour Vehicular Volume - Evaluated for Conditions A & B
Warrant 2 , 4-Hour Vehicular Volume - Evaluated
Warrant 3, Peak Hour - Evaluated for Conditions A-2, A-3 (A-1 needs to be evaluated separately), and Condition B
Warrant 4, Pedestrian Volume - Not Analyzed
Warrant 5, School Crossing - Not Analyzed
Warrant 6, Coordinated Signal System - Not Analyzed
Warrant 7, Accident Experience - Not Analyzed
Warrant 8, Roadway Network - Not Analyzed
Warrant 9, Intersection Near a Grade Crossing - Not Analyzed

WARRANT 1, 8-HOUR VEHICULAR VOLUME

	MAJOR			MINOR						
	NB	SB	Total	EB	WB	Max	A	B	A or B	80% A&B
4:00 PM	723	805	1,528	0	42	42	N	N	N	N
5:00 PM	712	727	1,439	0	63	63	N	Y	Y	N
3:00 PM	353	672	1,025	0	36	36	N	N	N	N
2:00 PM	405	481	886	0	44	44	N	N	N	N
6:00 PM	337	447	784	0	41	41	N	N	N	N
7:00 AM	391	325	716	0	51	51	N	N	N	N
12:00 PM	357	365	722	0	39	39	N	N	N	N
8:00 AM	383	329	712	0	45	45	N	N	N	N
1:00 PM	337	378	715	0	32	32	N	N	N	N
11:00 AM	331	330	661	0	29	29	N	N	N	N
10:00 AM	277	302	579	0	32	32	N	N	N	N
9:00 AM	257	308	565	0	29	29	N	N	N	N

Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:

Major Street Lanes: 1
Minor Street Lanes: 1

CONDITION A - Minimum Vehicular Volume

Minimum Volume on Combined Major Street Approaches: 350
Minimum Volume on Higher Minor Street Approach: 105

CONDITION B - Interruption of Continuous Traffic

Minimum Volume on Combined Major Street Approaches: 525
Minimum Volume on Higher Minor Street Approach: 53

IS CONDITION A OF SIGNAL WARRANT 1 MET? NO
IS CONDITION B OF SIGNAL WARRANT 1 MET? NO
IS COMBINATION OF A OR B MET? NO
IS 80% OF CONDITION A AND CONDITION B MET? NO

Note: Signal Warrant 1 is met if either Condition A or Condition B is met.

WARRANT 2, FOUR HOUR VEHICULAR VOLUME

	MAJOR			MINOR			Calculated	
	NB	SB	Total	EB	WB	Max	Threshold	
4:00 PM	723	805	1,528	0	42	42	60	N
5:00 PM	712	727	1,439	0	63	63	60	Y
3:00 PM	353	672	1,025	0	36	36	60	N
2:00 PM	405	481	886	0	44	44	60	N
6:00 PM	337	447	784	0	41	41	60	N
7:00 AM	391	325	716	0	51	51	67	N
12:00 PM	357	365	722	0	39	39	66	N
8:00 AM	383	329	712	0	45	45	68	N

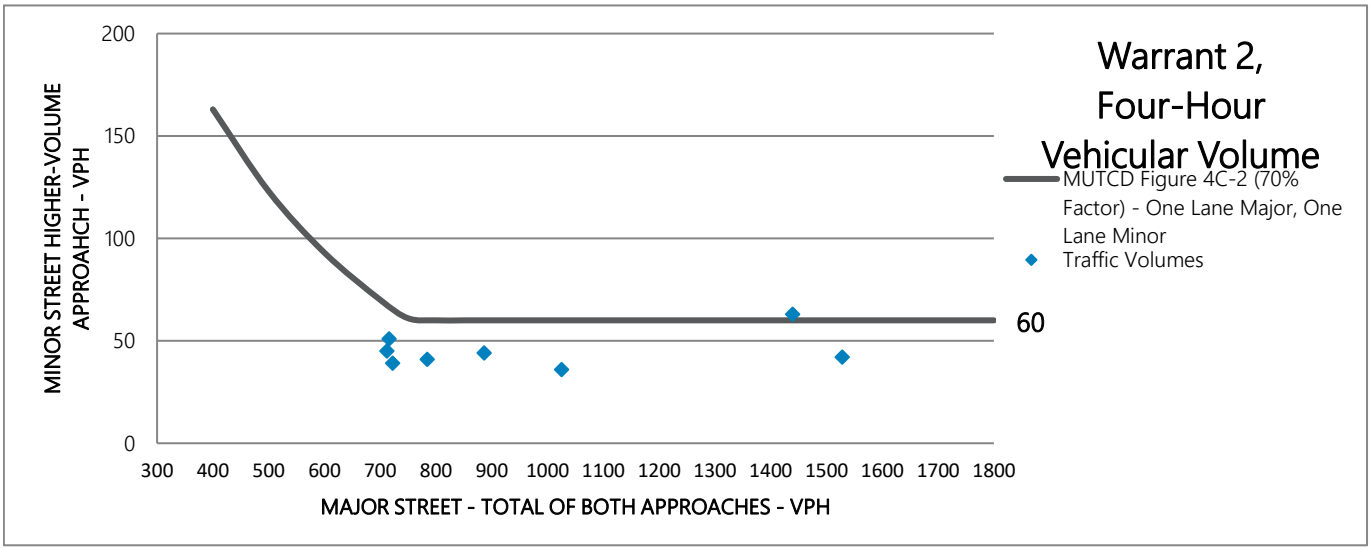
Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:

Major Street Lanes: 1

Minor Street Lanes: 1

IS SIGNAL WARRANT 2 MET? NO



WARRANT 3, PEAK HOUR VEHICULAR VOLUME

	MAJOR			MINOR			Calculated		
	NB	SB	Total	EB	WB	Max	Threshold (B	A-2&3	B
4:00 PM	723	805	1,528	0	42	42	75	N	N
5:00 PM	712	727	1,439	0	63	63	75	N	N
3:00 PM	353	672	1,025	0	36	36	75	N	N
2:00 PM	405	481	886	0	44	44	95	N	N

Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:
Major Street Lanes: 1
Minor Street Lanes: 1

CONDITION A-1 - Stopped Delay
Cannot be evaluated based on volumes alone. Condition met if traffic on one minor-street approach (one direction only) controlled by STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach.

CONDITION A-2 - Minor Street Volume
Minimum Volume on Higher Minor Street Approach: 100

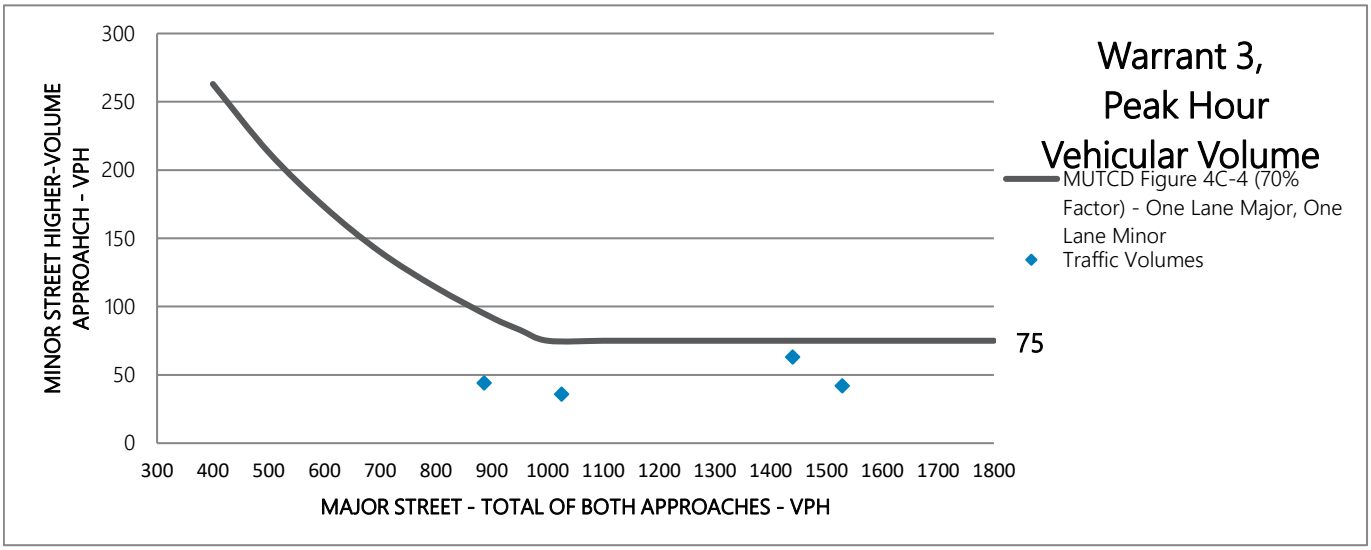
CONDITION A-3 - Total Approach Volume
Minimum Volume of Total Approaches: 650

CONDITION B - Plot of Minor Street Volume (high vol approach) vs. Major Street Volume (Both approaches)

ARE CONDITIONS A-2 AND A-3 OF SIGNAL WARRANT 3 MET? NO
Note: All 3 subsections of Condition A must be met to warrant signal.

IS CONDITION B OF SIGNAL WARRANT 3 MET? NO

Note: Signal Warrant 3 is met if either Condition A or Condition B is met.



INTERSECTION INFORMATION

City:	Tualatin		Condition:	2026 Background Condition with BCP Extension Shared Left-Right Lane	
Population:	25000				
Intersection Location:					
(Rural/Urban)	Urban			Right-Turn Reduction	50%
Major Street Name: Number of Moving	Boones Ferry Road		Minor Street Name: Number of Moving	Norwood Road	
Lanes for Each	1		Lanes for Each	1	
Speed: Street	45 mph		Speed: Street	45 mph	
Width:	48 ft		Width:	32 ft	

Direction:	NB	SB	Direction:	EB	WB		
Hour Beginning:			Hour Beginning:				
12:00 AM			12:00 AM				
1:00 AM			1:00 AM				
2:00 AM			2:00 AM				
3:00 AM			3:00 AM				
4:00 AM			4:00 AM				
5:00 AM			5:00 AM				
6:00 AM			6:00 AM			WB LT	WB RT
7:00 AM	400	337	7:00 AM	0	102	51	102
8:00 AM	397	340	8:00 AM	0	114	45	137
9:00 AM	266	319	9:00 AM	0	62	29	66
10:00 AM	287	314	10:00 AM	0	59	32	54
11:00 AM	343	342	11:00 AM	0	54	29	50
12:00 PM	370	378	12:00 PM	0	73	39	68
1:00 PM	349	391	1:00 PM	0	65	32	65
2:00 PM	420	498	2:00 PM	0	82	44	75
3:00 PM	365	696	3:00 PM	0	97	36	122
4:00 PM	751	834	4:00 PM	0	90	42	95
5:00 PM	737	751	5:00 PM	0	138	63	150
6:00 PM	349	461	6:00 PM	0	93	41	104
7:00 PM			7:00 PM				
8:00 PM			8:00 PM				
9:00 PM			9:00 PM				
10:00 PM			10:00 PM				
11:00 PM			11:00 PM				
24-hour Total	5,034	5,661	24-hour Total	0	1,029		

Warrants Evaluted:

Warrant 1, 8-Hour Vehicular Volume - Evaluated for Conditions A & B
Warrant 2 , 4-Hour Vehicular Volume - Evaluated
Warrant 3, Peak Hour - Evaluated for Conditions A-2, A-3 (A-1 needs to be evaluated separately), and Condition B
Warrant 4, Pedestrian Volume - Not Analyzed
Warrant 5, School Crossing - Not Analyzed
Warrant 6, Coordinated Signal System - Not Analyzed
Warrant 7, Accident Experience - Not Analyzed
Warrant 8, Roadway Network - Not Analyzed
Warrant 9, Intersection Near a Grade Crossing - Not Analyzed

WARRANT 1, 8-HOUR VEHICULAR VOLUME

	MAJOR			MINOR						
	NB	SB	Total	EB	WB	Max	A	B	A or B	80% A&B
4:00 PM	751	834	1,585	0	90	90	N	Y	Y	N
5:00 PM	737	751	1,488	0	138	138	Y	Y	Y	Y
3:00 PM	365	696	1,061	0	97	97	N	Y	Y	N
2:00 PM	420	498	918	0	82	82	N	Y	Y	N
6:00 PM	349	461	810	0	93	93	N	Y	Y	N
8:00 AM	397	340	737	0	114	114	Y	Y	Y	N
7:00 AM	400	337	737	0	102	102	N	Y	Y	N
12:00 PM	370	378	748	0	73	73	N	Y	Y	N
1:00 PM	349	391	740	0	65	65	N	Y	Y	N
11:00 AM	343	342	685	0	54	54	N	Y	Y	N
10:00 AM	287	314	601	0	59	59	N	Y	Y	N
9:00 AM	266	319	585	0	62	62	N	Y	Y	N

Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:

Major Street Lanes: 1
Minor Street Lanes: 1

CONDITION A - Minimum Vehicular Volume

Minimum Volume on Combined Major Street Approaches: 350
Minimum Volume on Higher Minor Street Approach: 105

CONDITION B - Interruption of Continuous Traffic

Minimum Volume on Combined Major Street Approaches: 525
Minimum Volume on Higher Minor Street Approach: 53

IS CONDITION A OF SIGNAL WARRANT 1 MET? NO
IS CONDITION B OF SIGNAL WARRANT 1 MET? YES
IS COMBINATION OF A OR B MET? YES
IS 80% OF CONDITION A AND CONDITION B MET? NO

Note: Signal Warrant 1 is met if either Condition A or Condition B is met.

WARRANT 2, FOUR HOUR VEHICULAR VOLUME

	MAJOR			MINOR			Calculated	
	NB	SB	Total	EB	WB	Max	Threshold	
4:00 PM	751	834	1,585	0	90	90	60	Y
5:00 PM	737	751	1,488	0	138	138	60	Y
3:00 PM	365	696	1,061	0	97	97	60	Y
2:00 PM	420	498	918	0	82	82	60	Y
6:00 PM	349	461	810	0	93	93	60	Y
8:00 AM	397	340	737	0	114	114	63	Y
7:00 AM	400	337	737	0	102	102	63	Y
12:00 PM	370	378	748	0	73	73	62	Y

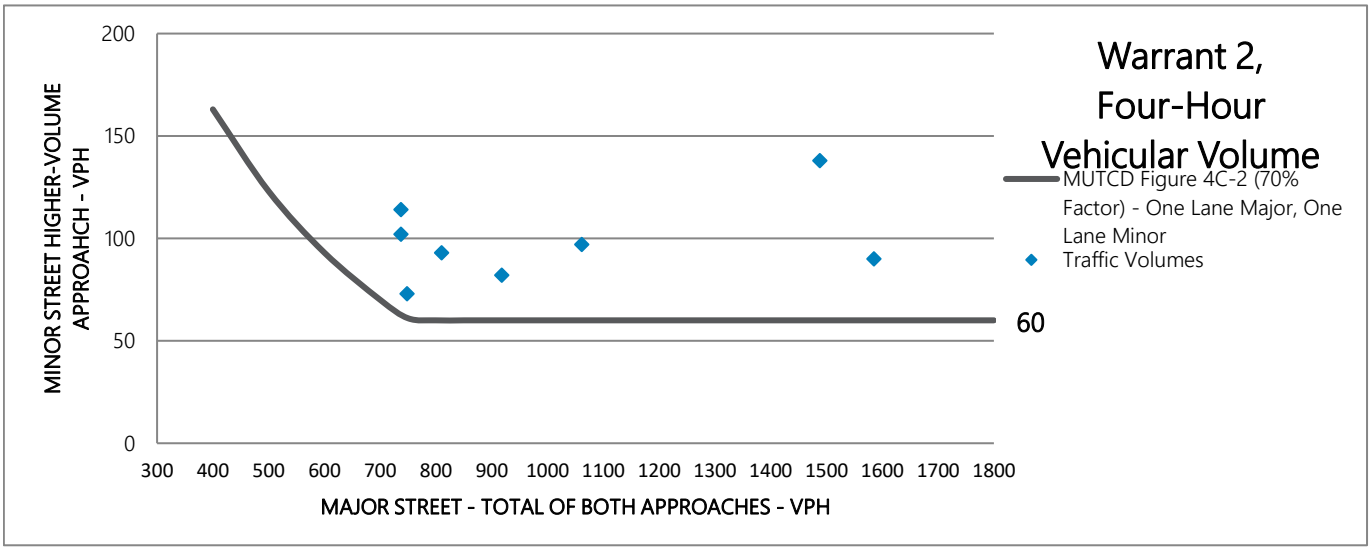
Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:

Major Street Lanes: 1

Minor Street Lanes: 1

IS SIGNAL WARRANT 2 MET? YES



WARRANT 3, PEAK HOUR VEHICULAR VOLUME

	MAJOR			MINOR			Calculated		
	NB	SB	Total	EB	WB	Max	Threshold (B	A-2&3	B
4:00 PM	751	834	1,585	0	90	90	75	N	Y
5:00 PM	737	751	1,488	0	138	138	75	Y	Y
3:00 PM	365	696	1,061	0	97	97	75	N	Y
2:00 PM	420	498	918	0	82	82	89	N	N

Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:
Major Street Lanes: 1
Minor Street Lanes: 1

CONDITION A-1 - Stopped Delay
Cannot be evaluated based on volumes alone. Condition met if traffic on one minor-street approach (one direction only) controlled by STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach.

CONDITION A-2 - Minor Street Volume
Minimum Volume on Higher Minor Street Approach: 100

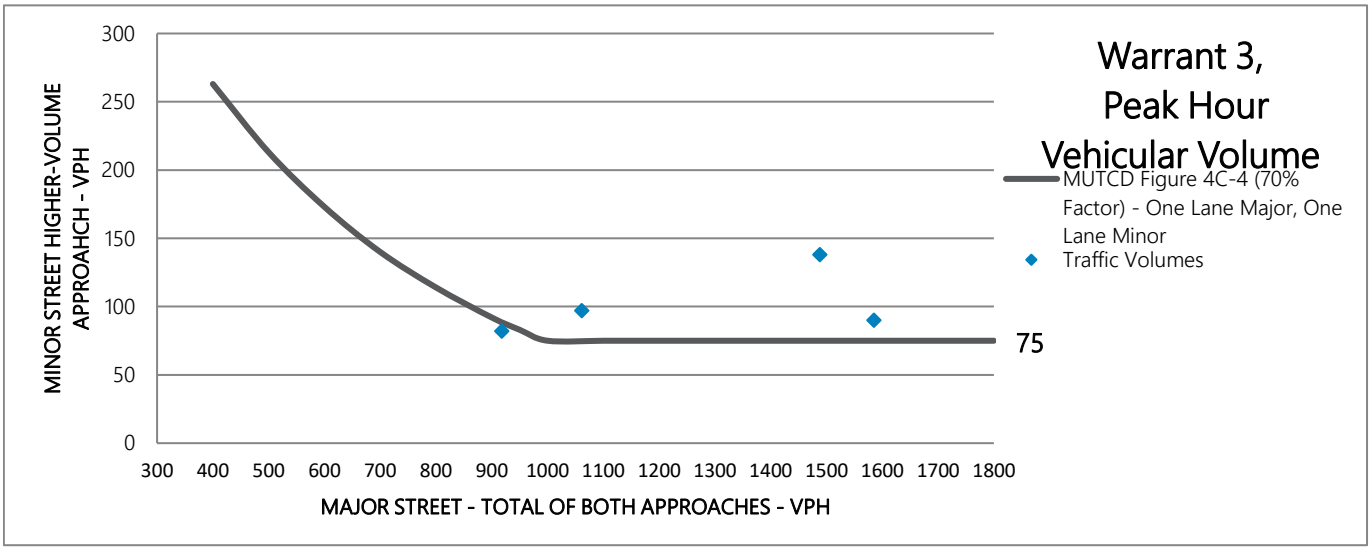
CONDITION A-3 - Total Approach Volume
Minimum Volume of Total Approaches: 650

CONDITION B - Plot of Minor Street Volume (high vol approach) vs. Major Street Volume (Both approaches)

ARE CONDITIONS A-2 AND A-3 OF SIGNAL WARRANT 3 MET? **YES** *Stopped Delay Needs to be Checked*
Note: All 3 subsections of Condition A must be met to warrant signal.

IS CONDITION B OF SIGNAL WARRANT 3 MET? **YES**

Note: Signal Warrant 3 is met if either Condition A or Condition B is met.



INTERSECTION INFORMATION

City:	Tualatin		Condition:	2026 Background Condition with BCP Extension Separate Right-Turn Lane	
Population:	25000				
Intersection Location:					
(Rural/Urban)	Urban			Right-Turn Reduction	100%
Major Street Name: Number of Moving	Boones Ferry Road		Minor Street Name: Number of Moving	Norwood Road	
Lanes for Each	1		Lanes for Each	1	
Speed: Street	45 mph		Speed: Street	45 mph	
Width:	48 ft		Width:	32 ft	
Direction:	NB	SB	Direction:	EB	WB

Hour Beginning:			Hour Beginning:				
12:00 AM			12:00 AM				
1:00 AM			1:00 AM				
2:00 AM			2:00 AM				
3:00 AM			3:00 AM				
4:00 AM			4:00 AM				
5:00 AM			5:00 AM				
6:00 AM			6:00 AM			WB LT	WB RT
7:00 AM	400	337	7:00 AM	0	51	51	102
8:00 AM	397	340	8:00 AM	0	45	45	137
9:00 AM	266	319	9:00 AM	0	29	29	66
10:00 AM	287	314	10:00 AM	0	32	32	54
11:00 AM	343	342	11:00 AM	0	29	29	50
12:00 PM	370	378	12:00 PM	0	39	39	68
1:00 PM	349	391	1:00 PM	0	32	32	65
2:00 PM	420	498	2:00 PM	0	44	44	75
3:00 PM	365	696	3:00 PM	0	36	36	122
4:00 PM	751	834	4:00 PM	0	42	42	95
5:00 PM	737	751	5:00 PM	0	63	63	150
6:00 PM	349	461	6:00 PM	0	41	41	104
7:00 PM			7:00 PM				
8:00 PM			8:00 PM				
9:00 PM			9:00 PM				
10:00 PM			10:00 PM				
11:00 PM			11:00 PM				
24-hour Total	5,034	5,661	24-hour Total	0	483		

Warrants Evaluted:

Warrant 1, 8-Hour Vehicular Volume - Evaluated for Conditions A & B
Warrant 2 , 4-Hour Vehicular Volume - Evaluated
Warrant 3, Peak Hour - Evaluated for Conditions A-2, A-3 (A-1 needs to be evaluated separately), and Condition B
Warrant 4, Pedestrian Volume - Not Analyzed
Warrant 5, School Crossing - Not Analyzed
Warrant 6, Coordinated Signal System - Not Analyzed
Warrant 7, Accident Experience - Not Analyzed
Warrant 8, Roadway Network - Not Analyzed
Warrant 9, Intersection Near a Grade Crossing - Not Analyzed

WARRANT 1, 8-HOUR VEHICULAR VOLUME

	MAJOR			MINOR						
	NB	SB	Total	EB	WB	Max	A	B	A or B	80% A&B
4:00 PM	751	834	1,585	0	42	42	N	N	N	N
5:00 PM	737	751	1,488	0	63	63	N	Y	Y	N
3:00 PM	365	696	1,061	0	36	36	N	N	N	N
2:00 PM	420	498	918	0	44	44	N	N	N	N
6:00 PM	349	461	810	0	41	41	N	N	N	N
7:00 AM	400	337	737	0	51	51	N	N	N	N
12:00 PM	370	378	748	0	39	39	N	N	N	N
8:00 AM	397	340	737	0	45	45	N	N	N	N
1:00 PM	349	391	740	0	32	32	N	N	N	N
11:00 AM	343	342	685	0	29	29	N	N	N	N
10:00 AM	287	314	601	0	32	32	N	N	N	N
9:00 AM	266	319	585	0	29	29	N	N	N	N

Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:

Major Street Lanes: 1
Minor Street Lanes: 1

CONDITION A - Minimum Vehicular Volume

Minimum Volume on Combined Major Street Approaches: 350
Minimum Volume on Higher Minor Street Approach: 105

CONDITION B - Interruption of Continuous Traffic

Minimum Volume on Combined Major Street Approaches: 525
Minimum Volume on Higher Minor Street Approach: 53

IS CONDITION A OF SIGNAL WARRANT 1 MET? NO
IS CONDITION B OF SIGNAL WARRANT 1 MET? NO
IS COMBINATION OF A OR B MET? NO
IS 80% OF CONDITION A AND CONDITION B MET? NO

Note: Signal Warrant 1 is met if either Condition A or Condition B is met.

WARRANT 2, FOUR HOUR VEHICULAR VOLUME

	MAJOR			MINOR			Calculated	
	NB	SB	Total	EB	WB	Max	Threshold	
4:00 PM	751	834	1,585	0	42	42	60	N
5:00 PM	737	751	1,488	0	63	63	60	Y
3:00 PM	365	696	1,061	0	36	36	60	N
2:00 PM	420	498	918	0	44	44	60	N
6:00 PM	349	461	810	0	41	41	60	N
7:00 AM	400	337	737	0	51	51	63	N
12:00 PM	370	378	748	0	39	39	62	N
8:00 AM	397	340	737	0	45	45	63	N

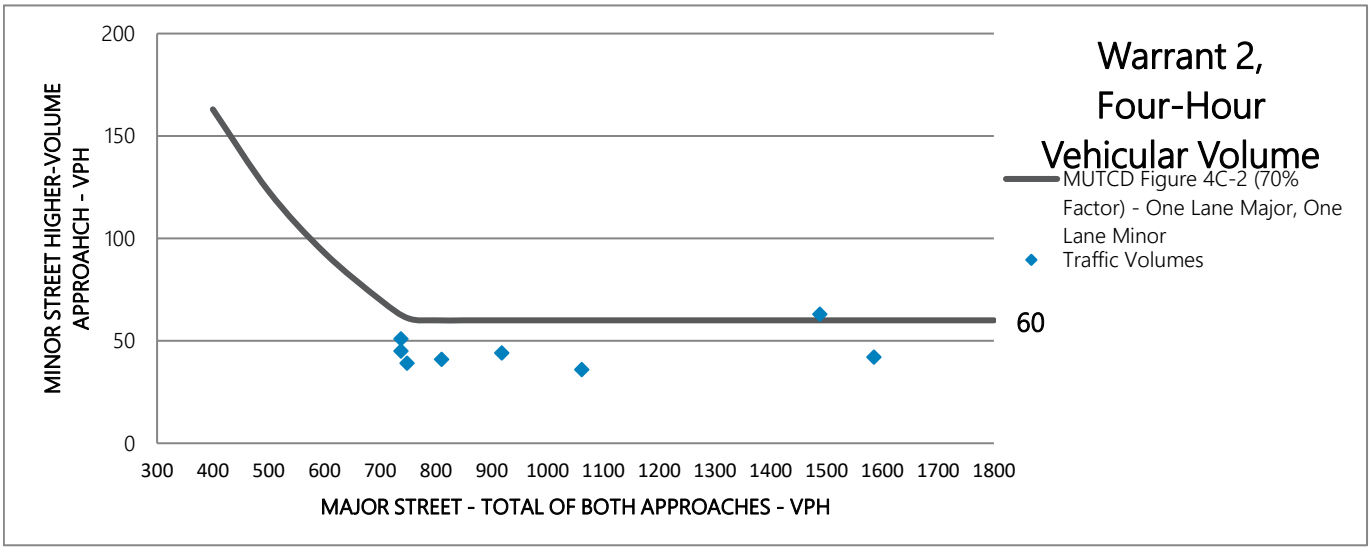
Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:

Major Street Lanes: 1

Minor Street Lanes: 1

IS SIGNAL WARRANT 2 MET? NO



WARRANT 3, PEAK HOUR VEHICULAR VOLUME

	MAJOR			MINOR			Calculated		
	NB	SB	Total	EB	WB	Max	Threshold (B	A-2&3	B
4:00 PM	751	834	1,585	0	42	42	75	N	N
5:00 PM	737	751	1,488	0	63	63	75	N	N
3:00 PM	365	696	1,061	0	36	36	75	N	N
2:00 PM	420	498	918	0	44	44	89	N	N

Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:
Major Street Lanes: 1
Minor Street Lanes: 1

CONDITION A-1 - Stopped Delay
Cannot be evaluated based on volumes alone. Condition met if traffic on one minor-street approach (one direction only) controlled by STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach.

CONDITION A-2 - Minor Street Volume
Minimum Volume on Higher Minor Street Approach: 100

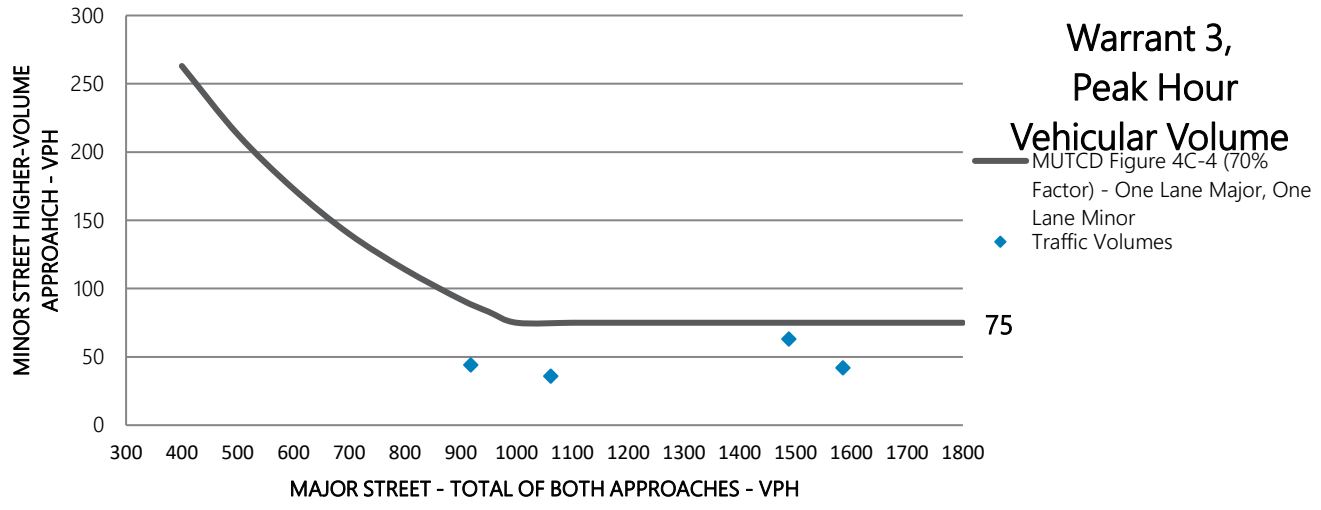
CONDITION A-3 - Total Approach Volume
Minimum Volume of Total Approaches: 650

CONDITION B - Plot of Minor Street Volume (high vol approach) vs. Major Street Volume (Both approaches)

ARE CONDITIONS A-2 AND A-3 OF SIGNAL WARRANT 3 MET? NO
Note: All 3 subsections of Condition A must be met to warrant signal.

IS CONDITION B OF SIGNAL WARRANT 3 MET? NO

Note: Signal Warrant 3 is met if either Condition A or Condition B is met.



INTERSECTION INFORMATION

City:	Tualatin		Condition:	2026 Buildout Condition (No BCP Extension)	
Population:	25000			Shared Left-Right Lane	
Intersection Location:					
(Rural/Urban)	Urban			Right-Turn Reduction	50%
Major Street Name:	Boones Ferry Road		Minor Street Name:	Norwood Road	
Number of Moving Lanes for Each	1		Number of Moving Lanes for Each	1	
Speed:	45 mph		Speed:	45 mph	
Street Width:	48 ft		Street Width:	32 ft	

Hour Beginning:	Direction: NB	SB	Hour Beginning:	Direction: EB	WB	WB LT	WB RT
12:00 AM			12:00 AM				
1:00 AM			1:00 AM				
2:00 AM			2:00 AM				
3:00 AM			3:00 AM				
4:00 AM			4:00 AM				
5:00 AM			5:00 AM				
6:00 AM			6:00 AM				
7:00 AM	399	332	7:00 AM	0	166	95	141
8:00 AM	396	341	8:00 AM	0	164	80	168
9:00 AM	269	318	9:00 AM	0	91	49	84
10:00 AM	287	311	10:00 AM	0	88	52	71
11:00 AM	347	344	11:00 AM	0	82	48	67
12:00 PM	376	381	12:00 PM	0	98	56	83
1:00 PM	353	392	1:00 PM	0	91	50	81
2:00 PM	428	502	2:00 PM	0	111	64	93
3:00 PM	381	697	3:00 PM	0	129	58	141
4:00 PM	765	842	4:00 PM	0	123	65	116
5:00 PM	759	769	5:00 PM	0	183	94	178
6:00 PM	377	483	6:00 PM	0	132	68	128
7:00 PM			7:00 PM				
8:00 PM			8:00 PM				
9:00 PM			9:00 PM				
10:00 PM			10:00 PM				
11:00 PM			11:00 PM				
24-hour Total	5,137	5,712	24-hour Total	0	1,458		

Warrants Evaluted:

Warrant 1, 8-Hour Vehicular Volume - Evaluated for Conditions A & B
Warrant 2 , 4-Hour Vehicular Volume - Evaluated
Warrant 3, Peak Hour - Evaluated for Conditions A-2, A-3 (A-1 needs to be evaluated separately), and Condition B
Warrant 4, Pedestrian Volume - Not Analyzed
Warrant 5, School Crossing - Not Analyzed
Warrant 6, Coordinated Signal System - Not Analyzed
Warrant 7, Accident Experience - Not Analyzed
Warrant 8, Roadway Network - Not Analyzed
Warrant 9, Intersection Near a Grade Crossing - Not Analyzed

WARRANT 1, 8-HOUR VEHICULAR VOLUME

	MAJOR			MINOR						
	NB	SB	Total	EB	WB	Max	A	B	A or B	80% A&B
4:00 PM	765	842	1,607	0	123	123	Y	Y	Y	N
5:00 PM	759	769	1,528	0	183	183	Y	Y	Y	Y
3:00 PM	381	697	1,078	0	129	129	Y	Y	Y	N
2:00 PM	428	502	930	0	111	111	Y	Y	Y	N
6:00 PM	377	483	860	0	132	132	Y	Y	Y	Y
8:00 AM	396	341	737	0	164	164	Y	Y	Y	Y
7:00 AM	399	332	731	0	166	166	Y	Y	Y	Y
12:00 PM	376	381	757	0	98	98	N	Y	Y	N
1:00 PM	353	392	745	0	91	91	N	Y	Y	N
11:00 AM	347	344	691	0	82	82	N	Y	Y	N
10:00 AM	287	311	598	0	88	88	N	Y	Y	N
9:00 AM	269	318	587	0	91	91	N	Y	Y	N

Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:

Major Street Lanes: 1
Minor Street Lanes: 1

CONDITION A - Minimum Vehicular Volume

Minimum Volume on Combined Major Street Approaches:	350
Minimum Volume on Higher Minor Street Approach:	105

CONDITION B - Interruption of Continuous Traffic

Minimum Volume on Combined Major Street Approaches:	525
Minimum Volume on Higher Minor Street Approach:	53

IS CONDITION A OF SIGNAL WARRANT 1 MET?	**NO**
IS CONDITION B OF SIGNAL WARRANT 1 MET?	**YES**
IS COMBINATION OF A OR B MET?	**YES**
IS 80% OF CONDITION A AND CONDITION B MET?	**NO**

Note: Signal Warrant 1 is met if either Condition A or Condition B is met.

WARRANT 2, FOUR HOUR VEHICULAR VOLUME

	MAJOR			MINOR			Calculated	
	NB	SB	Total	EB	WB	Max	Threshold	
4:00 PM	765	842	1,607	0	123	123	60	Y
5:00 PM	759	769	1,528	0	183	183	60	Y
3:00 PM	381	697	1,078	0	129	129	60	Y
2:00 PM	428	502	930	0	111	111	60	Y
6:00 PM	377	483	860	0	132	132	60	Y
8:00 AM	396	341	737	0	164	164	63	Y
7:00 AM	399	332	731	0	166	166	65	Y
12:00 PM	376	381	757	0	98	98	60	Y

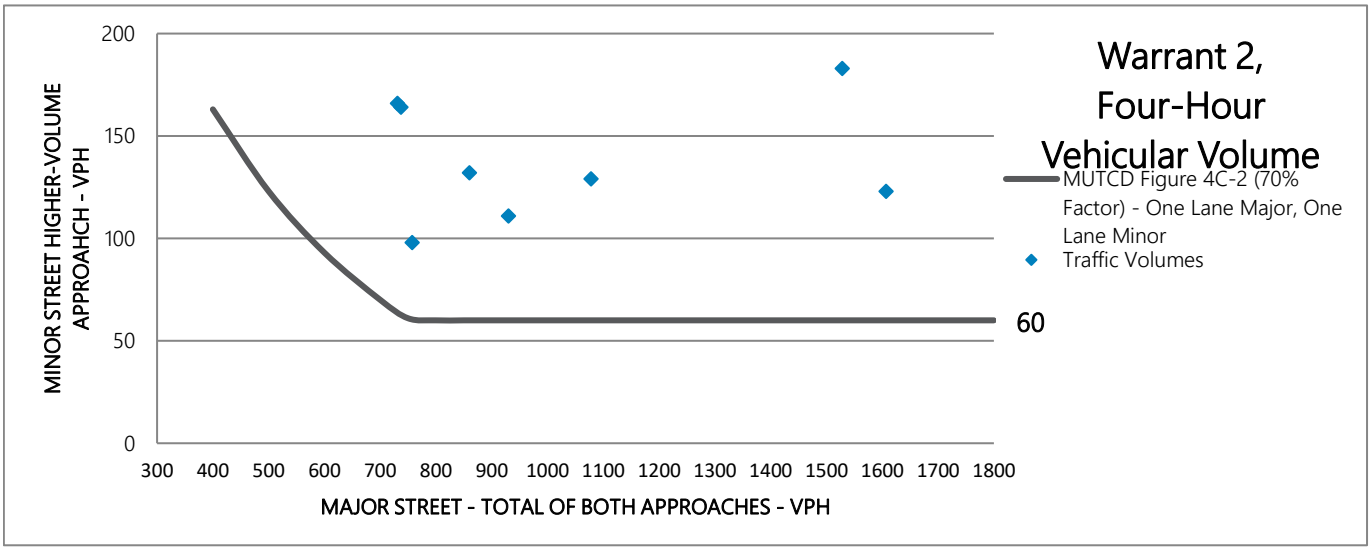
Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:

Major Street Lanes: 1

Minor Street Lanes: 1

IS SIGNAL WARRANT 2 MET? YES



WARRANT 3, PEAK HOUR VEHICULAR VOLUME

	MAJOR			MINOR			Calculated		
	NB	SB	Total	EB	WB	Max	Threshold (B	A-2&3	B
4:00 PM	765	842	1,607	0	123	123	75	Y	Y
5:00 PM	759	769	1,528	0	183	183	75	Y	Y
3:00 PM	381	697	1,078	0	129	129	75	Y	Y
2:00 PM	428	502	930	0	111	111	87	Y	Y

Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:
Major Street Lanes: 1
Minor Street Lanes: 1

CONDITION A-1 - Stopped Delay
Cannot be evaluated based on volumes alone. Condition met if traffic on one minor-street approach (one direction only) controlled by STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach.

CONDITION A-2 - Minor Street Volume
Minimum Volume on Higher Minor Street Approach: 100

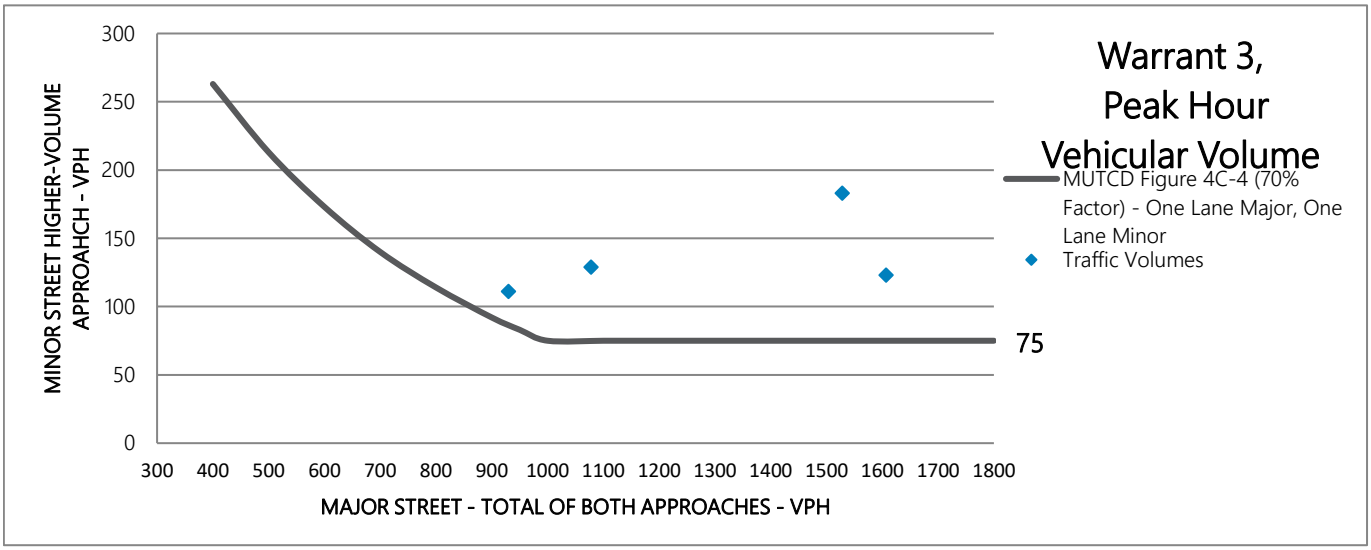
CONDITION A-3 - Total Approach Volume
Minimum Volume of Total Approaches: 650

CONDITION B - Plot of Minor Street Volume (high vol approach) vs. Major Street Volume (Both approaches)

ARE CONDITIONS A-2 AND A-3 OF SIGNAL WARRANT 3 MET? **YES** *Stopped Delay Needs to be Checked*
Note: All 3 subsections of Condition A must be met to warrant signal.

IS CONDITION B OF SIGNAL WARRANT 3 MET? **YES**

Note: Signal Warrant 3 is met if either Condition A or Condition B is met.



INTERSECTION INFORMATION

City:	Tualatin		Condition:	2026 Buildout Condition (No BCP Extension)	
Population:	25000			Separate Right-Turn Lane	
Intersection Location: (Rural/Urban)	Urban			Right-Turn Reduction	100%
Major Street Name: Number of Moving Lanes for Each Speed: Street Width:	Boones Ferry Road 1 45 mph 48 ft		Minor Street Name: Number of Moving Lanes for Each Speed: Street Width:	Norwood Road 1 45 mph 32 ft	
Direction:	NB	SB	Direction:	EB	WB
Hour Beginning:			Hour Beginning:		
12:00 AM			12:00 AM		
1:00 AM			1:00 AM		
2:00 AM			2:00 AM		
3:00 AM			3:00 AM		
4:00 AM			4:00 AM		
5:00 AM			5:00 AM		
6:00 AM			6:00 AM		
7:00 AM	399	332	7:00 AM	0	95
8:00 AM	396	341	8:00 AM	0	80
9:00 AM	269	318	9:00 AM	0	49
10:00 AM	287	311	10:00 AM	0	52
11:00 AM	347	344	11:00 AM	0	48
12:00 PM	376	381	12:00 PM	0	56
1:00 PM	353	392	1:00 PM	0	50
2:00 PM	428	502	2:00 PM	0	64
3:00 PM	381	697	3:00 PM	0	58
4:00 PM	765	842	4:00 PM	0	65
5:00 PM	759	769	5:00 PM	0	94
6:00 PM	377	483	6:00 PM	0	68
7:00 PM			7:00 PM		
8:00 PM			8:00 PM		
9:00 PM			9:00 PM		
10:00 PM			10:00 PM		
11:00 PM			11:00 PM		
24-hour Total	5,137	5,712	24-hour Total	0	779

WB LT	WB RT
95	141
80	168
49	84
52	71
48	67
56	83
50	81
64	93
58	141
65	116
94	178
68	128

Warrants Evaluted:

Warrant 1, 8-Hour Vehicular Volume - Evaluated for Conditions A & B
Warrant 2 , 4-Hour Vehicular Volume - Evaluated
Warrant 3, Peak Hour - Evaluated for Conditions A-2, A-3 (A-1 needs to be evaluated separately), and Condition B
Warrant 4, Pedestrian Volume - Not Analyzed
Warrant 5, School Crossing - Not Analyzed
Warrant 6, Coordinated Signal System - Not Analyzed
Warrant 7, Accident Experience - Not Analyzed
Warrant 8, Roadway Network - Not Analyzed
Warrant 9, Intersection Near a Grade Crossing - Not Analyzed

WARRANT 1, 8-HOUR VEHICULAR VOLUME

	MAJOR			MINOR						
	NB	SB	Total	EB	WB	Max	A	B	A or B	80% A&B
4:00 PM	765	842	1,607	0	65	65	N	Y	Y	N
5:00 PM	759	769	1,528	0	94	94	N	Y	Y	N
3:00 PM	381	697	1,078	0	58	58	N	Y	Y	N
2:00 PM	428	502	930	0	64	64	N	Y	Y	N
6:00 PM	377	483	860	0	68	68	N	Y	Y	N
7:00 AM	399	332	731	0	95	95	N	Y	Y	N
8:00 AM	396	341	737	0	80	80	N	Y	Y	N
12:00 PM	376	381	757	0	56	56	N	Y	Y	N
1:00 PM	353	392	745	0	50	50	N	N	N	N
11:00 AM	347	344	691	0	48	48	N	N	N	N
10:00 AM	287	311	598	0	52	52	N	N	N	N
9:00 AM	269	318	587	0	49	49	N	N	N	N

Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:

Major Street Lanes: 1
Minor Street Lanes: 1

CONDITION A - Minimum Vehicular Volume

Minimum Volume on Combined Major Street Approaches: 350
Minimum Volume on Higher Minor Street Approach: 105

CONDITION B - Interruption of Continuous Traffic

Minimum Volume on Combined Major Street Approaches: 525
Minimum Volume on Higher Minor Street Approach: 53

IS CONDITION A OF SIGNAL WARRANT 1 MET? NO
IS CONDITION B OF SIGNAL WARRANT 1 MET? YES
IS COMBINATION OF A OR B MET? NO
IS 80% OF CONDITION A AND CONDITION B MET? NO

Note: Signal Warrant 1 is met if either Condition A or Condition B is met.

WARRANT 2, FOUR HOUR VEHICULAR VOLUME

	MAJOR			MINOR			Calculated	
	NB	SB	Total	EB	WB	Max	Threshold	
4:00 PM	765	842	1,607	0	65	65	60	Y
5:00 PM	759	769	1,528	0	94	94	60	Y
3:00 PM	381	697	1,078	0	58	58	60	N
2:00 PM	428	502	930	0	64	64	60	Y
6:00 PM	377	483	860	0	68	68	60	Y
7:00 AM	399	332	731	0	95	95	65	Y
8:00 AM	396	341	737	0	80	80	63	Y
12:00 PM	376	381	757	0	56	56	60	N

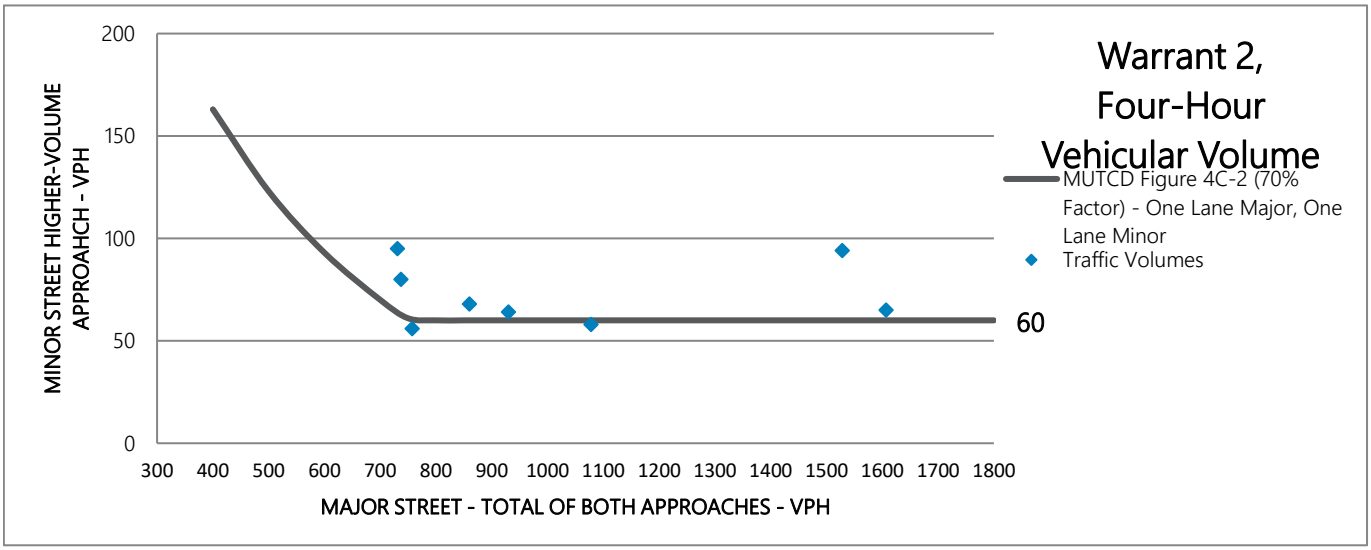
Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:

Major Street Lanes: 1

Minor Street Lanes: 1

IS SIGNAL WARRANT 2 MET? YES



WARRANT 3, PEAK HOUR VEHICULAR VOLUME

	MAJOR			MINOR			Calculated		
	NB	SB	Total	EB	WB	Max	Threshold (B	A-2&3	B
4:00 PM	765	842	1,607	0	65	65	75	N	N
5:00 PM	759	769	1,528	0	94	94	75	N	Y
3:00 PM	381	697	1,078	0	58	58	75	N	N
2:00 PM	428	502	930	0	64	64	87	N	N

Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:
Major Street Lanes: 1
Minor Street Lanes: 1

CONDITION A-1 - Stopped Delay
Cannot be evaluated based on volumes alone. Condition met if traffic on one minor-street approach (one direction only) controlled by STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach.

CONDITION A-2 - Minor Street Volume
Minimum Volume on Higher Minor Street Approach: 100

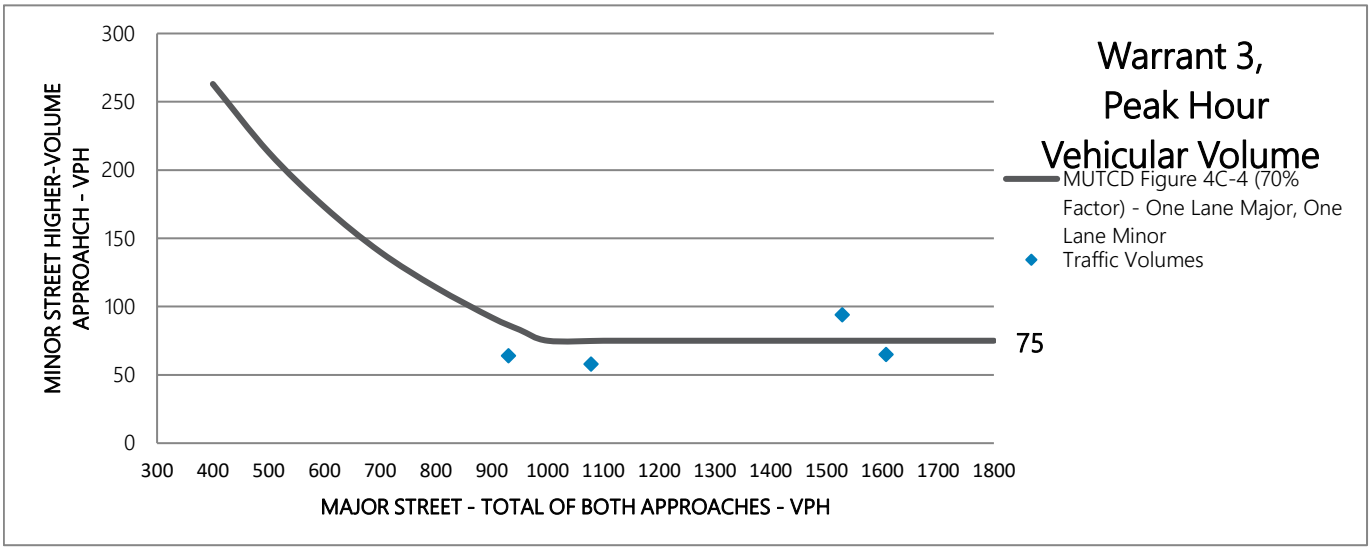
CONDITION A-3 - Total Approach Volume
Minimum Volume of Total Approaches: 650

CONDITION B - Plot of Minor Street Volume (high vol approach) vs. Major Street Volume (Both approaches)

ARE CONDITIONS A-2 AND A-3 OF SIGNAL WARRANT 3 MET? NO
Note: All 3 subsections of Condition A must be met to warrant signal.

IS CONDITION B OF SIGNAL WARRANT 3 MET? YES

Note: Signal Warrant 3 is met if either Condition A or Condition B is met.



INTERSECTION INFORMATION

City:	Tualatin		Condition:	2026 Buildout Condition with BCP Extension			
Population:	25000			Shared Left-Right Lane			
Intersection Location:							
(Rural/Urban)	Urban			Right-Turn Reduction	50%		
Major Street Name:	Boones Ferry Road		Minor Street Name:	Norwood Road			
Number of Moving Lanes for Each	1		Number of Moving Lanes for Each	1			
Speed:	45 mph		Speed:	45 mph			
Street Width:	48 ft		Street Width:	32 ft			
Direction:	NB	SB	Direction:	EB	WB		
Hour Beginning:			Hour Beginning:				
12:00 AM			12:00 AM				
1:00 AM			1:00 AM				
2:00 AM			2:00 AM				
3:00 AM			3:00 AM				
4:00 AM			4:00 AM				
5:00 AM			5:00 AM				
6:00 AM			6:00 AM			WB LT	WB RT
7:00 AM	409	344	7:00 AM	0	169	100	137
8:00 AM	411	350	8:00 AM	0	166	84	164
9:00 AM	279	328	9:00 AM	0	92	51	82
10:00 AM	298	322	10:00 AM	0	89	54	69
11:00 AM	360	354	11:00 AM	0	84	51	65
12:00 PM	391	392	12:00 PM	0	99	58	81
1:00 PM	367	404	1:00 PM	0	92	52	79
2:00 PM	446	516	2:00 PM	0	112	66	91
3:00 PM	397	718	3:00 PM	0	130	60	139
4:00 PM	797	866	4:00 PM	0	125	68	113
5:00 PM	789	787	5:00 PM	0	185	98	174
6:00 PM	393	492	6:00 PM	0	135	72	125
7:00 PM			7:00 PM				
8:00 PM			8:00 PM				
9:00 PM			9:00 PM				
10:00 PM			10:00 PM				
11:00 PM			11:00 PM				
24-hour Total	5,337	5,873	24-hour Total	0	1,478		

Warrants Evaluted:

Warrant 1, 8-Hour Vehicular Volume - Evaluated for Conditions A & B
Warrant 2 , 4-Hour Vehicular Volume - Evaluated
Warrant 3, Peak Hour - Evaluated for Conditions A-2, A-3 (A-1 needs to be evaluated separately), and Condition B
Warrant 4, Pedestrian Volume - Not Analyzed
Warrant 5, School Crossing - Not Analyzed
Warrant 6, Coordinated Signal System - Not Analyzed
Warrant 7, Accident Experience - Not Analyzed
Warrant 8, Roadway Network - Not Analyzed
Warrant 9, Intersection Near a Grade Crossing - Not Analyzed

WARRANT 1, 8-HOUR VEHICULAR VOLUME

	MAJOR			MINOR						
	NB	SB	Total	EB	WB	Max	A	B	A or B	80% A&B
4:00 PM	797	866	1,663	0	125	125	Y	Y	Y	N
5:00 PM	789	787	1,576	0	185	185	Y	Y	Y	Y
3:00 PM	397	718	1,115	0	130	130	Y	Y	Y	N
2:00 PM	446	516	962	0	112	112	Y	Y	Y	N
6:00 PM	393	492	885	0	135	135	Y	Y	Y	Y
8:00 AM	411	350	761	0	166	166	Y	Y	Y	Y
7:00 AM	409	344	753	0	169	169	Y	Y	Y	Y
12:00 PM	391	392	783	0	99	99	N	Y	Y	N
1:00 PM	367	404	771	0	92	92	N	Y	Y	N
11:00 AM	360	354	714	0	84	84	N	Y	Y	N
10:00 AM	298	322	620	0	89	89	N	Y	Y	N
9:00 AM	279	328	607	0	92	92	N	Y	Y	N

Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:

Major Street Lanes: 1
Minor Street Lanes: 1

CONDITION A - Minimum Vehicular Volume

Minimum Volume on Combined Major Street Approaches:	350
Minimum Volume on Higher Minor Street Approach:	105

CONDITION B - Interruption of Continuous Traffic

Minimum Volume on Combined Major Street Approaches:	525
Minimum Volume on Higher Minor Street Approach:	53

IS CONDITION A OF SIGNAL WARRANT 1 MET?	**NO**
IS CONDITION B OF SIGNAL WARRANT 1 MET?	**YES**
IS COMBINATION OF A OR B MET?	**YES**
IS 80% OF CONDITION A AND CONDITION B MET?	**NO**

Note: Signal Warrant 1 is met if either Condition A or Condition B is met.

WARRANT 2, FOUR HOUR VEHICULAR VOLUME

	MAJOR			MINOR			Calculated	
	NB	SB	Total	EB	WB	Max	Threshold	
4:00 PM	797	866	1,663	0	125	125	60	Y
5:00 PM	789	787	1,576	0	185	185	60	Y
3:00 PM	397	718	1,115	0	130	130	60	Y
2:00 PM	446	516	962	0	112	112	60	Y
6:00 PM	393	492	885	0	135	135	60	Y
8:00 AM	411	350	761	0	166	166	60	Y
7:00 AM	409	344	753	0	169	169	61	Y
12:00 PM	391	392	783	0	99	99	60	Y

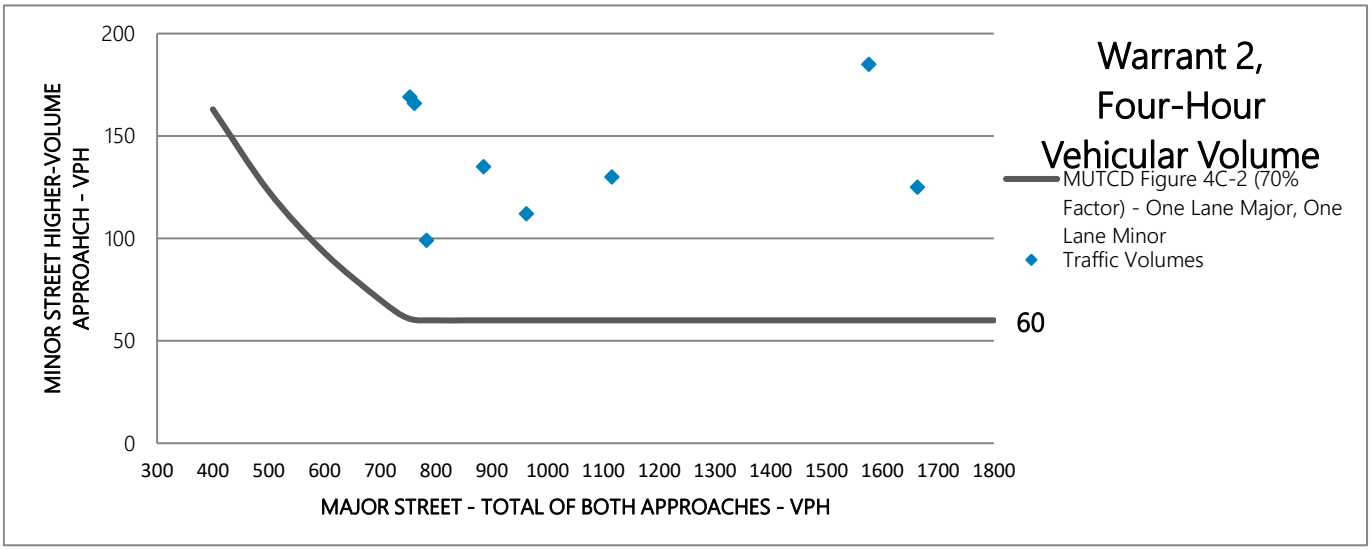
Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:

Major Street Lanes: 1

Minor Street Lanes: 1

IS SIGNAL WARRANT 2 MET? YES



WARRANT 3, PEAK HOUR VEHICULAR VOLUME

	MAJOR			MINOR			Calculated		
	NB	SB	Total	EB	WB	Max	Threshold (B	A-2&3	B
4:00 PM	797	866	1,663	0	125	125	75	Y	Y
5:00 PM	789	787	1,576	0	185	185	75	Y	Y
3:00 PM	397	718	1,115	0	130	130	75	Y	Y
2:00 PM	446	516	962	0	112	112	81	Y	Y

Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:
Major Street Lanes: 1
Minor Street Lanes: 1

CONDITION A-1 - Stopped Delay
Cannot be evaluated based on volumes alone. Condition met if traffic on one minor-street approach (one direction only) controlled by STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach.

CONDITION A-2 - Minor Street Volume
Minimum Volume on Higher Minor Street Approach: 100

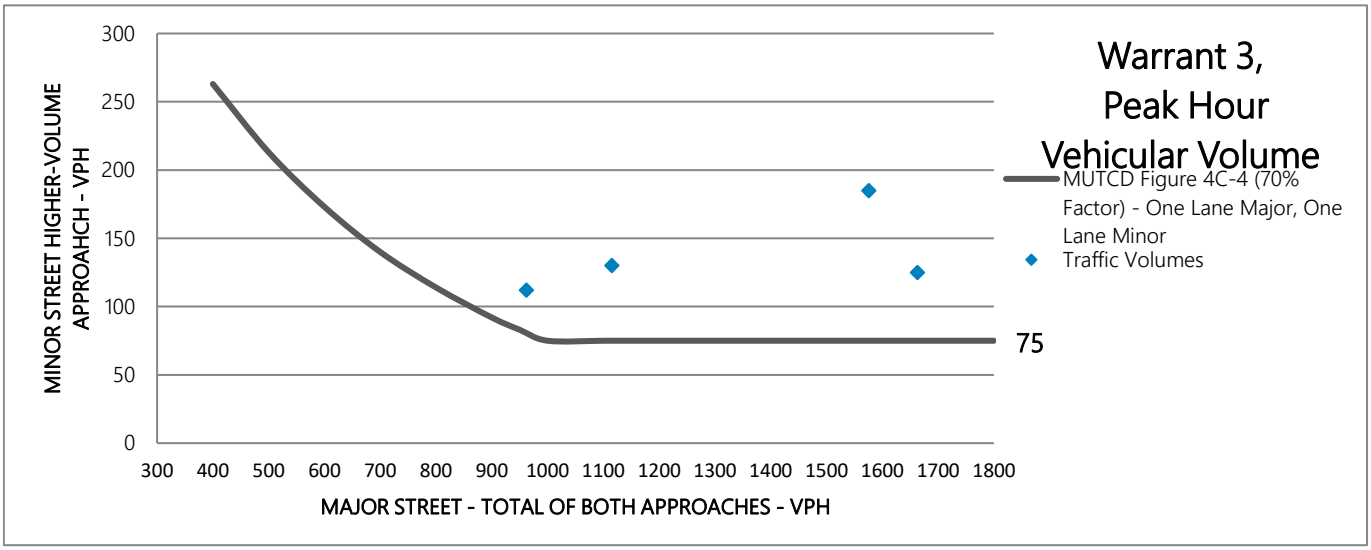
CONDITION A-3 - Total Approach Volume
Minimum Volume of Total Approaches: 650

CONDITION B - Plot of Minor Street Volume (high vol approach) vs. Major Street Volume (Both approaches)

ARE CONDITIONS A-2 AND A-3 OF SIGNAL WARRANT 3 MET? **YES** *Stopped Delay Needs to be Checked*
Note: All 3 subsections of Condition A must be met to warrant signal.

IS CONDITION B OF SIGNAL WARRANT 3 MET? **YES**

Note: Signal Warrant 3 is met if either Condition A or Condition B is met.



INTERSECTION INFORMATION

City:	Tualatin		Condition:	2026 Buildout Condition with BCP Extension Separate Right-Turn Lane	
Population:	25000				
Intersection Location:					
(Rural/Urban)	Urban			Right-Turn Reduction	100%
Major Street Name:	Boones Ferry Road		Minor Street Name:	Norwood Road	
Number of Moving Lanes for Each	1		Number of Moving Lanes for Each	1	
Speed:	45 mph		Speed:	45 mph	
Street Width:	48 ft		Street Width:	32 ft	

Direction:	NB	SB	Direction:	EB	WB		
Hour Beginning:			Hour Beginning:				
12:00 AM			12:00 AM				
1:00 AM			1:00 AM				
2:00 AM			2:00 AM				
3:00 AM			3:00 AM				
4:00 AM			4:00 AM				
5:00 AM			5:00 AM				
6:00 AM			6:00 AM			WB LT	WB RT
7:00 AM	409	344	7:00 AM	0	100	100	137
8:00 AM	411	350	8:00 AM	0	84	84	164
9:00 AM	279	328	9:00 AM	0	51	51	82
10:00 AM	298	322	10:00 AM	0	54	54	69
11:00 AM	360	354	11:00 AM	0	51	51	65
12:00 PM	391	392	12:00 PM	0	58	58	81
1:00 PM	367	404	1:00 PM	0	52	52	79
2:00 PM	446	516	2:00 PM	0	66	66	91
3:00 PM	397	718	3:00 PM	0	60	60	139
4:00 PM	797	866	4:00 PM	0	68	68	113
5:00 PM	789	787	5:00 PM	0	98	98	174
6:00 PM	393	492	6:00 PM	0	72	72	125
7:00 PM			7:00 PM				
8:00 PM			8:00 PM				
9:00 PM			9:00 PM				
10:00 PM			10:00 PM				
11:00 PM			11:00 PM				
24-hour Total	5,337	5,873	24-hour Total	0	814		

Warrants Evaluted:

Warrant 1, 8-Hour Vehicular Volume - Evaluated for Conditions A & B
Warrant 2 , 4-Hour Vehicular Volume - Evaluated
Warrant 3, Peak Hour - Evaluated for Conditions A-2, A-3 (A-1 needs to be evaluated separately), and Condition B
Warrant 4, Pedestrian Volume - Not Analyzed
Warrant 5, School Crossing - Not Analyzed
Warrant 6, Coordinated Signal System - Not Analyzed
Warrant 7, Accident Experience - Not Analyzed
Warrant 8, Roadway Network - Not Analyzed
Warrant 9, Intersection Near a Grade Crossing - Not Analyzed

WARRANT 1, 8-HOUR VEHICULAR VOLUME

	MAJOR			MINOR						
	NB	SB	Total	EB	WB	Max	A	B	A or B	80% A&B
4:00 PM	797	866	1,663	0	68	68	N	Y	Y	N
5:00 PM	789	787	1,576	0	98	98	N	Y	Y	N
3:00 PM	397	718	1,115	0	60	60	N	Y	Y	N
2:00 PM	446	516	962	0	66	66	N	Y	Y	N
6:00 PM	393	492	885	0	72	72	N	Y	Y	N
7:00 AM	409	344	753	0	100	100	N	Y	Y	N
8:00 AM	411	350	761	0	84	84	N	Y	Y	N
12:00 PM	391	392	783	0	58	58	N	Y	Y	N
1:00 PM	367	404	771	0	52	52	N	N	N	N
11:00 AM	360	354	714	0	51	51	N	N	N	N
10:00 AM	298	322	620	0	54	54	N	Y	Y	N
9:00 AM	279	328	607	0	51	51	N	N	N	N

Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:

Major Street Lanes: 1
Minor Street Lanes: 1

CONDITION A - Minimum Vehicular Volume

Minimum Volume on Combined Major Street Approaches:	350
Minimum Volume on Higher Minor Street Approach:	105

CONDITION B - Interruption of Continuous Traffic

Minimum Volume on Combined Major Street Approaches:	525
Minimum Volume on Higher Minor Street Approach:	53

IS CONDITION A OF SIGNAL WARRANT 1 MET?	**NO**
IS CONDITION B OF SIGNAL WARRANT 1 MET?	**YES**
IS COMBINATION OF A OR B MET?	**YES**
IS 80% OF CONDITION A AND CONDITION B MET?	**NO**

Note: Signal Warrant 1 is met if either Condition A or Condition B is met.

WARRANT 2, FOUR HOUR VEHICULAR VOLUME

	MAJOR			MINOR			Calculated	
	NB	SB	Total	EB	WB	Max	Threshold	
4:00 PM	797	866	1,663	0	68	68	60	Y
5:00 PM	789	787	1,576	0	98	98	60	Y
3:00 PM	397	718	1,115	0	60	60	60	Y
2:00 PM	446	516	962	0	66	66	60	Y
6:00 PM	393	492	885	0	72	72	60	Y
7:00 AM	409	344	753	0	100	100	61	Y
8:00 AM	411	350	761	0	84	84	60	Y
12:00 PM	391	392	783	0	58	58	60	N

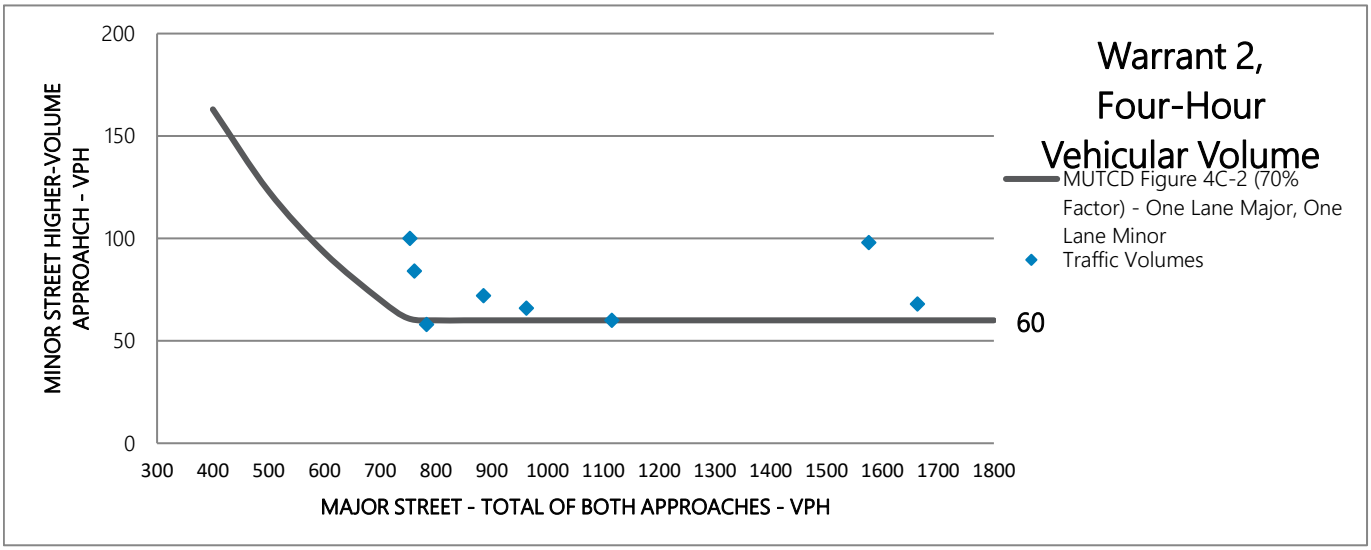
Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:

Major Street Lanes: 1

Minor Street Lanes: 1

IS SIGNAL WARRANT 2 MET? YES



WARRANT 3, PEAK HOUR VEHICULAR VOLUME

	MAJOR			MINOR			Calculated		
	NB	SB	Total	EB	WB	Max	Threshold (B	A-2&3	B
4:00 PM	797	866	1,663	0	68	68	75	N	N
5:00 PM	789	787	1,576	0	98	98	75	N	Y
3:00 PM	397	718	1,115	0	60	60	75	N	N
2:00 PM	446	516	962	0	66	66	81	N	N

Note: The major street has a speed which exceeds 40 mph, therefore these minimum volumes are 70 percent of the regular requirements

Warrant Requirements:
Major Street Lanes: 1
Minor Street Lanes: 1

CONDITION A-1 - Stopped Delay
Cannot be evaluated based on volumes alone. Condition met if traffic on one minor-street approach (one direction only) controlled by STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach.

CONDITION A-2 - Minor Street Volume
Minimum Volume on Higher Minor Street Approach: 100

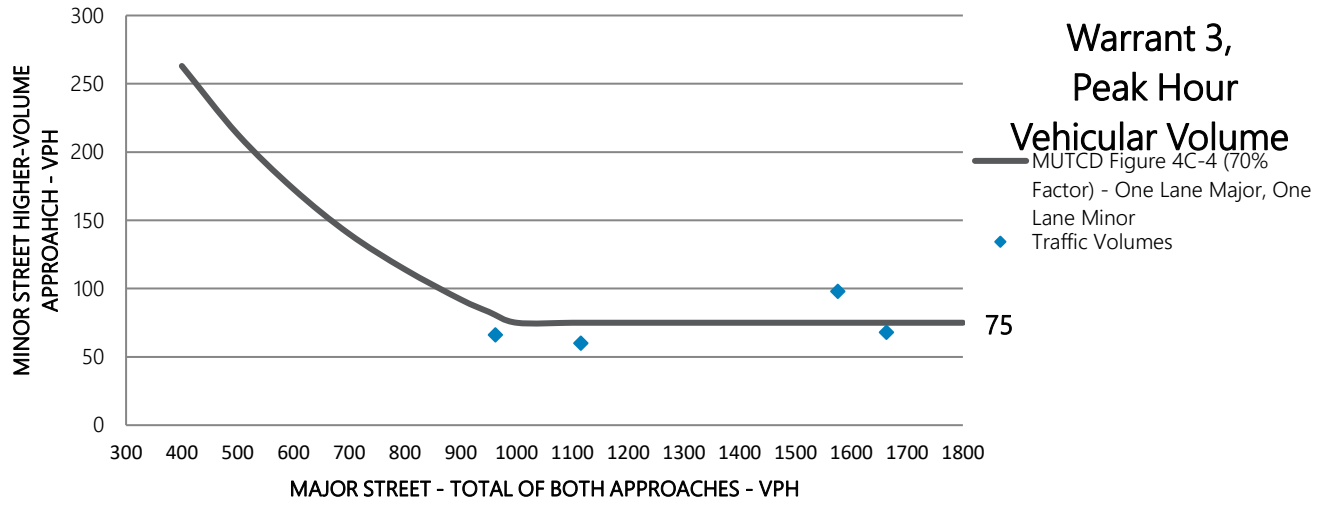
CONDITION A-3 - Total Approach Volume
Minimum Volume of Total Approaches: 650

CONDITION B - Plot of Minor Street Volume (high vol approach) vs. Major Street Volume (Both approaches)

ARE CONDITIONS A-2 AND A-3 OF SIGNAL WARRANT 3 MET? NO
Note: All 3 subsections of Condition A must be met to warrant signal.

IS CONDITION B OF SIGNAL WARRANT 3 MET? YES

Note: Signal Warrant 3 is met if either Condition A or Condition B is met.



Appendix D - Operations

Definitions

Synchro Reports

Queuing Reports

Level of Service Definitions

Level of service is used to describe the quality of traffic flow. Levels of service A to C are considered good, and rural roads are usually designed for level of service C. Urban streets and signalized intersections are typically designed for level of service D. Level of service E is considered to be the limit of acceptable delay. For unsignalized intersections, level of service E is generally considered acceptable. Here is a more complete description of levels of service:

- *Level of service A:* Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.
- *Level of service B:* Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.
- *Level of service C:* Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.
- *Level of service D:* Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.
- *Level of service E:* Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.
- *Level of service F:* Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.

Level of Service Criteria
For Signalized Intersections

Level of Service (LOS)	Control Delay per Vehicle (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

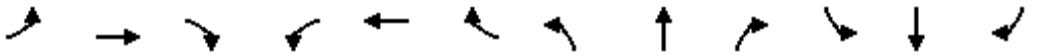
Level of Service Criteria
For Unsignalized Intersections

Level of Service (LOS)	Control Delay per Vehicle (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50

2022 Existing Conditions

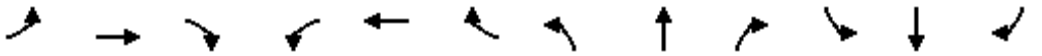
AM Peak Hour Synchro Reports

PM Peak Hour Synchro Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	216	1	263	2	1	15	151	469	5	6	471	102
Future Volume (vph)	216	1	263	2	1	15	151	469	5	6	471	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.92			0.95		1.00	1.00		1.00	1.00	0.91
Flpb, ped/bikes	0.96	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85			0.88		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1694	1472			1576		1787	1840		1805	1827	1429
Flt Permitted	0.74	1.00			0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1325	1472			1543		1787	1840		1805	1827	1429
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	267	1	325	2	1	19	186	579	6	7	581	126
RTOR Reduction (vph)	0	240	0	0	14	0	0	0	0	0	0	47
Lane Group Flow (vph)	267	86	0	0	8	0	186	585	0	7	581	79
Confl. Peds. (#/hr)	24		26	26		24	8		28	28		28
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	1%	3%	0%	0%	4%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	20.5	20.5			20.5		11.4	45.4		1.0	35.0	35.0
Effective Green, g (s)	21.0	21.0			21.0		11.4	46.4		1.0	36.0	36.0
Actuated g/C Ratio	0.26	0.26			0.26		0.14	0.58		0.01	0.45	0.45
Clearance Time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.3	2.3			2.5		2.3	4.3		2.3	4.3	4.3
Lane Grp Cap (vph)	346	384			403		253	1061		22	818	639
v/s Ratio Prot		0.06					c0.10	0.32		0.00	c0.32	
v/s Ratio Perm	c0.20				0.01							0.05
v/c Ratio	0.77	0.22			0.02		0.74	0.55		0.32	0.71	0.12
Uniform Delay, d1	27.5	23.3			22.1		33.1	10.5		39.4	18.0	13.0
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.6	0.2			0.0		9.7	0.9		4.8	3.3	0.1
Delay (s)	37.1	23.5			22.1		42.7	11.4		44.2	21.2	13.1
Level of Service	D	C			C		D	B		D	C	B
Approach Delay (s)		29.6			22.1			19.0			20.0	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	80.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	216	1	263	2	1	15	151	469	5	6	471	102
Future Volume (veh/h)	216	1	263	2	1	15	151	469	5	6	471	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.95		0.95	0.97		0.95	1.00		0.97	1.00		0.94
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	1870	1900	1885	1900	1900	1900	1885	1856	1900	1900	1841	1856
Adj Flow Rate, veh/h	267	1	165	2	1	13	186	579	6	7	581	77
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	2	0	1	0	0	0	1	3	0	0	4	3
Cap, veh/h	462	2	393	85	55	325	233	995	10	13	774	623
Arrive On Green	0.26	0.26	0.25	0.25	0.26	0.25	0.13	0.54	0.53	0.01	0.42	0.42
Sat Flow, veh/h	1332	9	1519	79	211	1257	1795	1833	19	1810	1841	1483
Grp Volume(v), veh/h	267	0	166	16	0	0	186	0	585	7	581	77
Grp Sat Flow(s),veh/h/ln	1332	0	1529	1547	0	0	1795	0	1852	1810	1841	1483
Q Serve(g_s), s	11.0	0.0	5.7	0.0	0.0	0.0	6.3	0.0	13.3	0.2	16.8	2.0
Cycle Q Clear(g_c), s	11.5	0.0	5.7	0.5	0.0	0.0	6.3	0.0	13.3	0.2	16.8	2.0
Prop In Lane	1.00		0.99	0.12		0.81	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	462	0	396	453	0	0	233	0	1005	13	774	623
V/C Ratio(X)	0.58	0.00	0.42	0.04	0.00	0.00	0.80	0.00	0.58	0.53	0.75	0.12
Avail Cap(c_a), veh/h	668	0	632	601	0	0	314	0	1650	317	1640	1321
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	0.0	19.6	17.6	0.0	0.0	26.6	0.0	9.6	31.1	15.4	11.1
Incr Delay (d2), s/veh	0.7	0.0	0.4	0.0	0.0	0.0	8.2	0.0	0.9	18.5	2.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	1.9	0.2	0.0	0.0	3.0	0.0	4.4	0.2	6.5	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.2	0.0	20.0	17.6	0.0	0.0	34.7	0.0	10.5	49.6	17.8	11.3
LnGrp LOS	C	A	C	B	A	A	C	A	B	D	B	B
Approach Vol, veh/h		433			16			771			665	
Approach Delay, s/veh		21.3			17.6			16.3			17.4	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	38.1		20.3	12.2	30.4		20.3				
Change Period (Y+Rc), s	4.0	5.0		4.5	4.0	5.0		4.5				
Max Green Setting (Gmax), s	11.0	55.0		25.5	11.0	55.0		22.0				
Max Q Clear Time (g_c+I1), s	2.2	15.3		13.5	8.3	18.8		2.5				
Green Ext Time (p_c), s	0.0	6.2		1.5	0.2	6.6		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		17.9	
HCM 6th LOS		B	

Intersection	
Int Delay, s/veh	3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	54	88	359	25	46	274
Future Vol, veh/h	54	88	359	25	46	274
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	65	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	3	3	1	8	4	1
Mvmt Flow	67	109	443	31	57	338

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	895	445	0	0	474	0
Stage 1	443	-	-	-	-	-
Stage 2	452	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.14	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.236	-
Pot Cap-1 Maneuver	310	611	-	-	1078	-
Stage 1	645	-	-	-	-	-
Stage 2	639	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	294	610	-	-	1078	-
Mov Cap-2 Maneuver	419	-	-	-	-	-
Stage 1	645	-	-	-	-	-
Stage 2	605	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.4	0	1.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	520	1078	-
HCM Lane V/C Ratio	-	-	0.337	0.053	-
HCM Control Delay (s)	-	-	15.4	8.5	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1.5	0.2	-

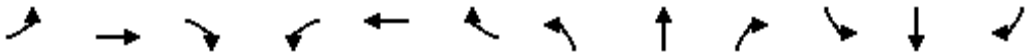
Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	122	0	8	0	0	0	23	2	0	0	0	104
Future Vol, veh/h	122	0	8	0	0	0	23	2	0	0	0	104
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	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	0	0	0	0	0	4	0	0	0	0	0
Mvmt Flow	156	0	10	0	0	0	29	3	0	0	0	133

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	10	0	0	318	318	5	320	323	-
Stage 1	-	-	-	-	-	-	317	317	-	1	1	-
Stage 2	-	-	-	-	-	-	1	1	-	319	322	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.14	6.5	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.2	-	-	3.536	4	3.3	3.5	4	-
Pot Cap-1 Maneuver	1622	-	-	1623	-	-	631	602	1084	637	598	0
Stage 1	-	-	-	-	-	-	690	658	-	1027	899	0
Stage 2	-	-	-	-	-	-	1017	899	-	697	655	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1622	-	-	1623	-	-	584	544	1084	587	540	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	584	544	-	587	540	-
Stage 1	-	-	-	-	-	-	623	594	-	927	899	-
Stage 2	-	-	-	-	-	-	1017	899	-	627	591	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	7	0	11.6	0
HCM LOS			B	A

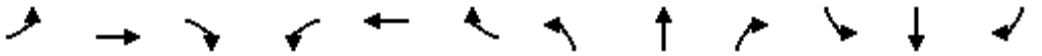
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	581	1622	-	-	1623	-	-	-	-
HCM Lane V/C Ratio	0.055	0.096	-	-	-	-	-	-	-
HCM Control Delay (s)	11.6	7.5	0	-	0	-	-	0	0
HCM Lane LOS	B	A	A	-	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	0.3	-	-	0	-	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	0	484	0	0	0	504	412	0	0	269	20
Future Volume (vph)	30	0	484	0	0	0	504	412	0	0	269	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.3	4.7				4.9	4.0			4.0	
Lane Util. Factor		1.00	1.00				*0.85	1.00			0.95	
Frpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Flpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	1.00			0.99	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1703	1495				2868	1881			3493	
Flt Permitted		0.76	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1357	1495				2868	1881			3493	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	35	0	563	0	0	0	586	479	0	0	313	23
RTOR Reduction (vph)	0	0	198	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	35	365	0	0	0	586	479	0	0	332	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	6%	0%	8%	0%	0%	0%	7%	1%	0%	0%	2%	5%
Turn Type	Perm	NA	pm+ov				Prot	NA		Prot	NA	
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Actuated Green, G (s)		6.3	31.1				24.8	78.8			48.6	
Effective Green, g (s)		6.5	32.5				25.3	80.2			50.0	
Actuated g/C Ratio		0.07	0.34				0.27	0.84			0.53	
Clearance Time (s)		4.5	5.4				5.4	5.4			5.4	
Vehicle Extension (s)		2.5	2.3				2.3	4.4			4.4	
Lane Grp Cap (vph)		92	511				763	1587			1838	
v/s Ratio Prot			c0.19				c0.20	c0.25			0.10	
v/s Ratio Perm		0.03	0.05									
v/c Ratio		0.38	0.71				0.77	0.30			0.18	
Uniform Delay, d1		42.3	27.2				32.1	1.5			11.8	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		1.9	4.2				4.4	0.5			0.2	
Delay (s)		44.2	31.4				36.5	2.0			12.0	
Level of Service		D	C				D	A			B	
Approach Delay (s)		32.2			0.0			21.0			12.0	
Approach LOS		C			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	13.2
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	0	484	0	0	0	504	412	0	0	269	20
Future Volume (veh/h)	30	0	484	0	0	0	504	412	0	0	269	20
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		0.99
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	1811	1900	1781	1900	1900	1900	1796	1885	1900	1900	1870	1826
Adj Flow Rate, veh/h	35	0	447	0	0	0	586	479	0	0	313	17
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	6	0	8	0	0	0	7	1	0	0	2	5
Cap, veh/h	314	0	629	0	320	0	710	599	0	684	1547	84
Arrive On Green	0.16	0.00	0.17	0.00	0.00	0.00	0.24	0.32	0.00	0.00	0.45	0.44
Sat Flow, veh/h	1440	0	1510	0	1900	0	2908	1885	0	1810	3426	185
Grp Volume(v), veh/h	35	0	447	0	0	0	586	479	0	0	162	168
Grp Sat Flow(s),veh/h/ln	1440	0	1510	0	1900	0	1454	1885	0	1810	1777	1834
Q Serve(g_s), s	2.0	0.0	16.2	0.0	0.0	0.0	18.1	22.1	0.0	0.0	5.2	5.3
Cycle Q Clear(g_c), s	2.0	0.0	16.2	0.0	0.0	0.0	18.1	22.1	0.0	0.0	5.2	5.3
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.00	1.00		0.10
Lane Grp Cap(c), veh/h	311	0	629	0	320	0	710	599	0	684	802	828
V/C Ratio(X)	0.11	0.00	0.71	0.00	0.00	0.00	0.82	0.80	0.00	0.00	0.20	0.20
Avail Cap(c_a), veh/h	311	0	629	0	320	0	1105	1151	0	684	802	828
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	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	34.0	0.0	22.9	0.0	0.0	0.0	34.0	29.7	0.0	0.0	15.7	15.8
Incr Delay (d2), s/veh	0.1	0.0	3.5	0.0	0.0	0.0	2.1	10.7	0.0	0.0	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	8.3	0.0	0.0	0.0	6.4	11.4	0.0	0.0	2.1	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.1	0.0	26.4	0.0	0.0	0.0	36.1	40.4	0.0	0.0	16.3	16.3
LnGrp LOS	C	A	C	A	A	A	D	D	A	A	B	B
Approach Vol, veh/h		482			0			1065			330	
Approach Delay, s/veh		27.0			0.0			38.0			16.3	
Approach LOS		C						D			B	

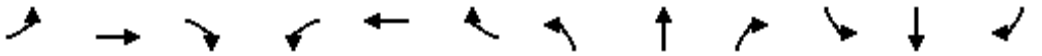
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	28.1	46.9		20.0	40.8	34.2		20.0				
Change Period (Y+Rc), s	* 5.4	* 5.4		4.5	* 5.4	* 5.4		4.5				
Max Green Setting (Gmax), s	* 36	* 29		15.5	* 8.5	* 57		15.5				
Max Q Clear Time (g_c+I1), s	20.1	7.3		0.0	0.0	24.1		18.2				
Green Ext Time (p_c), s	2.6	2.4		0.0	0.0	4.7		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		31.4	
HCM 6th LOS		C	

Notes

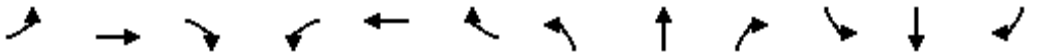
User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	3	143	1	1	11	163	596	3	5	608	239
Future Volume (vph)	177	3	143	1	1	11	163	596	3	5	608	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97			0.96		1.00	1.00		1.00	1.00	0.93
Flpb, ped/bikes	0.98	1.00			1.00		1.00	1.00		0.98	1.00	1.00
Frt	1.00	0.85			0.88		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1588	1413			1451		1624	1643		1587	1710	1356
Flt Permitted	0.75	1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1251	1413			1435		1624	1643		1587	1710	1356
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	192	3	155	1	1	12	177	648	3	5	661	260
RTOR Reduction (vph)	0	123	0	0	10	0	0	0	0	0	0	77
Lane Group Flow (vph)	192	35	0	0	4	0	177	651	0	5	661	183
Confl. Peds. (#/hr)	12		4	4		12	4		19	19		19
Confl. Bikes (#/hr)			1						2			2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	16.9	16.9			16.9		11.6	51.8		0.9	41.1	41.1
Effective Green, g (s)	16.9	16.9			16.9		11.6	51.8		0.9	41.1	41.1
Actuated g/C Ratio	0.20	0.20			0.20		0.14	0.62		0.01	0.49	0.49
Clearance Time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.3	2.3			2.5		2.3	4.3		2.3	4.3	4.3
Lane Grp Cap (vph)	254	287			291		226	1024		17	845	670
v/s Ratio Prot		0.02					c0.11	0.40		0.00	c0.39	
v/s Ratio Perm	c0.15				0.00							0.13
v/c Ratio	0.76	0.12			0.02		0.78	0.64		0.29	0.78	0.27
Uniform Delay, d1	31.2	27.0			26.5		34.5	9.8		40.8	17.3	12.3
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	11.2	0.1			0.0		15.3	1.6		5.6	5.2	0.4
Delay (s)	42.4	27.1			26.5		49.9	11.3		46.3	22.5	12.6
Level of Service	D	C			C		D	B		D	C	B
Approach Delay (s)		35.5			26.5			19.6			19.9	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	83.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	177	3	143	1	1	11	163	596	3	5	608	239
Future Volume (veh/h)	177	3	143	1	1	11	163	596	3	5	608	239
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.95	0.98		0.97	1.00		0.96	1.00		0.96
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	1710	1710	1710	1710	1710	1710	1710	1657	1710	1710	1710	1710
Adj Flow Rate, veh/h	192	3	79	1	1	12	177	648	3	5	661	173
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, %	0	0	0	0	0	0	0	4	0	0	0	0
Cap, veh/h	353	10	265	60	36	243	214	993	5	9	815	662
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.13	0.60	0.60	0.01	0.48	0.48
Sat Flow, veh/h	1244	51	1334	25	180	1228	1629	1647	8	1629	1710	1390
Grp Volume(v), veh/h	192	0	82	14	0	0	177	0	651	5	661	173
Grp Sat Flow(s),veh/h/ln	1244	0	1385	1433	0	0	1629	0	1655	1629	1710	1390
Q Serve(g_s), s	9.5	0.0	3.5	0.0	0.0	0.0	7.4	0.0	18.0	0.2	23.0	5.2
Cycle Q Clear(g_c), s	10.0	0.0	3.5	0.5	0.0	0.0	7.4	0.0	18.0	0.2	23.0	5.2
Prop In Lane	1.00		0.96	0.07		0.86	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	353	0	275	339	0	0	214	0	998	9	815	662
V/C Ratio(X)	0.54	0.00	0.30	0.04	0.00	0.00	0.83	0.00	0.65	0.58	0.81	0.26
Avail Cap(c_a), veh/h	561	0	506	574	0	0	257	0	1305	257	1349	1096
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.4	0.0	23.8	22.6	0.0	0.0	29.5	0.0	9.1	34.6	15.6	10.9
Incr Delay (d2), s/veh	0.8	0.0	0.4	0.0	0.0	0.0	15.4	0.0	1.2	32.4	3.1	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	2.9	0.0	1.1	0.2	0.0	0.0	3.6	0.0	5.2	0.2	8.3	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.2	0.0	24.2	22.7	0.0	0.0	44.9	0.0	10.2	67.0	18.7	11.2
LnGrp LOS	C	A	C	C	A	A	D	A	B	E	B	B
Approach Vol, veh/h		274			14			828			839	
Approach Delay, s/veh		26.3			22.7			17.6			17.5	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.4	47.0		18.3	13.2	38.2		18.3				
Change Period (Y+Rc), s	4.0	5.0		4.5	4.0	5.0		4.5				
Max Green Setting (Gmax), s	11.0	55.0		25.5	11.0	55.0		25.5				
Max Q Clear Time (g_c+I1), s	2.2	20.0		12.0	9.4	25.0		2.5				
Green Ext Time (p_c), s	0.0	7.0		1.0	0.1	8.2		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		18.8	
HCM 6th LOS		B	

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	32	87	502	83	77	552
Future Vol, veh/h	32	87	502	83	77	552
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	65	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	0	0	0	0	0
Mvmt Flow	35	96	552	91	85	607

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1329	552	0	0	643	0
Stage 1	552	-	-	-	-	-
Stage 2	777	-	-	-	-	-
Critical Hdwy	6.42	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	171	537	-	-	951	-
Stage 1	577	-	-	-	-	-
Stage 2	453	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	156	537	-	-	951	-
Mov Cap-2 Maneuver	288	-	-	-	-	-
Stage 1	577	-	-	-	-	-
Stage 2	413	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.8	0	1.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	436	951	-
HCM Lane V/C Ratio	-	-	0.3	0.089	-
HCM Control Delay (s)	-	-	16.8	9.2	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1.2	0.3	-

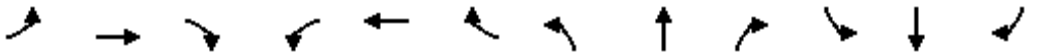
Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↕	↱
Traffic Vol, veh/h	93	0	23	0	0	0	20	3	0	0	4	107
Future Vol, veh/h	93	0	23	0	0	0	20	3	0	0	4	107
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	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	1	0	0	0	0	0	5	0	0	0	0	0
Mvmt Flow	102	0	25	0	0	0	22	3	0	0	4	118

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	25	0	0	220	218	13	219	230	-
Stage 1	-	-	-	-	-	-	217	217	-	1	1	-
Stage 2	-	-	-	-	-	-	3	1	-	218	229	-
Critical Hdwy	4.11	-	-	4.1	-	-	7.15	6.5	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.2	-	-	3.545	4	3.3	3.5	4	-
Pot Cap-1 Maneuver	1628	-	-	1603	-	-	730	684	1073	741	673	0
Stage 1	-	-	-	-	-	-	779	727	-	1027	899	0
Stage 2	-	-	-	-	-	-	1012	899	-	789	718	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1628	-	-	1603	-	-	691	640	1073	702	630	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	691	640	-	702	630	-
Stage 1	-	-	-	-	-	-	729	680	-	961	899	-
Stage 2	-	-	-	-	-	-	1007	899	-	735	672	-

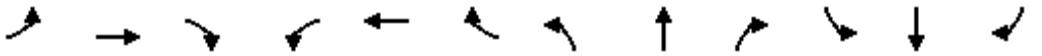
Approach	EB	WB	NB	SB
HCM Control Delay, s	5.9	0	10.5	10.8
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	684	1628	-	-	1603	-	-	630	-
HCM Lane V/C Ratio	0.037	0.063	-	-	-	-	-	0.007	-
HCM Control Delay (s)	10.5	7.4	0	-	0	-	-	10.8	0
HCM Lane LOS	B	A	A	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	0	545	0	0	0	540	540	0	0	551	21
Future Volume (vph)	16	0	545	0	0	0	540	540	0	0	551	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0				4.0	4.0			4.0	
Lane Util. Factor		1.00	1.00				*0.85	1.00			0.95	
Frpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Flpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	1.00			0.99	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1802	1583				2895	1900			3585	
Flt Permitted		0.80	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1518	1583				2895	1900			3585	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	18	0	599	0	0	0	593	593	0	0	605	23
RTOR Reduction (vph)	0	0	58	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	18	541	0	0	0	593	593	0	0	626	0
Confl. Peds. (#/hr)	1					1						
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	6%	0%	0%	0%	0%	4%
Turn Type	Perm	NA	pm+ov				Prot	NA		Prot	NA	
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Actuated Green, G (s)		4.5	40.4				35.9	90.6			49.3	
Effective Green, g (s)		5.0	43.2				37.3	92.0			50.7	
Actuated g/C Ratio		0.05	0.41				0.36	0.88			0.48	
Clearance Time (s)		4.5	5.4				5.4	5.4			5.4	
Vehicle Extension (s)		2.5	2.3				2.3	4.4			4.4	
Lane Grp Cap (vph)		72	651				1028	1664			1731	
v/s Ratio Prot			c0.30				0.20	c0.31			0.17	
v/s Ratio Perm		0.01	0.05									
v/c Ratio		0.25	0.83				0.58	0.36			0.36	
Uniform Delay, d1		48.2	27.6				27.5	1.2			17.0	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		1.3	8.6				0.6	0.6			0.6	
Delay (s)		49.5	36.3				28.0	1.8			17.6	
Level of Service		D	D				C	A			B	
Approach Delay (s)		36.7			0.0			14.9			17.6	
Approach LOS		D			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	545	0	0	0	540	540	0	0	551	21
Future Volume (veh/h)	16	0	545	0	0	0	540	540	0	0	551	21
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	1900	1900	1870	1900	1900	1900	1811	1900	1900	1900	1900	1841
Adj Flow Rate, veh/h	18	0	539	0	0	0	593	593	0	0	605	23
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	2	0	0	0	6	0	0	0	0	4
Cap, veh/h	274	0	635	0	271	0	732	715	0	631	1749	66
Arrive On Green	0.14	0.00	0.15	0.00	0.00	0.00	0.25	0.38	0.00	0.00	0.49	0.48
Sat Flow, veh/h	1435	0	1582	0	1900	0	2932	1900	0	1810	3546	135
Grp Volume(v), veh/h	18	0	539	0	0	0	593	593	0	0	308	320
Grp Sat Flow(s),veh/h/ln	1435	0	1582	0	1900	0	1466	1900	0	1810	1805	1876
Q Serve(g_s), s	1.1	0.0	15.9	0.0	0.0	0.0	20.0	29.7	0.0	0.0	10.9	11.0
Cycle Q Clear(g_c), s	1.1	0.0	15.9	0.0	0.0	0.0	20.0	29.7	0.0	0.0	10.9	11.0
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.00	1.00		0.07
Lane Grp Cap(c), veh/h	267	0	635	0	271	0	732	715	0	631	890	925
V/C Ratio(X)	0.07	0.00	0.85	0.00	0.00	0.00	0.81	0.83	0.00	0.00	0.35	0.35
Avail Cap(c_a), veh/h	267	0	635	0	271	0	1201	1249	0	631	890	925
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	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	39.3	0.0	28.6	0.0	0.0	0.0	37.1	29.7	0.0	0.0	16.2	16.3
Incr Delay (d2), s/veh	0.1	0.0	10.3	0.0	0.0	0.0	1.4	10.8	0.0	0.0	1.1	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	13.4	0.0	0.0	0.0	7.1	15.2	0.0	0.0	4.4	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.4	0.0	38.9	0.0	0.0	0.0	38.4	40.5	0.0	0.0	17.3	17.3
LnGrp LOS	D	A	D	A	A	A	D	D	A	A	B	B
Approach Vol, veh/h		557			0			1186			628	
Approach Delay, s/veh		38.9			0.0			39.4			17.3	
Approach LOS		D						D			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	30.2	55.8		19.0	42.5	43.5		19.0				
Change Period (Y+Rc), s	* 5.4	* 5.4		4.5	* 5.4	* 5.4		4.5				
Max Green Setting (Gmax), s	* 42	* 34		14.5	* 8.5	* 68		14.5				
Max Q Clear Time (g_c+I1), s	22.0	13.0		0.0	0.0	31.7		17.9				
Green Ext Time (p_c), s	2.8	4.9		0.0	0.0	6.4		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	33.5
HCM 6th LOS	C

Notes

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

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

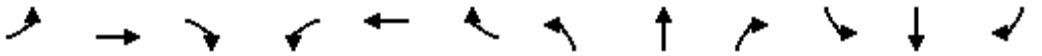
2026 Background Conditions
No Basalt Creek Parkway Extension

AM Peak Hour Synchro Reports

PM Peak Hour Synchro Reports

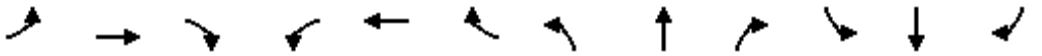
AM Peak Hour Queuing Reports

PM Peak Hour Queuing Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	233	1	287	2	1	16	173	565	5	6	516	110
Future Volume (vph)	233	1	287	2	1	16	173	565	5	6	516	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.92			0.94		1.00	1.00		1.00	1.00	0.91
Flpb, ped/bikes	0.95	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85			0.88		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1689	1464			1570		1787	1841		1805	1827	1421
Flt Permitted	0.74	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1319	1464			1538		1787	1841		1805	1827	1421
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	288	1	354	2	1	20	214	698	6	7	637	136
RTOR Reduction (vph)	0	254	0	0	15	0	0	0	0	0	0	46
Lane Group Flow (vph)	288	101	0	0	8	0	214	704	0	7	637	90
Confl. Peds. (#/hr)	24		26	26		24	8		28	28		28
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	1%	3%	0%	0%	4%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	22.6	22.6			22.6		11.3	49.5		1.0	39.2	39.2
Effective Green, g (s)	23.1	23.1			23.1		11.3	50.5		1.0	40.2	40.2
Actuated g/C Ratio	0.27	0.27			0.27		0.13	0.58		0.01	0.46	0.46
Clearance Time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.3	2.3			2.5		2.3	4.3		2.3	4.3	4.3
Lane Grp Cap (vph)	351	390			410		233	1073		20	848	659
v/s Ratio Prot		0.07					c0.12	0.38		0.00	c0.35	
v/s Ratio Perm	c0.22				0.01							0.06
v/c Ratio	0.82	0.26			0.02		0.92	0.66		0.35	0.75	0.14
Uniform Delay, d1	29.8	25.0			23.4		37.2	12.2		42.5	19.1	13.3
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	13.8	0.2			0.0		36.9	1.7		6.1	4.2	0.2
Delay (s)	43.6	25.2			23.4		74.0	13.9		48.6	23.2	13.4
Level of Service	D	C			C		E	B		D	C	B
Approach Delay (s)		33.4			23.4			27.9			21.8	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	86.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	233	1	287	2	1	16	173	565	5	6	516	110
Future Volume (veh/h)	233	1	287	2	1	16	173	565	5	6	516	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.95		0.95	0.97		0.95	1.00		0.97	1.00		0.94
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	1870	1900	1885	1900	1900	1900	1885	1856	1900	1900	1841	1856
Adj Flow Rate, veh/h	288	1	181	2	1	14	214	698	6	7	637	87
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	2	0	1	0	0	0	1	3	0	0	4	3
Cap, veh/h	442	2	390	75	50	326	255	1052	9	13	806	650
Arrive On Green	0.26	0.26	0.25	0.25	0.26	0.25	0.14	0.57	0.56	0.01	0.44	0.44
Sat Flow, veh/h	1330	8	1520	77	195	1270	1795	1836	16	1810	1841	1485
Grp Volume(v), veh/h	288	0	182	17	0	0	214	0	704	7	637	87
Grp Sat Flow(s),veh/h/ln	1330	0	1528	1542	0	0	1795	0	1852	1810	1841	1485
Q Serve(g_s), s	14.3	0.0	7.4	0.0	0.0	0.0	8.5	0.0	19.2	0.3	21.8	2.6
Cycle Q Clear(g_c), s	14.9	0.0	7.4	0.6	0.0	0.0	8.5	0.0	19.2	0.3	21.8	2.6
Prop In Lane	1.00		0.99	0.12		0.82	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	442	0	392	440	0	0	255	0	1061	13	806	650
V/C Ratio(X)	0.65	0.00	0.46	0.04	0.00	0.00	0.84	0.00	0.66	0.53	0.79	0.13
Avail Cap(c_a), veh/h	573	0	542	515	0	0	269	0	1415	271	1406	1135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.7	0.0	23.2	20.7	0.0	0.0	30.6	0.0	10.8	36.3	17.7	12.3
Incr Delay (d2), s/veh	1.0	0.0	0.5	0.0	0.0	0.0	18.8	0.0	1.1	19.0	2.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	2.6	0.2	0.0	0.0	4.8	0.0	6.7	0.2	8.8	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	0.0	23.8	20.7	0.0	0.0	49.4	0.0	11.9	55.3	20.5	12.4
LnGrp LOS	C	A	C	C	A	A	D	A	B	E	C	B
Approach Vol, veh/h		470			17			918			731	
Approach Delay, s/veh		25.6			20.7			20.7			19.9	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	46.0		22.8	14.4	36.1		22.8				
Change Period (Y+Rc), s	4.0	5.0		4.5	4.0	5.0		4.5				
Max Green Setting (Gmax), s	11.0	55.0		25.5	11.0	55.0		22.0				
Max Q Clear Time (g_c+I1), s	2.3	21.2		16.9	10.5	23.8		2.6				
Green Ext Time (p_c), s	0.0	7.8		1.4	0.0	7.3		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		21.5	
HCM 6th LOS		C	

Intersection	
Int Delay, s/veh	4.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	70	136	426	36	64	302
Future Vol, veh/h	70	136	426	36	64	302
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	65	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	3	3	1	8	4	1
Mvmt Flow	86	168	526	44	79	373

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1057	528	0	0	570	0
Stage 1	526	-	-	-	-	-
Stage 2	531	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.14	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.236	-
Pot Cap-1 Maneuver	248	548	-	-	993	-
Stage 1	591	-	-	-	-	-
Stage 2	588	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	228	547	-	-	993	-
Mov Cap-2 Maneuver	362	-	-	-	-	-
Stage 1	591	-	-	-	-	-
Stage 2	541	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.6	0	1.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	466	993	-
HCM Lane V/C Ratio	-	-	0.546	0.08	-
HCM Control Delay (s)	-	-	21.6	8.9	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	3.2	0.3	-

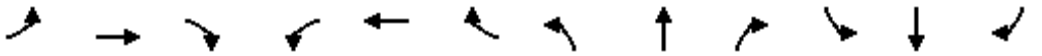
Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	167	0	9	0	0	0	25	2	0	0	0	123
Future Vol, veh/h	167	0	9	0	0	0	25	2	0	0	0	123
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	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	0	0	0	0	0	4	0	0	0	0	0
Mvmt Flow	214	0	12	0	0	0	32	3	0	0	0	158

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	12	0	0	435	435	6	437	441	-
Stage 1	-	-	-	-	-	-	434	434	-	1	1	-
Stage 2	-	-	-	-	-	-	1	1	-	436	440	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.14	6.5	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.2	-	-	3.536	4	3.3	3.5	4	-
Pot Cap-1 Maneuver	1622	-	-	1620	-	-	528	517	1083	533	513	0
Stage 1	-	-	-	-	-	-	596	585	-	1027	899	0
Stage 2	-	-	-	-	-	-	1017	899	-	603	581	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1622	-	-	1620	-	-	474	448	1083	477	445	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	474	448	-	477	445	-
Stage 1	-	-	-	-	-	-	517	507	-	890	899	-
Stage 2	-	-	-	-	-	-	1017	899	-	520	504	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	7.2	0	13.2	0
HCM LOS			B	A

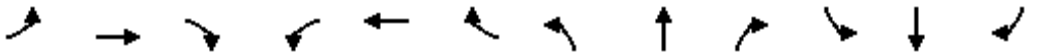
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	472	1622	-	-	1620	-	-	-	-
HCM Lane V/C Ratio	0.073	0.132	-	-	-	-	-	-	-
HCM Control Delay (s)	13.2	7.6	0	-	0	-	-	0	0
HCM Lane LOS	B	A	A	-	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	0.5	-	-	0	-	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	0	523	0	0	0	544	463	0	0	358	45
Future Volume (vph)	42	0	523	0	0	0	544	463	0	0	358	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.3	4.7				4.9	4.0			4.0	
Lane Util. Factor		1.00	1.00				*0.85	1.00			0.95	
Frpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Flpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	1.00			0.98	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1703	1495				2868	1881			3464	
Flt Permitted		0.76	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1357	1495				2868	1881			3464	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	49	0	608	0	0	0	633	538	0	0	416	52
RTOR Reduction (vph)	0	0	121	0	0	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	49	487	0	0	0	633	538	0	0	460	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	6%	0%	8%	0%	0%	0%	7%	1%	0%	0%	2%	5%
Turn Type	Perm	NA	pm+ov				Prot	NA		Prot	NA	
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Actuated Green, G (s)		6.7	34.4				27.7	78.4			45.3	
Effective Green, g (s)		6.9	35.8				28.2	79.8			46.7	
Actuated g/C Ratio		0.07	0.38				0.30	0.84			0.49	
Clearance Time (s)		4.5	5.4				5.4	5.4			5.4	
Vehicle Extension (s)		2.5	2.3				2.3	4.4			4.4	
Lane Grp Cap (vph)		98	563				851	1580			1702	
v/s Ratio Prot			c0.26				0.22	c0.29			0.13	
v/s Ratio Perm		0.04	0.07									
v/c Ratio		0.50	0.87				0.74	0.34			0.27	
Uniform Delay, d1		42.4	27.4				30.1	1.7			14.2	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		2.9	12.9				3.3	0.6			0.4	
Delay (s)		45.3	40.2				33.4	2.3			14.6	
Level of Service		D	D				C	A			B	
Approach Delay (s)		40.6			0.0			19.1			14.6	
Approach LOS		D			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	13.2
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	0	523	0	0	0	544	463	0	0	358	45
Future Volume (veh/h)	42	0	523	0	0	0	544	463	0	0	358	45
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		0.99
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	1811	1900	1781	1900	1900	1900	1796	1885	1900	1900	1870	1826
Adj Flow Rate, veh/h	49	0	492	0	0	0	633	538	0	0	416	46
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	6	0	8	0	0	0	7	1	0	0	2	5
Cap, veh/h	314	0	654	0	320	0	758	662	0	623	1403	154
Arrive On Green	0.16	0.00	0.17	0.00	0.00	0.00	0.26	0.35	0.00	0.00	0.44	0.42
Sat Flow, veh/h	1440	0	1510	0	1900	0	2908	1885	0	1810	3224	354
Grp Volume(v), veh/h	49	0	492	0	0	0	633	538	0	0	228	234
Grp Sat Flow(s),veh/h/ln	1440	0	1510	0	1900	0	1454	1885	0	1810	1777	1801
Q Serve(g_s), s	2.8	0.0	16.2	0.0	0.0	0.0	19.5	24.6	0.0	0.0	7.9	8.0
Cycle Q Clear(g_c), s	2.8	0.0	16.2	0.0	0.0	0.0	19.5	24.6	0.0	0.0	7.9	8.0
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.00	1.00		0.20
Lane Grp Cap(c), veh/h	311	0	654	0	320	0	758	662	0	623	773	784
V/C Ratio(X)	0.16	0.00	0.75	0.00	0.00	0.00	0.83	0.81	0.00	0.00	0.30	0.30
Avail Cap(c_a), veh/h	311	0	654	0	320	0	1105	1151	0	623	773	784
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	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	34.4	0.0	22.6	0.0	0.0	0.0	33.2	28.0	0.0	0.0	17.4	17.5
Incr Delay (d2), s/veh	0.2	0.0	4.7	0.0	0.0	0.0	3.0	10.5	0.0	0.0	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	9.3	0.0	0.0	0.0	7.0	12.5	0.0	0.0	3.2	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	0.0	27.3	0.0	0.0	0.0	36.2	38.4	0.0	0.0	18.4	18.5
LnGrp LOS	C	A	C	A	A	A	D	D	A	A	B	B
Approach Vol, veh/h		541			0			1171			462	
Approach Delay, s/veh		28.0			0.0			37.2			18.4	
Approach LOS		C						D			B	

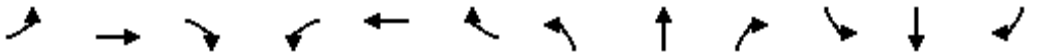
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	29.7	45.3		20.0	37.6	37.4		20.0				
Change Period (Y+Rc), s	* 5.4	* 5.4		4.5	* 5.4	* 5.4		4.5				
Max Green Setting (Gmax), s	* 36	* 29		15.5	* 8.5	* 57		15.5				
Max Q Clear Time (g_c+I1), s	21.5	10.0		0.0	0.0	26.6		18.2				
Green Ext Time (p_c), s	2.7	3.3		0.0	0.0	5.4		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		30.9	
HCM 6th LOS		C	

Notes

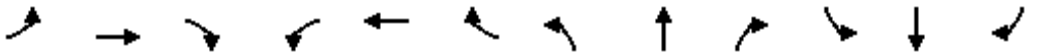
User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	3	165	1	1	12	183	670	3	5	717	258
Future Volume (vph)	191	3	165	1	1	12	183	670	3	5	717	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97			0.96		1.00	1.00		1.00	1.00	0.93
Flpb, ped/bikes	0.97	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85			0.88		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1584	1411			1445		1624	1643		1624	1710	1348
Flt Permitted	0.75	1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1246	1411			1431		1624	1643		1624	1710	1348
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	208	3	179	1	1	13	199	728	3	5	779	280
RTOR Reduction (vph)	0	142	0	0	10	0	0	0	0	0	0	66
Lane Group Flow (vph)	208	40	0	0	5	0	199	731	0	5	779	214
Confl. Peds. (#/hr)	12		4	4		12	4		19	19		19
Confl. Bikes (#/hr)			1						2			2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	19.5	19.5			19.5		11.4	60.0		1.1	49.7	49.7
Effective Green, g (s)	19.5	19.5			19.5		11.4	60.0		1.1	49.7	49.7
Actuated g/C Ratio	0.21	0.21			0.21		0.12	0.64		0.01	0.53	0.53
Clearance Time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.3	2.3			2.5		2.3	4.3		2.3	4.3	4.3
Lane Grp Cap (vph)	258	292			296		196	1047		18	903	711
v/s Ratio Prot		0.03					c0.12	0.44		0.00	c0.46	
v/s Ratio Perm	c0.17				0.00							0.16
v/c Ratio	0.81	0.14			0.02		1.02	0.70		0.28	0.86	0.30
Uniform Delay, d1	35.5	30.4			29.7		41.3	11.1		46.1	19.2	12.5
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	16.0	0.1			0.0		68.3	2.3		4.9	9.0	0.4
Delay (s)	51.5	30.6			29.7		109.7	13.4		51.0	28.2	12.8
Level of Service	D	C			C		F	B		D	C	B
Approach Delay (s)		41.7			29.7			34.0			24.3	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	94.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	82.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	3	165	1	1	12	183	670	3	5	717	258
Future Volume (veh/h)	191	3	165	1	1	12	183	670	3	5	717	258
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.95	0.98		0.97	1.00		0.96	1.00		0.96
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	1710	1710	1710	1710	1710	1710	1710	1657	1710	1710	1710	1710
Adj Flow Rate, veh/h	208	3	103	1	1	13	199	728	3	5	779	193
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, %	0	0	0	0	0	0	0	4	0	0	0	0
Cap, veh/h	329	8	262	49	32	241	208	1060	4	9	890	724
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.13	0.64	0.64	0.01	0.52	0.52
Sat Flow, veh/h	1242	39	1342	25	166	1238	1629	1648	7	1629	1710	1392
Grp Volume(v), veh/h	208	0	106	15	0	0	199	0	731	5	779	193
Grp Sat Flow(s),veh/h/ln	1242	0	1381	1429	0	0	1629	0	1655	1629	1710	1392
Q Serve(g_s), s	13.0	0.0	5.8	0.0	0.0	0.0	10.4	0.0	24.3	0.3	34.5	6.6
Cycle Q Clear(g_c), s	13.7	0.0	5.8	0.7	0.0	0.0	10.4	0.0	24.3	0.3	34.5	6.6
Prop In Lane	1.00		0.97	0.07		0.87	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	329	0	269	323	0	0	208	0	1064	9	890	724
V/C Ratio(X)	0.63	0.00	0.39	0.05	0.00	0.00	0.96	0.00	0.69	0.59	0.88	0.27
Avail Cap(c_a), veh/h	455	0	409	465	0	0	208	0	1064	208	1093	890
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.3	0.0	30.2	28.2	0.0	0.0	37.3	0.0	9.8	42.7	18.2	11.5
Incr Delay (d2), s/veh	1.2	0.0	0.6	0.0	0.0	0.0	49.4	0.0	2.2	33.5	7.8	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	4.2	0.0	1.9	0.3	0.0	0.0	6.9	0.0	7.8	0.2	13.9	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	0.0	30.8	28.2	0.0	0.0	86.7	0.0	12.0	76.2	25.9	11.8
LnGrp LOS	C	A	C	C	A	A	F	A	B	E	C	B
Approach Vol, veh/h		314			15			930			977	
Approach Delay, s/veh		33.3			28.2			28.0			23.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	60.3		21.3	15.0	49.8		21.3				
Change Period (Y+Rc), s	4.0	5.0		4.5	4.0	5.0		4.5				
Max Green Setting (Gmax), s	11.0	55.0		25.5	11.0	55.0		25.5				
Max Q Clear Time (g_c+I1), s	2.3	26.3		15.7	12.4	36.5		2.7				
Green Ext Time (p_c), s	0.0	7.9		1.0	0.0	8.2		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		26.7	
HCM 6th LOS		C	

Intersection	
Int Delay, s/veh	3.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	46	121	557	106	130	631
Future Vol, veh/h	46	121	557	106	130	631
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	65	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	0	0	0	0	0
Mvmt Flow	51	133	612	116	143	693

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1591	612	0	0	728	0
Stage 1	612	-	-	-	-	-
Stage 2	979	-	-	-	-	-
Critical Hdwy	6.42	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	118	497	-	-	885	-
Stage 1	541	-	-	-	-	-
Stage 2	364	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	99	497	-	-	885	-
Mov Cap-2 Maneuver	219	-	-	-	-	-
Stage 1	541	-	-	-	-	-
Stage 2	305	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.1	0	1.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	368	885	-
HCM Lane V/C Ratio	-	-	0.499	0.161	-
HCM Control Delay (s)	-	-	24.1	9.8	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	2.7	0.6	-

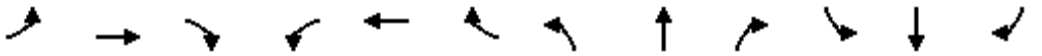
Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↕	↱
Traffic Vol, veh/h	123	0	25	0	0	0	22	3	0	0	4	152
Future Vol, veh/h	123	0	25	0	0	0	22	3	0	0	4	152
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	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	1	0	0	0	0	0	5	0	0	0	0	0
Mvmt Flow	135	0	27	0	0	0	24	3	0	0	4	167

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	27	0	0	287	285	14	286	298	-
Stage 1	-	-	-	-	-	-	284	284	-	1	1	-
Stage 2	-	-	-	-	-	-	3	1	-	285	297	-
Critical Hdwy	4.11	-	-	4.1	-	-	7.15	6.5	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.2	-	-	3.545	4	3.3	3.5	4	-
Pot Cap-1 Maneuver	1628	-	-	1600	-	-	659	628	1072	670	617	0
Stage 1	-	-	-	-	-	-	717	680	-	1027	899	0
Stage 2	-	-	-	-	-	-	1012	899	-	727	671	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1628	-	-	1600	-	-	613	575	1072	624	565	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	613	575	-	624	565	-
Stage 1	-	-	-	-	-	-	657	623	-	941	899	-
Stage 2	-	-	-	-	-	-	1007	899	-	662	615	-

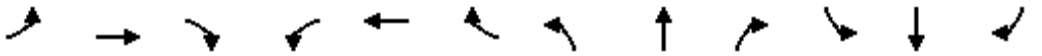
Approach	EB	WB	NB	SB
HCM Control Delay, s	6.2	0	11.2	11.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	608	1628	-	-	1600	-	-	565	-
HCM Lane V/C Ratio	0.045	0.083	-	-	-	-	-	0.008	-
HCM Control Delay (s)	11.2	7.4	0	-	0	-	-	11.4	0
HCM Lane LOS	B	A	A	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	0.3	-	-	0	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	0	589	0	0	0	583	646	0	0	629	39
Future Volume (vph)	41	0	589	0	0	0	583	646	0	0	629	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0				4.0	4.0			4.0	
Lane Util. Factor		1.00	1.00				*0.85	1.00			0.95	
Frpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Flpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	1.00			0.99	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1802	1583				2895	1900			3570	
Flt Permitted		0.76	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1436	1583				2895	1900			3570	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	45	0	647	0	0	0	641	710	0	0	691	43
RTOR Reduction (vph)	0	0	45	0	0	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	45	602	0	0	0	641	710	0	0	731	0
Confl. Peds. (#/hr)	1					1						
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	6%	0%	0%	0%	0%	4%
Turn Type	Perm	NA	pm+ov				Prot	NA		Prot	NA	
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Actuated Green, G (s)		6.5	44.3				37.8	88.6			45.4	
Effective Green, g (s)		7.0	47.1				39.2	90.0			46.8	
Actuated g/C Ratio		0.07	0.45				0.37	0.86			0.45	
Clearance Time (s)		4.5	5.4				5.4	5.4			5.4	
Vehicle Extension (s)		2.5	2.3				2.3	4.4			4.4	
Lane Grp Cap (vph)		95	710				1080	1628			1591	
v/s Ratio Prot			c0.32				0.22	c0.37			0.20	
v/s Ratio Perm		0.03	0.06									
v/c Ratio		0.47	0.85				0.59	0.44			0.46	
Uniform Delay, d1		47.2	25.8				26.5	1.7			20.3	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		2.7	9.1				0.7	0.9			1.0	
Delay (s)		49.9	34.8				27.2	2.6			21.2	
Level of Service		D	C				C	A			C	
Approach Delay (s)		35.8			0.0			14.2			21.2	
Approach LOS		D			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	0	589	0	0	0	583	646	0	0	629	39
Future Volume (veh/h)	41	0	589	0	0	0	583	646	0	0	629	39
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	1900	1900	1870	1900	1900	1900	1811	1900	1900	1900	1900	1841
Adj Flow Rate, veh/h	45	0	587	0	0	0	641	710	0	0	691	43
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	2	0	0	0	6	0	0	0	0	4
Cap, veh/h	274	0	662	0	271	0	781	838	0	513	1645	102
Arrive On Green	0.14	0.00	0.15	0.00	0.00	0.00	0.27	0.44	0.00	0.00	0.48	0.46
Sat Flow, veh/h	1435	0	1582	0	1900	0	2932	1900	0	1810	3452	215
Grp Volume(v), veh/h	45	0	587	0	0	0	641	710	0	0	361	373
Grp Sat Flow(s),veh/h/ln	1435	0	1582	0	1900	0	1466	1900	0	1810	1805	1861
Q Serve(g_s), s	2.9	0.0	15.9	0.0	0.0	0.0	21.5	35.0	0.0	0.0	13.7	13.8
Cycle Q Clear(g_c), s	2.9	0.0	15.9	0.0	0.0	0.0	21.5	35.0	0.0	0.0	13.7	13.8
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.00	1.00		0.12
Lane Grp Cap(c), veh/h	267	0	662	0	271	0	781	838	0	513	860	887
V/C Ratio(X)	0.17	0.00	0.89	0.00	0.00	0.00	0.82	0.85	0.00	0.00	0.42	0.42
Avail Cap(c_a), veh/h	267	0	662	0	271	0	1201	1249	0	513	860	887
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	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	40.0	0.0	28.3	0.0	0.0	0.0	36.2	26.2	0.0	0.0	18.0	18.1
Incr Delay (d2), s/veh	0.2	0.0	13.6	0.0	0.0	0.0	2.0	10.3	0.0	0.0	1.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	15.2	0.0	0.0	0.0	7.7	17.4	0.0	0.0	5.6	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.3	0.0	41.9	0.0	0.0	0.0	38.1	36.5	0.0	0.0	19.5	19.5
LnGrp LOS	D	A	D	A	A	A	D	D	A	A	B	B
Approach Vol, veh/h		632			0			1351			734	
Approach Delay, s/veh		41.8			0.0			37.3			19.5	
Approach LOS		D						D			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	32.0	54.0		19.0	35.7	50.3		19.0				
Change Period (Y+Rc), s	* 5.4	* 5.4		4.5	* 5.4	* 5.4		4.5				
Max Green Setting (Gmax), s	* 42	* 34		14.5	* 8.5	* 68		14.5				
Max Q Clear Time (g_c+I1), s	23.5	15.8		0.0	0.0	37.0		17.9				
Green Ext Time (p_c), s	3.0	5.5		0.0	0.0	7.9		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	33.5
HCM 6th LOS	C

Notes

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

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: SW Boones Ferry Road & SW Ibach Street/SW Ibach Court

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	TR	L	T	R
Maximum Queue (ft)	315	232	40	194	436	138	385	210
Average Queue (ft)	117	95	12	113	179	7	194	69
95th Queue (ft)	248	189	38	194	377	49	325	195
Link Distance (ft)	622	622	761		2493		697	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)				95		105		110
Storage Blk Time (%)				20	13		21	
Queuing Penalty (veh)				116	24		25	

Intersection: 2: SW Boones Ferry Road & SW Norwood Road

Movement	WB	NB	SB
Directions Served	LR	T	L
Maximum Queue (ft)	116	29	55
Average Queue (ft)	49	2	17
95th Queue (ft)	93	26	45
Link Distance (ft)	489	1810	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			290
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Intersection: 4: SW 82nd Avenue & SW Norwood Road/Driveway

Movement	NB
Directions Served	LTR
Maximum Queue (ft)	44
Average Queue (ft)	18
95th Queue (ft)	42
Link Distance (ft)	494
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: SW Boones Ferry Road & SW Day Road

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	L	TR	T	TR
Maximum Queue (ft)	94	238	297	476	201	170	175
Average Queue (ft)	34	114	169	236	53	66	72
95th Queue (ft)	78	204	297	402	143	130	143
Link Distance (ft)	727	727		930	930	1961	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			200				500
Storage Blk Time (%)			4	15		3	
Queuing Penalty (veh)			11	40		6	

Zone Summary

Zone wide Queuing Penalty: 222

Intersection: 1: SW Boones Ferry Road & SW Ibach Street/SW Ibach Court

Movement	EB	EB	WB	NB	NB	SB	SB	SB	B21
Directions Served	L	TR	LTR	L	TR	L	T	R	T
Maximum Queue (ft)	187	149	41	195	1001	168	604	210	50
Average Queue (ft)	102	67	9	135	393	9	294	127	4
95th Queue (ft)	178	124	34	228	1085	65	532	260	52
Link Distance (ft)	622	622	761		2493		697		2246
Upstream Blk Time (%)							1		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)				95		105		110	
Storage Blk Time (%)				40	14		28	0	
Queuing Penalty (veh)				268	25		74	1	

Intersection: 2: SW Boones Ferry Road & SW Norwood Road

Movement	WB	NB	SB
Directions Served	LR	R	L
Maximum Queue (ft)	170	13	80
Average Queue (ft)	63	1	38
95th Queue (ft)	134	7	74
Link Distance (ft)	489		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		65	290
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: SW 82nd Avenue & SW Norwood Road/Driveway

Movement	NB	SB
Directions Served	LTR	LT
Maximum Queue (ft)	51	29
Average Queue (ft)	17	3
95th Queue (ft)	43	16
Link Distance (ft)	494	648
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 6: SW Boones Ferry Road & SW Day Road

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	L	TR	T	TR
Maximum Queue (ft)	90	369	299	436	223	240	257
Average Queue (ft)	27	156	181	240	66	106	121
95th Queue (ft)	67	274	308	367	178	194	216
Link Distance (ft)	727	727		930	930	1961	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			200				500
Storage Blk Time (%)			4	17		8	
Queuing Penalty (veh)			10	49		30	

Zone Summary

Zone wide Queuing Penalty: 457

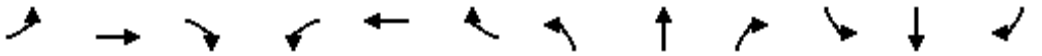
2026 Background Conditions
With Basalt Creek Parkway Extension

AM Peak Hour Synchro Reports

PM Peak Hour Synchro Reports

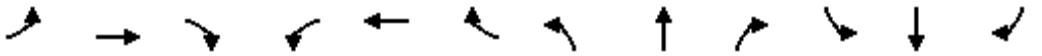
AM Peak Hour Queuing Reports

PM Peak Hour Queuing Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	1	286	2	1	16	169	642	5	6	613	82
Future Volume (vph)	175	1	286	2	1	16	169	642	5	6	613	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.92			0.94		1.00	1.00		1.00	1.00	0.91
Flpb, ped/bikes	0.96	1.00			1.00		1.00	1.00		0.97	1.00	1.00
Frt	1.00	0.85			0.88		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1692	1469			1573		1787	1842		1755	1827	1427
Flt Permitted	0.74	1.00			0.93		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1322	1469			1477		1787	1842		1755	1827	1427
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	216	1	353	2	1	20	209	793	6	7	757	101
RTOR Reduction (vph)	0	213	0	0	16	0	0	0	0	0	0	51
Lane Group Flow (vph)	216	141	0	0	7	0	209	799	0	7	757	50
Confl. Peds. (#/hr)	24		26	26		24	8		28	28		28
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	1%	3%	0%	0%	4%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	17.2	17.2			17.2		11.8	51.2		0.7	40.1	40.1
Effective Green, g (s)	17.7	17.7			17.7		11.8	52.2		0.7	41.1	41.1
Actuated g/C Ratio	0.21	0.21			0.21		0.14	0.63		0.01	0.50	0.50
Clearance Time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.3	2.3			2.5		2.3	4.3		2.3	4.3	4.3
Lane Grp Cap (vph)	283	314			316		255	1164		14	909	710
v/s Ratio Prot		0.10					c0.12	0.43		0.00	c0.41	
v/s Ratio Perm	c0.16				0.00							0.04
v/c Ratio	0.76	0.45			0.02		0.82	0.69		0.50	0.83	0.07
Uniform Delay, d1	30.5	28.2			25.6		34.4	9.9		40.8	17.8	10.8
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.8	0.6			0.0		17.7	1.9		15.4	7.1	0.1
Delay (s)	41.3	28.8			25.6		52.0	11.8		56.2	24.9	10.9
Level of Service	D	C			C		D	B		E	C	B
Approach Delay (s)		33.5			25.6			20.1			23.5	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	82.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	1	286	2	1	16	169	642	5	6	613	82
Future Volume (veh/h)	175	1	286	2	1	16	169	642	5	6	613	82
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.94		0.94	0.96		0.94	1.00		0.98	1.00		0.95
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	1870	1900	1885	1900	1900	1900	1885	1856	1900	1900	1841	1856
Adj Flow Rate, veh/h	216	1	180	2	1	14	209	793	6	7	757	52
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	2	0	1	0	0	0	1	3	0	0	4	3
Cap, veh/h	385	2	325	69	43	273	251	1130	9	13	887	718
Arrive On Green	0.22	0.22	0.21	0.21	0.22	0.21	0.14	0.61	0.60	0.01	0.48	0.48
Sat Flow, veh/h	1318	8	1504	69	201	1261	1795	1839	14	1810	1841	1490
Grp Volume(v), veh/h	216	0	181	17	0	0	209	0	799	7	757	52
Grp Sat Flow(s),veh/h/ln	1318	0	1512	1532	0	0	1795	0	1853	1810	1841	1490
Q Serve(g_s), s	10.5	0.0	7.9	0.0	0.0	0.0	8.4	0.0	21.6	0.3	26.8	1.4
Cycle Q Clear(g_c), s	11.2	0.0	7.9	0.6	0.0	0.0	8.4	0.0	21.6	0.3	26.8	1.4
Prop In Lane	1.00		0.99	0.12		0.82	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	385	0	327	375	0	0	251	0	1139	13	887	718
V/C Ratio(X)	0.56	0.00	0.55	0.05	0.00	0.00	0.83	0.00	0.70	0.53	0.85	0.07
Avail Cap(c_a), veh/h	510	0	470	515	0	0	291	0	1276	98	1069	866
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.1	0.0	26.1	23.2	0.0	0.0	31.0	0.0	9.7	36.6	16.9	10.3
Incr Delay (d2), s/veh	0.8	0.0	0.9	0.0	0.0	0.0	15.0	0.0	1.9	19.0	6.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	2.8	0.2	0.0	0.0	4.5	0.0	7.4	0.2	11.3	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.8	0.0	27.0	23.2	0.0	0.0	46.0	0.0	11.5	55.7	23.5	10.4
LnGrp LOS	C	A	C	C	A	A	D	A	B	E	C	B
Approach Vol, veh/h		397			17			1008			816	
Approach Delay, s/veh		27.4			23.2			18.7			22.9	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	49.5		20.0	14.4	39.7		20.0				
Change Period (Y+Rc), s	4.0	5.0		4.5	4.0	5.0		4.5				
Max Green Setting (Gmax), s	4.0	50.0		22.5	12.0	42.0		22.5				
Max Q Clear Time (g_c+I1), s	2.3	23.6		13.2	10.4	28.8		2.6				
Green Ext Time (p_c), s	0.0	8.7		1.2	0.1	5.9		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		21.8	
HCM 6th LOS		C	

Intersection	
Int Delay, s/veh	5.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	74	128	503	37	61	393
Future Vol, veh/h	74	128	503	37	61	393
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	65	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	3	3	1	8	4	1
Mvmt Flow	91	158	621	46	75	485

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1256	623	0	0	667	0
Stage 1	621	-	-	-	-	-
Stage 2	635	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.14	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.236	-
Pot Cap-1 Maneuver	188	484	-	-	913	-
Stage 1	534	-	-	-	-	-
Stage 2	526	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	173	483	-	-	913	-
Mov Cap-2 Maneuver	310	-	-	-	-	-
Stage 1	534	-	-	-	-	-
Stage 2	483	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	27.6	0	1.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	401	913	-
HCM Lane V/C Ratio	-	-	0.622	0.082	-
HCM Control Delay (s)	-	-	27.6	9.3	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	4.1	0.3	-

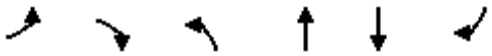
Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↕	↱
Traffic Vol, veh/h	167	0	9	0	0	0	25	2	0	0	0	124
Future Vol, veh/h	167	0	9	0	0	0	25	2	0	0	0	124
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	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	0	0	0	0	0	4	0	0	0	0	0
Mvmt Flow	214	0	12	0	0	0	32	3	0	0	0	159

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	12	0	0	435	435	6	437	441	-
Stage 1	-	-	-	-	-	-	434	434	-	1	1	-
Stage 2	-	-	-	-	-	-	1	1	-	436	440	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.14	6.5	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.2	-	-	3.536	4	3.3	3.5	4	-
Pot Cap-1 Maneuver	1622	-	-	1620	-	-	528	517	1083	533	513	0
Stage 1	-	-	-	-	-	-	596	585	-	1027	899	0
Stage 2	-	-	-	-	-	-	1017	899	-	603	581	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1622	-	-	1620	-	-	474	448	1083	477	445	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	474	448	-	477	445	-
Stage 1	-	-	-	-	-	-	517	507	-	890	899	-
Stage 2	-	-	-	-	-	-	1017	899	-	520	504	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	7.2	0	13.2	0
HCM LOS			B	A

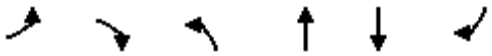
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	472	1622	-	-	1620	-	-	-	-
HCM Lane V/C Ratio	0.073	0.132	-	-	-	-	-	-	-
HCM Control Delay (s)	13.2	7.6	0	-	0	-	-	0	0
HCM Lane LOS	B	A	A	-	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	0.5	-	-	0	-	-	-	-



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	38	524	454	547	410	104
Future Volume (vph)	38	524	454	547	410	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1805	1615	1687	1881	1797	
Flt Permitted	0.95	1.00	0.28	1.00	1.00	
Satd. Flow (perm)	1805	1615	501	1881	1797	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	44	609	528	636	477	121
RTOR Reduction (vph)	0	145	0	0	8	0
Lane Group Flow (vph)	44	464	528	636	590	0
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	0%	0%	7%	1%	2%	5%
Turn Type	Prot	pt+ov	pm+pt	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases			6			
Actuated Green, G (s)	8.8	37.5	76.3	76.3	47.6	
Effective Green, g (s)	9.3	33.1	77.7	77.7	49.0	
Actuated g/C Ratio	0.10	0.35	0.82	0.82	0.52	
Clearance Time (s)	4.5		5.4	5.4	5.4	
Vehicle Extension (s)	2.5		2.3	4.4	4.4	
Lane Grp Cap (vph)	176	562	718	1538	926	
v/s Ratio Prot	0.02	c0.29	0.19	0.34	0.33	
v/s Ratio Perm			c0.41			
v/c Ratio	0.25	0.83	0.74	0.41	0.64	
Uniform Delay, d1	39.6	28.3	14.5	2.4	16.6	
Progression Factor	1.00	1.00	1.03	1.35	1.00	
Incremental Delay, d2	0.5	9.5	2.8	0.6	3.3	
Delay (s)	40.2	37.8	17.7	3.9	19.9	
Level of Service	D	D	B	A	B	
Approach Delay (s)	37.9			10.1	19.9	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	38	524	454	547	410	104
Future Volume (veh/h)	38	524	454	547	410	104
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1796	1885	1870	1826
Adj Flow Rate, veh/h	44	493	528	636	477	109
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	7	1	2	5
Cap, veh/h	124	803	847	1597	536	122
Arrive On Green	0.07	0.07	0.44	0.85	0.37	0.35
Sat Flow, veh/h	1810	1610	1711	1885	1466	335
Grp Volume(v), veh/h	44	493	528	636	0	586
Grp Sat Flow(s),veh/h/ln	1810	1610	1711	1885	0	1802
Q Serve(g_s), s	2.2	0.0	16.2	7.4	0.0	29.1
Cycle Q Clear(g_c), s	2.2	0.0	16.2	7.4	0.0	29.1
Prop In Lane	1.00	1.00	1.00			0.19
Lane Grp Cap(c), veh/h	124	803	847	1597	0	658
V/C Ratio(X)	0.36	0.61	0.62	0.40	0.00	0.89
Avail Cap(c_a), veh/h	318	976	847	1597	0	705
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.2	17.2	17.9	1.7	0.0	28.5
Incr Delay (d2), s/veh	1.3	0.6	1.2	0.7	0.0	16.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	7.5	8.3	1.4	0.0	15.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	43.5	17.8	19.2	2.4	0.0	45.1
LnGrp LOS	D	B	B	A	A	D
Approach Vol, veh/h	537			1164	586	
Approach Delay, s/veh	19.9			10.0	45.1	
Approach LOS	B			B	D	

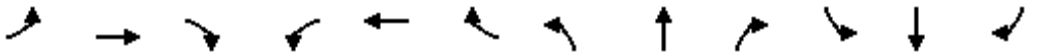
Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	45.8	38.7				84.5	10.5
Change Period (Y+Rc), s	* 5.4	* 5.4				* 5.4	4.5
Max Green Setting (Gmax), s	* 28	* 36				* 69	16.2
Max Q Clear Time (g_c+I1), s	18.2	31.1				9.4	4.2
Green Ext Time (p_c), s	0.9	2.2				9.2	1.2

Intersection Summary	
HCM 6th Ctrl Delay	21.3
HCM 6th LOS	C

Notes

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

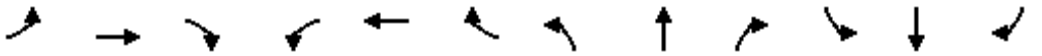
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	0	261	0	0	0	272	968	0	0	908	15
Future Volume (vph)	17	0	261	0	0	0	272	968	0	0	908	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.3	4.7				4.9	4.0			4.0	
Lane Util. Factor		1.00	1.00				0.97	1.00			0.95	
Frpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Flpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	1.00			1.00	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1703	1495				3273	1881			3528	
Flt Permitted		0.87	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1559	1495				3273	1881			3528	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	20	0	303	0	0	0	316	1126	0	0	1056	17
RTOR Reduction (vph)	0	0	81	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	20	222	0	0	0	316	1126	0	0	1072	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	6%	0%	8%	0%	0%	0%	7%	1%	0%	0%	2%	5%
Turn Type	Perm	NA	pm+ov				Prot	NA		Prot	NA	
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Actuated Green, G (s)		4.4	19.6				15.2	80.7			60.1	
Effective Green, g (s)		4.6	21.0				15.7	82.1			61.5	
Actuated g/C Ratio		0.05	0.22				0.17	0.86			0.65	
Clearance Time (s)		4.5	5.4				5.4	5.4			5.4	
Vehicle Extension (s)		2.5	2.3				2.3	4.4			4.4	
Lane Grp Cap (vph)		75	330				540	1625			2283	
v/s Ratio Prot			c0.11				0.10	c0.60			0.30	
v/s Ratio Perm		0.01	0.04									
v/c Ratio		0.27	0.67				0.59	0.69			0.47	
Uniform Delay, d1		43.6	33.9				36.6	2.2			8.5	
Progression Factor		1.00	1.00				1.00	1.00			0.92	
Incremental Delay, d2		1.4	4.6				1.2	2.5			0.5	
Delay (s)		45.0	38.4				37.9	4.6			8.3	
Level of Service		D	D				D	A			A	
Approach Delay (s)		38.8			0.0			11.9			8.3	
Approach LOS		D			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	13.2
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	0	261	0	0	0	272	968	0	0	908	15
Future Volume (veh/h)	17	0	261	0	0	0	272	968	0	0	908	15
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		0.99
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	1811	1900	1781	1900	1900	1900	1796	1885	1900	1900	1870	1826
Adj Flow Rate, veh/h	20	0	280	0	0	0	316	1126	0	0	1056	11
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	6	0	8	0	0	0	7	1	0	0	2	5
Cap, veh/h	170	0	302	0	130	0	423	1261	0	229	2408	25
Arrive On Green	0.06	0.00	0.07	0.00	0.00	0.00	0.13	0.67	0.00	0.00	0.67	0.65
Sat Flow, veh/h	1440	0	1510	0	1900	0	3319	1885	0	1810	3602	38
Grp Volume(v), veh/h	20	0	280	0	0	0	316	1126	0	0	521	546
Grp Sat Flow(s),veh/h/ln	1440	0	1510	0	1900	0	1659	1885	0	1810	1777	1863
Q Serve(g_s), s	1.3	0.0	6.7	0.0	0.0	0.0	8.7	46.6	0.0	0.0	13.1	13.1
Cycle Q Clear(g_c), s	1.3	0.0	6.7	0.0	0.0	0.0	8.7	46.6	0.0	0.0	13.1	13.1
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.00	1.00		0.02
Lane Grp Cap(c), veh/h	167	0	302	0	130	0	423	1261	0	229	1188	1245
V/C Ratio(X)	0.12	0.00	0.93	0.00	0.00	0.00	0.75	0.89	0.00	0.00	0.44	0.44
Avail Cap(c_a), veh/h	167	0	302	0	130	0	667	1429	0	229	1188	1245
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	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	42.2	0.0	37.3	0.0	0.0	0.0	40.0	12.9	0.0	0.0	7.4	7.4
Incr Delay (d2), s/veh	0.2	0.0	33.2	0.0	0.0	0.0	1.6	9.9	0.0	0.0	1.2	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	8.9	0.0	0.0	0.0	3.6	19.2	0.0	0.0	4.2	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.4	0.0	70.5	0.0	0.0	0.0	41.6	22.8	0.0	0.0	8.6	8.5
LnGrp LOS	D	A	E	A	A	A	D	C	A	A	A	A
Approach Vol, veh/h		300			0			1442			1067	
Approach Delay, s/veh		68.6			0.0			26.9			8.5	
Approach LOS		E						C			A	

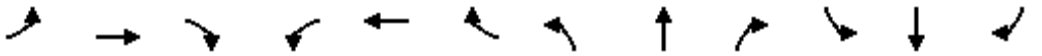
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.0	67.5		10.5	16.9	67.6		10.5				
Change Period (Y+Rc), s	* 5.4	* 5.4		4.5	* 5.4	* 5.4		4.5				
Max Green Setting (Gmax), s	* 19	* 55		6.0	* 4	* 71		6.0				
Max Q Clear Time (g_c+I1), s	10.7	15.1		0.0	0.0	48.6		8.7				
Green Ext Time (p_c), s	0.9	11.9		0.0	0.0	13.6		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		24.4	
HCM 6th LOS		C	

Notes

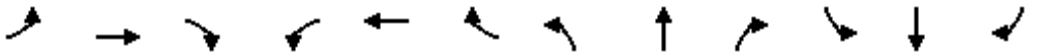
User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	3	161	1	1	12	180	637	3	5	798	193
Future Volume (vph)	144	3	161	1	1	12	180	637	3	5	798	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97			0.96		1.00	1.00		1.00	1.00	0.93
Flpb, ped/bikes	0.98	1.00			1.00		1.00	1.00		0.98	1.00	1.00
Frt	1.00	0.85			0.88		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1761	1568			1607		1805	1825		1762	1900	1500
Flt Permitted	0.75	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1386	1568			1587		1805	1825		1762	1900	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	157	3	175	1	1	13	196	692	3	5	867	210
RTOR Reduction (vph)	0	146	0	0	11	0	0	0	0	0	0	48
Lane Group Flow (vph)	157	32	0	0	4	0	196	695	0	5	867	162
Confl. Peds. (#/hr)	12		4	4		12	4		19	19		19
Confl. Bikes (#/hr)			1						2			2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	15.1	15.1			15.1		12.8	61.4		0.6	49.2	49.2
Effective Green, g (s)	15.1	15.1			15.1		12.8	61.4		0.6	49.2	49.2
Actuated g/C Ratio	0.17	0.17			0.17		0.14	0.68		0.01	0.54	0.54
Clearance Time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.3	2.3			2.5		2.3	4.3		2.3	4.3	4.3
Lane Grp Cap (vph)	231	261			264		255	1236		11	1031	814
v/s Ratio Prot		0.02					c0.11	0.38		0.00	c0.46	
v/s Ratio Perm	c0.11				0.00							0.11
v/c Ratio	0.68	0.12			0.02		0.77	0.56		0.45	0.84	0.20
Uniform Delay, d1	35.5	32.1			31.5		37.5	7.6		44.8	17.4	10.6
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.7	0.1			0.0		12.2	0.8		16.4	6.7	0.2
Delay (s)	42.1	32.2			31.6		49.7	8.4		61.2	24.1	10.8
Level of Service	D	C			C		D	A		E	C	B
Approach Delay (s)		36.9			31.6			17.5			21.7	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	3	161	1	1	12	180	637	3	5	798	193
Future Volume (veh/h)	144	3	161	1	1	12	180	637	3	5	798	193
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.94	0.97		0.96	1.00		0.97	1.00		0.96
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	1900	1900	1900	1900	1900	1900	1841	1900	1900	1900	1900
Adj Flow Rate, veh/h	157	3	88	1	1	13	196	692	3	5	867	123
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, %	0	0	0	0	0	0	0	4	0	0	0	0
Cap, veh/h	307	8	230	52	29	214	237	1226	5	10	1034	842
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.13	0.67	0.67	0.01	0.54	0.54
Sat Flow, veh/h	1370	50	1474	24	186	1368	1810	1831	8	1810	1900	1548
Grp Volume(v), veh/h	157	0	91	15	0	0	196	0	695	5	867	123
Grp Sat Flow(s),veh/h/ln	1370	0	1524	1578	0	0	1810	0	1839	1810	1900	1548
Q Serve(g_s), s	7.9	0.0	4.3	0.0	0.0	0.0	8.5	0.0	16.1	0.2	30.6	3.2
Cycle Q Clear(g_c), s	8.5	0.0	4.3	0.6	0.0	0.0	8.5	0.0	16.1	0.2	30.6	3.2
Prop In Lane	1.00		0.97	0.07		0.87	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	307	0	238	295	0	0	237	0	1232	10	1034	842
V/C Ratio(X)	0.51	0.00	0.38	0.05	0.00	0.00	0.83	0.00	0.56	0.53	0.84	0.15
Avail Cap(c_a), veh/h	409	0	352	410	0	0	294	0	1585	90	1424	1160
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.0	0.0	30.3	28.8	0.0	0.0	33.9	0.0	7.0	39.7	15.3	9.0
Incr Delay (d2), s/veh	0.8	0.0	0.6	0.1	0.0	0.0	13.1	0.0	0.6	24.8	4.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	1.6	0.2	0.0	0.0	4.4	0.0	5.0	0.2	12.4	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.8	0.0	30.9	28.8	0.0	0.0	47.0	0.0	7.7	64.5	19.5	9.2
LnGrp LOS	C	A	C	C	A	A	D	A	A	E	B	A
Approach Vol, veh/h		248			15			891			995	
Approach Delay, s/veh		32.1			28.8			16.3			18.4	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.4	58.6		17.0	14.5	48.6		17.0				
Change Period (Y+Rc), s	4.0	5.0		4.5	4.0	5.0		4.5				
Max Green Setting (Gmax), s	4.0	69.0		18.5	13.0	60.0		18.5				
Max Q Clear Time (g_c+I1), s	2.2	18.1		10.5	10.5	32.6		2.6				
Green Ext Time (p_c), s	0.0	8.3		0.6	0.2	10.9		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	19.2
HCM 6th LOS	B

Notes

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

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	49	115	523	111	121	714
Future Vol, veh/h	49	115	523	111	121	714
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	65	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	0	0	0	0	0
Mvmt Flow	54	126	575	122	133	785

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1626	575	0	0	697	0
Stage 1	575	-	-	-	-	-
Stage 2	1051	-	-	-	-	-
Critical Hdwy	6.42	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	112	521	-	-	909	-
Stage 1	563	-	-	-	-	-
Stage 2	336	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	96	521	-	-	909	-
Mov Cap-2 Maneuver	211	-	-	-	-	-
Stage 1	563	-	-	-	-	-
Stage 2	287	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.4	0	1.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	362	909	-
HCM Lane V/C Ratio	-	-	0.498	0.146	-
HCM Control Delay (s)	-	-	24.4	9.6	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	2.7	0.5	-

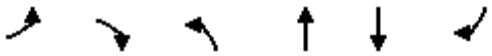
Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	↱
Traffic Vol, veh/h	123	0	25	0	0	0	22	3	0	0	4	151
Future Vol, veh/h	123	0	25	0	0	0	22	3	0	0	4	151
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	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	1	0	0	0	0	0	5	0	0	0	0	0
Mvmt Flow	135	0	27	0	0	0	24	3	0	0	4	166

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	27	0	0	287	285	14	286	298	-
Stage 1	-	-	-	-	-	-	284	284	-	1	1	-
Stage 2	-	-	-	-	-	-	3	1	-	285	297	-
Critical Hdwy	4.11	-	-	4.1	-	-	7.15	6.5	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.2	-	-	3.545	4	3.3	3.5	4	-
Pot Cap-1 Maneuver	1628	-	-	1600	-	-	659	628	1072	670	617	0
Stage 1	-	-	-	-	-	-	717	680	-	1027	899	0
Stage 2	-	-	-	-	-	-	1012	899	-	727	671	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1628	-	-	1600	-	-	613	575	1072	624	565	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	613	575	-	624	565	-
Stage 1	-	-	-	-	-	-	657	623	-	941	899	-
Stage 2	-	-	-	-	-	-	1007	899	-	662	615	-

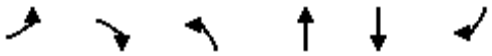
Approach	EB	WB	NB	SB
HCM Control Delay, s	6.2	0	11.2	11.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	608	1628	-	-	1600	-	-	565	-
HCM Lane V/C Ratio	0.045	0.083	-	-	-	-	-	0.008	-
HCM Control Delay (s)	11.2	7.4	0	-	0	-	-	11.4	0
HCM Lane LOS	B	A	A	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	0.3	-	-	0	-	-	0	-



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	69	486	454	614	634	130
Future Volume (vph)	69	486	454	614	634	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1805	1615	1703	1900	1844	
Flt Permitted	0.95	1.00	0.12	1.00	1.00	
Satd. Flow (perm)	1805	1615	213	1900	1844	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	76	534	499	675	697	143
RTOR Reduction (vph)	0	107	0	0	7	0
Lane Group Flow (vph)	76	427	499	675	833	0
Heavy Vehicles (%)	0%	0%	6%	0%	0%	4%
Turn Type	Prot	pt+ov	pm+pt	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases			6			
Actuated Green, G (s)	9.5	41.0	85.6	85.6	54.1	
Effective Green, g (s)	10.0	36.6	87.0	87.0	55.5	
Actuated g/C Ratio	0.10	0.35	0.83	0.83	0.53	
Clearance Time (s)	4.5		5.4	5.4	5.4	
Vehicle Extension (s)	2.5		2.3	4.4	4.4	
Lane Grp Cap (vph)	171	562	566	1574	974	
v/s Ratio Prot	0.04	c0.26	c0.23	0.36	0.45	
v/s Ratio Perm			c0.50			
v/c Ratio	0.44	0.76	0.88	0.43	0.86	
Uniform Delay, d1	44.9	30.3	26.6	2.4	21.3	
Progression Factor	1.00	1.00	1.02	1.31	1.00	
Incremental Delay, d2	1.3	5.6	11.8	0.7	9.6	
Delay (s)	46.2	35.9	39.0	3.8	30.9	
Level of Service	D	D	D	A	C	
Approach Delay (s)	37.1			18.7	30.9	
Approach LOS	D			B	C	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	69	486	454	614	634	130
Future Volume (veh/h)	69	486	454	614	634	130
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1811	1900	1900	1841
Adj Flow Rate, veh/h	76	435	499	675	697	138
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	6	0	0	4
Cap, veh/h	132	641	654	1617	738	146
Arrive On Green	0.07	0.07	0.33	0.85	0.48	0.47
Sat Flow, veh/h	1810	1610	1725	1900	1540	305
Grp Volume(v), veh/h	76	435	499	675	0	835
Grp Sat Flow(s),veh/h/ln	1810	1610	1725	1900	0	1845
Q Serve(g_s), s	4.3	0.0	21.7	8.6	0.0	45.2
Cycle Q Clear(g_c), s	4.3	0.0	21.7	8.6	0.0	45.2
Prop In Lane	1.00	1.00	1.00			0.17
Lane Grp Cap(c), veh/h	132	641	654	1617	0	884
V/C Ratio(X)	0.58	0.68	0.76	0.42	0.00	0.94
Avail Cap(c_a), veh/h	241	738	654	1617	0	896
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.1	26.1	28.8	1.8	0.0	26.1
Incr Delay (d2), s/veh	2.9	1.8	5.0	0.8	0.0	19.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	9.1	11.6	1.9	0.0	23.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	50.0	27.9	33.8	2.6	0.0	45.7
LnGrp LOS	D	C	C	A	A	D
Approach Vol, veh/h	511			1174	835	
Approach Delay, s/veh	31.2			15.9	45.7	
Approach LOS	C			B	D	

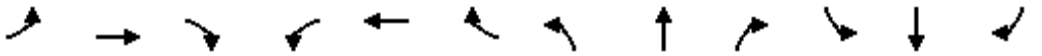
Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	39.0	54.3				93.3	11.7
Change Period (Y+Rc), s	* 5.4	* 5.4				* 5.4	4.5
Max Green Setting (Gmax), s	* 27	* 50				* 82	13.5
Max Q Clear Time (g_c+I1), s	23.7	47.2				10.6	6.3
Green Ext Time (p_c), s	0.4	1.7				10.2	0.9

Intersection Summary	
HCM 6th Ctrl Delay	28.8
HCM 6th LOS	C

Notes

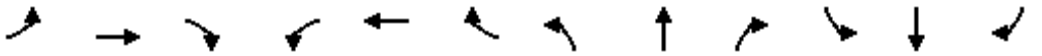
User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	0	294	0	0	0	292	1046	0	0	1094	14
Future Volume (vph)	14	0	294	0	0	0	292	1046	0	0	1094	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0				4.0	4.0			4.0	
Lane Util. Factor		1.00	1.00				0.97	1.00			0.95	
Frpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Flpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	1.00			1.00	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1802	1583				3303	1900			3602	
Flt Permitted		0.83	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1581	1583				3303	1900			3602	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	15	0	323	0	0	0	321	1149	0	0	1202	15
RTOR Reduction (vph)	0	0	62	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	15	261	0	0	0	321	1149	0	0	1216	0
Confl. Peds. (#/hr)	1					1						
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	6%	0%	0%	0%	0%	4%
Turn Type	Perm	NA	pm+ov				Prot	NA		Prot	NA	
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Actuated Green, G (s)		4.3	21.8				17.5	90.8			67.9	
Effective Green, g (s)		4.8	24.6				18.9	92.2			69.3	
Actuated g/C Ratio		0.05	0.23				0.18	0.88			0.66	
Clearance Time (s)		4.5	5.4				5.4	5.4			5.4	
Vehicle Extension (s)		2.5	2.3				2.3	4.4			4.4	
Lane Grp Cap (vph)		72	370				594	1668			2377	
v/s Ratio Prot			c0.13				0.10	c0.60			0.34	
v/s Ratio Perm		0.01	0.04									
v/c Ratio		0.21	0.71				0.54	0.69			0.51	
Uniform Delay, d1		48.3	36.9				39.1	2.0			9.2	
Progression Factor		1.00	1.00				1.00	1.00			0.85	
Incremental Delay, d2		1.0	5.3				0.7	2.3			0.5	
Delay (s)		49.3	42.2				39.8	4.3			8.2	
Level of Service		D	D				D	A			A	
Approach Delay (s)		42.5			0.0			12.1			8.2	
Approach LOS		D			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	0	294	0	0	0	292	1046	0	0	1094	14
Future Volume (veh/h)	14	0	294	0	0	0	292	1046	0	0	1094	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		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	1900	1900	1870	1900	1900	1900	1811	1900	1900	1900	1900	1841
Adj Flow Rate, veh/h	15	0	301	0	0	0	321	1149	0	0	1202	15
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	2	0	0	0	6	0	0	0	0	4
Cap, veh/h	157	0	323	0	118	0	447	1287	0	232	2520	31
Arrive On Green	0.06	0.00	0.07	0.00	0.00	0.00	0.13	0.68	0.00	0.00	0.69	0.68
Sat Flow, veh/h	1427	0	1578	0	1900	0	3346	1900	0	1810	3651	46
Grp Volume(v), veh/h	15	0	301	0	0	0	321	1149	0	0	594	623
Grp Sat Flow(s),veh/h/ln	1427	0	1578	0	1900	0	1673	1900	0	1810	1805	1892
Q Serve(g_s), s	1.1	0.0	7.4	0.0	0.0	0.0	9.7	51.8	0.0	0.0	16.0	16.0
Cycle Q Clear(g_c), s	1.1	0.0	7.4	0.0	0.0	0.0	9.7	51.8	0.0	0.0	16.0	16.0
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.00	1.00		0.02
Lane Grp Cap(c), veh/h	150	0	323	0	118	0	447	1287	0	232	1246	1306
V/C Ratio(X)	0.10	0.00	0.93	0.00	0.00	0.00	0.72	0.89	0.00	0.00	0.48	0.48
Avail Cap(c_a), veh/h	150	0	323	0	118	0	707	1484	0	232	1246	1306
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	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	46.9	0.0	41.1	0.0	0.0	0.0	43.6	13.8	0.0	0.0	7.5	7.5
Incr Delay (d2), s/veh	0.2	0.0	32.6	0.0	0.0	0.0	1.3	9.7	0.0	0.0	1.3	1.3
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	0.4	0.0	10.3	0.0	0.0	0.0	4.0	21.8	0.0	0.0	5.3	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.1	0.0	73.7	0.0	0.0	0.0	44.9	23.5	0.0	0.0	8.8	8.8
LnGrp LOS	D	A	E	A	A	A	D	C	A	A	A	A
Approach Vol, veh/h		316			0			1470			1217	
Approach Delay, s/veh		72.4			0.0			28.2			8.8	
Approach LOS		E						C			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.0	76.5		10.5	19.4	75.1		10.5				
Change Period (Y+Rc), s	* 5.4	* 5.4		4.5	* 5.4	* 5.4		4.5				
Max Green Setting (Gmax), s	* 21	* 63		6.0	* 4	* 81		6.0				
Max Q Clear Time (g_c+I1), s	11.7	18.0		0.0	0.0	53.8		9.4				
Green Ext Time (p_c), s	1.0	15.0		0.0	0.0	15.9		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	25.0
HCM 6th LOS	C

Notes

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

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: SW Boones Ferry Road & SW Ibach Street/SW Ibach Court

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	TR	L	T	R
Maximum Queue (ft)	166	272	48	194	488	64	542	210
Average Queue (ft)	82	105	14	115	189	5	257	76
95th Queue (ft)	145	200	41	205	372	36	457	215
Link Distance (ft)	622	622	761		2493		697	
Upstream Blk Time (%)							0	
Queuing Penalty (veh)							0	
Storage Bay Dist (ft)				95		105		110
Storage Blk Time (%)				18	14		30	
Queuing Penalty (veh)				122	24		27	

Intersection: 2: SW Boones Ferry Road & SW Norwood Road

Movement	WB	NB	NB	SB
Directions Served	LR	T	R	L
Maximum Queue (ft)	128	4	4	57
Average Queue (ft)	55	0	0	17
95th Queue (ft)	99	3	3	47
Link Distance (ft)	489	1810		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			65	290
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: SW 82nd Avenue & SW Norwood Road/Driveway

Movement	NB
Directions Served	LTR
Maximum Queue (ft)	44
Average Queue (ft)	18
95th Queue (ft)	41
Link Distance (ft)	494
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: SW Boones Ferry Road & Basalt Creek Parkway Extension

Movement	EB	EB	NB	NB	SB
Directions Served	L	R	L	T	TR
Maximum Queue (ft)	93	556	467	310	459
Average Queue (ft)	32	271	191	90	222
95th Queue (ft)	74	462	378	240	398
Link Distance (ft)	1043	1043		899	914
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			575		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: SW Boones Ferry Road & SW Day Road

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	L	TR	T	TR
Maximum Queue (ft)	58	144	225	291	483	274	297
Average Queue (ft)	10	65	78	146	118	106	122
95th Queue (ft)	35	118	188	251	372	219	242
Link Distance (ft)	720	720			930	1011	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			200	200			500
Storage Blk Time (%)			0	2	3	7	
Queuing Penalty (veh)			1	20	9	33	

Zone Summary

Zone wide Queuing Penalty: 236

Intersection: 1: SW Boones Ferry Road & SW Ibach Street/SW Ibach Court

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	TR	L	T	R
Maximum Queue (ft)	155	130	34	194	386	72	570	210
Average Queue (ft)	77	63	10	119	160	7	289	124
95th Queue (ft)	134	116	33	201	302	40	485	264
Link Distance (ft)	622	622	761		2493		697	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)				95		105		110
Storage Blk Time (%)				23	11		28	0
Queuing Penalty (veh)				152	20		55	0

Intersection: 2: SW Boones Ferry Road & SW Norwood Road

Movement	WB	NB	SB
Directions Served	LR	R	L
Maximum Queue (ft)	165	22	90
Average Queue (ft)	55	2	34
95th Queue (ft)	120	11	72
Link Distance (ft)	489		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		65	290
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: SW 82nd Avenue & SW Norwood Road/Driveway

Movement	NB	SB
Directions Served	LTR	LT
Maximum Queue (ft)	47	25
Average Queue (ft)	14	4
95th Queue (ft)	38	19
Link Distance (ft)	494	648
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 5: SW Boones Ferry Road & Basalt Creek Parkway Extension

Movement	EB	EB	NB	NB	SB	B8
Directions Served	L	R	L	T	TR	T
Maximum Queue (ft)	152	583	577	565	847	15
Average Queue (ft)	61	256	278	111	369	0
95th Queue (ft)	128	446	489	331	679	3
Link Distance (ft)	1043	1043		898	914	1810
Upstream Blk Time (%)					1	
Queuing Penalty (veh)					5	
Storage Bay Dist (ft)			575			
Storage Blk Time (%)			1	0		
Queuing Penalty (veh)			3	2		

Intersection: 6: SW Boones Ferry Road & SW Day Road

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	L	TR	T	TR
Maximum Queue (ft)	53	178	219	298	643	289	310
Average Queue (ft)	10	79	102	161	163	116	141
95th Queue (ft)	34	149	209	274	491	221	252
Link Distance (ft)	723	723			930	1019	
Upstream Blk Time (%)					0		
Queuing Penalty (veh)					0		
Storage Bay Dist (ft)			200	200			500
Storage Blk Time (%)			0	2	5	8	
Queuing Penalty (veh)			1	23	15	43	

Zone Summary

Zone wide Queuing Penalty: 319

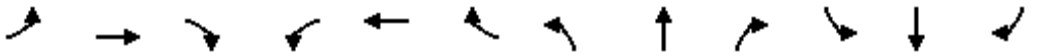
2026 Buildout Conditions
No Basalt Creek Parkway Extension

AM Peak Hour Synchro Reports

PM Peak Hour Synchro Reports

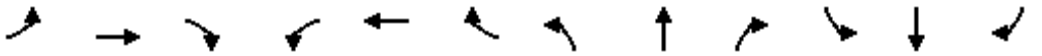
AM Peak Hour Queuing Reports

PM Peak Hour Queuing Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	233	1	288	2	1	16	177	592	5	6	524	110
Future Volume (vph)	233	1	288	2	1	16	177	592	5	6	524	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.91			0.94		1.00	1.00		1.00	1.00	0.91
Flpb, ped/bikes	0.95	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85			0.88		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1688	1464			1569		1787	1841		1805	1827	1420
Flt Permitted	0.74	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1319	1464			1537		1787	1841		1805	1827	1420
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	288	1	356	2	1	20	219	731	6	7	647	136
RTOR Reduction (vph)	0	252	0	0	15	0	0	0	0	0	0	44
Lane Group Flow (vph)	288	105	0	0	8	0	219	737	0	7	647	92
Confl. Peds. (#/hr)	24		26	26		24	8		28	28		28
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	1%	3%	0%	0%	4%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	22.6	22.6			22.6		11.3	50.2		1.0	39.9	39.9
Effective Green, g (s)	23.1	23.1			23.1		11.3	51.2		1.0	40.9	40.9
Actuated g/C Ratio	0.26	0.26			0.26		0.13	0.59		0.01	0.47	0.47
Clearance Time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.3	2.3			2.5		2.3	4.3		2.3	4.3	4.3
Lane Grp Cap (vph)	349	387			406		231	1079		20	855	665
v/s Ratio Prot		0.07					c0.12	0.40		0.00	c0.35	
v/s Ratio Perm	c0.22				0.01							0.06
v/c Ratio	0.83	0.27			0.02		0.95	0.68		0.35	0.76	0.14
Uniform Delay, d1	30.2	25.4			23.7		37.7	12.4		42.8	19.1	13.2
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.2	0.2			0.0		44.2	2.0		6.1	4.2	0.2
Delay (s)	44.4	25.6			23.7		81.9	14.5		48.9	23.4	13.3
Level of Service	D	C			C		F	B		D	C	B
Approach Delay (s)		34.0			23.7			29.9			21.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	87.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	233	1	288	2	1	16	177	592	5	6	524	110
Future Volume (veh/h)	233	1	288	2	1	16	177	592	5	6	524	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.95		0.95	0.97		0.95	1.00		0.98	1.00		0.94
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	1870	1900	1885	1900	1900	1900	1885	1856	1900	1900	1841	1856
Adj Flow Rate, veh/h	288	1	183	2	1	14	219	731	6	7	647	87
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	2	0	1	0	0	0	1	3	0	0	4	3
Cap, veh/h	438	2	387	74	49	324	259	1062	9	13	812	655
Arrive On Green	0.26	0.26	0.25	0.25	0.26	0.25	0.14	0.58	0.56	0.01	0.44	0.44
Sat Flow, veh/h	1330	8	1519	78	194	1269	1795	1837	15	1810	1841	1486
Grp Volume(v), veh/h	288	0	184	17	0	0	219	0	737	7	647	87
Grp Sat Flow(s),veh/h/ln	1330	0	1528	1541	0	0	1795	0	1852	1810	1841	1486
Q Serve(g_s), s	14.6	0.0	7.7	0.0	0.0	0.0	8.9	0.0	21.0	0.3	22.8	2.6
Cycle Q Clear(g_c), s	15.3	0.0	7.7	0.6	0.0	0.0	8.9	0.0	21.0	0.3	22.8	2.6
Prop In Lane	1.00		0.99	0.12		0.82	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	438	0	390	436	0	0	259	0	1071	13	812	655
V/C Ratio(X)	0.66	0.00	0.47	0.04	0.00	0.00	0.85	0.00	0.69	0.53	0.80	0.13
Avail Cap(c_a), veh/h	559	0	529	503	0	0	263	0	1381	265	1372	1108
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	23.9	21.3	0.0	0.0	31.3	0.0	11.1	37.2	18.1	12.5
Incr Delay (d2), s/veh	1.2	0.0	0.5	0.0	0.0	0.0	20.9	0.0	1.4	19.1	2.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	2.7	0.2	0.0	0.0	5.2	0.0	7.4	0.2	9.2	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.7	0.0	24.5	21.3	0.0	0.0	52.2	0.0	12.5	56.3	21.0	12.6
LnGrp LOS	C	A	C	C	A	A	D	A	B	E	C	B
Approach Vol, veh/h		472			17			956			741	
Approach Delay, s/veh		26.4			21.3			21.6			20.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	47.4		23.2	14.8	37.1		23.2				
Change Period (Y+Rc), s	4.0	5.0		4.5	4.0	5.0		4.5				
Max Green Setting (Gmax), s	11.0	55.0		25.5	11.0	55.0		22.0				
Max Q Clear Time (g_c+I1), s	2.3	23.0		17.3	10.9	24.8		2.6				
Green Ext Time (p_c), s	0.0	8.3		1.4	0.0	7.4		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		22.2	
HCM 6th LOS		C	

Intersection	
Int Delay, s/veh	8.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	106	169	426	48	74	302
Future Vol, veh/h	106	169	426	48	74	302
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	65	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	3	3	1	8	4	1
Mvmt Flow	131	209	526	59	91	373

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1081	528	0	0	585	0
Stage 1	526	-	-	-	-	-
Stage 2	555	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.14	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.236	-
Pot Cap-1 Maneuver	240	548	-	-	980	-
Stage 1	591	-	-	-	-	-
Stage 2	573	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	218	547	-	-	980	-
Mov Cap-2 Maneuver	351	-	-	-	-	-
Stage 1	591	-	-	-	-	-
Stage 2	520	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	33.7	0	1.8
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	450	980	-
HCM Lane V/C Ratio	-	-	0.754	0.093	-
HCM Control Delay (s)	-	-	33.7	9.1	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	6.3	0.3	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	100	22	4	206	70	12
Future Vol, veh/h	100	22	4	206	70	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	5	2	2	3	0	0
Mvmt Flow	123	27	5	254	86	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	150	0	401	137
Stage 1	-	-	-	-	137	-
Stage 2	-	-	-	-	264	-
Critical Hdwy	-	-	4.12	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1431	-	609	917
Stage 1	-	-	-	-	895	-
Stage 2	-	-	-	-	785	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1431	-	607	917
Mov Cap-2 Maneuver	-	-	-	-	607	-
Stage 1	-	-	-	-	895	-
Stage 2	-	-	-	-	782	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	11.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	639	-	-	1431	-
HCM Lane V/C Ratio	0.158	-	-	0.003	-
HCM Control Delay (s)	11.7	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

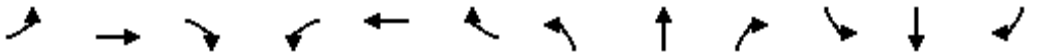
Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	↱
Traffic Vol, veh/h	179	0	9	0	0	0	25	2	0	0	0	127
Future Vol, veh/h	179	0	9	0	0	0	25	2	0	0	0	127
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	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	0	0	0	0	0	4	0	0	0	0	0
Mvmt Flow	229	0	12	0	0	0	32	3	0	0	0	163

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	12	0	0	465	465	6	467	471	-
Stage 1	-	-	-	-	-	-	464	464	-	1	1	-
Stage 2	-	-	-	-	-	-	1	1	-	466	470	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.14	6.5	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.2	-	-	3.536	4	3.3	3.5	4	-
Pot Cap-1 Maneuver	1622	-	-	1620	-	-	504	498	1083	509	494	0
Stage 1	-	-	-	-	-	-	575	567	-	1027	899	0
Stage 2	-	-	-	-	-	-	1017	899	-	581	563	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1622	-	-	1620	-	-	449	427	1083	451	424	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	449	427	-	451	424	-
Stage 1	-	-	-	-	-	-	493	486	-	881	899	-
Stage 2	-	-	-	-	-	-	1017	899	-	496	483	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	7.2	0	13.7	0
HCM LOS			B	A

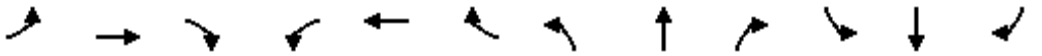
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	447	1622	-	-	1620	-	-	-	-
HCM Lane V/C Ratio	0.077	0.141	-	-	-	-	-	-	-
HCM Control Delay (s)	13.7	7.6	0	-	0	-	-	0	0
HCM Lane LOS	B	A	A	-	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0.5	-	-	0	-	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	0	523	0	0	0	544	472	0	0	386	53
Future Volume (vph)	45	0	523	0	0	0	544	472	0	0	386	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.3	4.7				4.9	4.0			4.0	
Lane Util. Factor		1.00	1.00				*0.85	1.00			0.95	
Frpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Flpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	1.00			0.98	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1703	1495				2868	1881			3457	
Flt Permitted		0.76	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1357	1495				2868	1881			3457	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	52	0	608	0	0	0	633	549	0	0	449	62
RTOR Reduction (vph)	0	0	104	0	0	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	52	504	0	0	0	633	549	0	0	502	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	6%	0%	8%	0%	0%	0%	7%	1%	0%	0%	2%	5%
Turn Type	Perm	NA	pm+ov				Prot	NA		Prot	NA	
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Actuated Green, G (s)		8.2	35.3				27.1	76.9			44.4	
Effective Green, g (s)		8.4	36.7				27.6	78.3			45.8	
Actuated g/C Ratio		0.09	0.39				0.29	0.82			0.48	
Clearance Time (s)		4.5	5.4				5.4	5.4			5.4	
Vehicle Extension (s)		2.5	2.3				2.3	4.4			4.4	
Lane Grp Cap (vph)		119	577				833	1550			1666	
v/s Ratio Prot			c0.26				0.22	c0.29			0.15	
v/s Ratio Perm		0.04	0.08									
v/c Ratio		0.44	0.87				0.76	0.35			0.30	
Uniform Delay, d1		41.1	27.0				30.7	2.1			14.9	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		1.9	13.6				3.7	0.6			0.5	
Delay (s)		42.9	40.6				34.4	2.7			15.4	
Level of Service		D	D				C	A			B	
Approach Delay (s)		40.8			0.0			19.7			15.4	
Approach LOS		D			A			B			B	

Intersection Summary					
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.60				
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	13.2		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A		
Analysis Period (min)	15				

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	0	523	0	0	0	544	472	0	0	386	53
Future Volume (veh/h)	45	0	523	0	0	0	544	472	0	0	386	53
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		0.99
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	1811	1900	1781	1900	1900	1900	1796	1885	1900	1900	1870	1826
Adj Flow Rate, veh/h	52	0	492	0	0	0	633	549	0	0	449	56
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	6	0	8	0	0	0	7	1	0	0	2	5
Cap, veh/h	314	0	654	0	320	0	758	674	0	612	1382	171
Arrive On Green	0.16	0.00	0.17	0.00	0.00	0.00	0.26	0.36	0.00	0.00	0.44	0.42
Sat Flow, veh/h	1440	0	1510	0	1900	0	2908	1885	0	1810	3176	394
Grp Volume(v), veh/h	52	0	492	0	0	0	633	549	0	0	250	255
Grp Sat Flow(s),veh/h/ln	1440	0	1510	0	1900	0	1454	1885	0	1810	1777	1794
Q Serve(g_s), s	3.0	0.0	16.2	0.0	0.0	0.0	19.5	25.1	0.0	0.0	8.8	8.9
Cycle Q Clear(g_c), s	3.0	0.0	16.2	0.0	0.0	0.0	19.5	25.1	0.0	0.0	8.8	8.9
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.00	1.00		0.22
Lane Grp Cap(c), veh/h	311	0	654	0	320	0	758	674	0	612	773	780
V/C Ratio(X)	0.17	0.00	0.75	0.00	0.00	0.00	0.83	0.81	0.00	0.00	0.32	0.33
Avail Cap(c_a), veh/h	311	0	654	0	320	0	1105	1151	0	612	773	780
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	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	34.4	0.0	22.6	0.0	0.0	0.0	33.2	27.7	0.0	0.0	17.6	17.8
Incr Delay (d2), s/veh	0.2	0.0	4.7	0.0	0.0	0.0	3.0	10.4	0.0	0.0	1.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	9.3	0.0	0.0	0.0	7.0	12.7	0.0	0.0	3.5	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.6	0.0	27.3	0.0	0.0	0.0	36.2	38.1	0.0	0.0	18.7	18.9
LnGrp LOS	C	A	C	A	A	A	D	D	A	A	B	B
Approach Vol, veh/h		544			0			1182			505	
Approach Delay, s/veh		28.0			0.0			37.1			18.8	
Approach LOS		C						D			B	

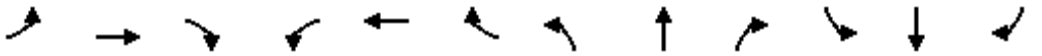
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	29.7	45.3		20.0	37.0	38.0		20.0				
Change Period (Y+Rc), s	* 5.4	* 5.4		4.5	* 5.4	* 5.4		4.5				
Max Green Setting (Gmax), s	* 36	* 29		15.5	* 8.5	* 57		15.5				
Max Q Clear Time (g_c+I1), s	21.5	10.9		0.0	0.0	27.1		18.2				
Green Ext Time (p_c), s	2.7	3.6		0.0	0.0	5.5		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		30.7	
HCM 6th LOS		C	

Notes

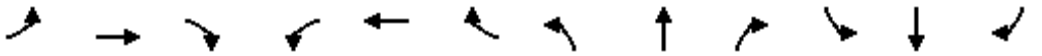
User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	3	169	1	1	12	186	684	3	5	745	258
Future Volume (vph)	191	3	169	1	1	12	186	684	3	5	745	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97			0.96		1.00	1.00		1.00	1.00	0.93
Flpb, ped/bikes	0.97	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85			0.88		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1583	1410			1444		1624	1643		1624	1710	1346
Flt Permitted	0.75	1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1246	1410			1430		1624	1643		1624	1710	1346
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	208	3	184	1	1	13	202	743	3	5	810	280
RTOR Reduction (vph)	0	146	0	0	10	0	0	0	0	0	0	62
Lane Group Flow (vph)	208	41	0	0	5	0	202	746	0	5	810	218
Confl. Peds. (#/hr)	12		4	4		12	4		19	19		19
Confl. Bikes (#/hr)			1						2			2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	19.7	19.7			19.7		11.3	62.2		1.1	52.0	52.0
Effective Green, g (s)	19.7	19.7			19.7		11.3	62.2		1.1	52.0	52.0
Actuated g/C Ratio	0.20	0.20			0.20		0.12	0.64		0.01	0.54	0.54
Clearance Time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.3	2.3			2.5		2.3	4.3		2.3	4.3	4.3
Lane Grp Cap (vph)	254	287			291		190	1059		18	921	725
v/s Ratio Prot		0.03					c0.12	0.45		0.00	c0.47	
v/s Ratio Perm	c0.17				0.00							0.16
v/c Ratio	0.82	0.14			0.02		1.06	0.70		0.28	0.88	0.30
Uniform Delay, d1	36.7	31.5			30.7		42.6	11.2		47.3	19.5	12.2
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	17.6	0.1			0.0		83.0	2.4		4.9	10.0	0.4
Delay (s)	54.3	31.6			30.7		125.6	13.6		52.2	29.5	12.6
Level of Service	D	C			C		F	B		D	C	B
Approach Delay (s)		43.6			30.7			37.4			25.3	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	33.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	96.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	3	169	1	1	12	186	684	3	5	745	258
Future Volume (veh/h)	191	3	169	1	1	12	186	684	3	5	745	258
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.95	0.98		0.97	1.00		0.96	1.00		0.96
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	1710	1710	1710	1710	1710	1710	1710	1657	1710	1710	1710	1710
Adj Flow Rate, veh/h	208	3	108	1	1	13	202	743	3	5	810	193
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, %	0	0	0	0	0	0	0	4	0	0	0	0
Cap, veh/h	324	7	259	48	32	239	201	1071	4	9	909	740
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.12	0.65	0.65	0.01	0.53	0.53
Sat Flow, veh/h	1242	37	1343	25	165	1238	1629	1649	7	1629	1710	1393
Grp Volume(v), veh/h	208	0	111	15	0	0	202	0	746	5	810	193
Grp Sat Flow(s),veh/h/ln	1242	0	1381	1428	0	0	1629	0	1655	1629	1710	1393
Q Serve(g_s), s	13.4	0.0	6.3	0.0	0.0	0.0	11.0	0.0	25.5	0.3	37.5	6.7
Cycle Q Clear(g_c), s	14.2	0.0	6.3	0.8	0.0	0.0	11.0	0.0	25.5	0.3	37.5	6.7
Prop In Lane	1.00		0.97	0.07		0.87	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	324	0	267	319	0	0	201	0	1076	9	909	740
V/C Ratio(X)	0.64	0.00	0.42	0.05	0.00	0.00	1.00	0.00	0.69	0.59	0.89	0.26
Avail Cap(c_a), veh/h	440	0	396	450	0	0	201	0	1076	201	1058	862
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.6	0.0	31.5	29.2	0.0	0.0	39.0	0.0	9.9	44.1	18.6	11.3
Incr Delay (d2), s/veh	1.3	0.0	0.6	0.0	0.0	0.0	64.1	0.0	2.2	33.6	9.4	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	4.4	0.0	2.1	0.3	0.0	0.0	7.8	0.0	8.2	0.2	15.4	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.9	0.0	32.1	29.3	0.0	0.0	103.0	0.0	12.2	77.8	28.0	11.6
LnGrp LOS	D	A	C	C	A	A	F	A	B	E	C	B
Approach Vol, veh/h		319			15			948			1008	
Approach Delay, s/veh		34.6			29.3			31.5			25.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	62.8		21.7	15.0	52.2		21.7				
Change Period (Y+Rc), s	4.0	5.0		4.5	4.0	5.0		4.5				
Max Green Setting (Gmax), s	11.0	55.0		25.5	11.0	55.0		25.5				
Max Q Clear Time (g_c+I1), s	2.3	27.5		16.2	13.0	39.5		2.8				
Green Ext Time (p_c), s	0.0	8.0		1.0	0.0	7.7		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		29.1	
HCM 6th LOS		C	

Intersection	
Int Delay, s/veh	5.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	69	140	557	145	165	631
Future Vol, veh/h	69	140	557	145	165	631
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	65	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	0	0	0	0	0
Mvmt Flow	76	154	612	159	181	693

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1667	612	0	0	771	0
Stage 1	612	-	-	-	-	-
Stage 2	1055	-	-	-	-	-
Critical Hdwy	6.42	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	106	497	-	-	853	-
Stage 1	541	-	-	-	-	-
Stage 2	335	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	84	497	-	-	853	-
Mov Cap-2 Maneuver	195	-	-	-	-	-
Stage 1	541	-	-	-	-	-
Stage 2	264	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	37.7	0	2.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	329	853	-
HCM Lane V/C Ratio	-	-	0.698	0.213	-
HCM Control Delay (s)	-	-	37.7	10.4	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q(veh)	-	-	5	0.8	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	236	75	13	167	43	8
Future Vol, veh/h	236	75	13	167	43	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	259	82	14	184	47	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	341	0	512	300
Stage 1	-	-	-	-	300	-
Stage 2	-	-	-	-	212	-
Critical Hdwy	-	-	4.12	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1218	-	525	744
Stage 1	-	-	-	-	756	-
Stage 2	-	-	-	-	828	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1218	-	518	744
Mov Cap-2 Maneuver	-	-	-	-	518	-
Stage 1	-	-	-	-	756	-
Stage 2	-	-	-	-	817	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	12.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	544	-	-	1218	-
HCM Lane V/C Ratio	0.103	-	-	0.012	-
HCM Control Delay (s)	12.4	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

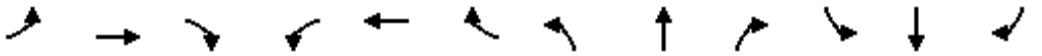
Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	131	0	25	0	0	0	22	3	0	0	4	165
Future Vol, veh/h	131	0	25	0	0	0	22	3	0	0	4	165
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	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	1	0	0	0	0	0	5	0	0	0	0	0
Mvmt Flow	144	0	27	0	0	0	24	3	0	0	4	181

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	27	0	0	305	303	14	304	316	-
Stage 1	-	-	-	-	-	-	302	302	-	1	1	-
Stage 2	-	-	-	-	-	-	3	1	-	303	315	-
Critical Hdwy	4.11	-	-	4.1	-	-	7.15	6.5	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.2	-	-	3.545	4	3.3	3.5	4	-
Pot Cap-1 Maneuver	1628	-	-	1600	-	-	641	613	1072	652	603	0
Stage 1	-	-	-	-	-	-	701	668	-	1027	899	0
Stage 2	-	-	-	-	-	-	1012	899	-	711	659	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1628	-	-	1600	-	-	594	558	1072	604	549	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	594	558	-	604	549	-
Stage 1	-	-	-	-	-	-	638	608	-	935	899	-
Stage 2	-	-	-	-	-	-	1007	899	-	644	600	-

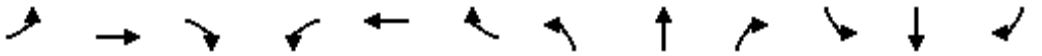
Approach	EB	WB	NB	SB
HCM Control Delay, s	6.2	0	11.4	11.6
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	589	1628	-	-	1600	-	-	549	-
HCM Lane V/C Ratio	0.047	0.088	-	-	-	-	-	0.008	-
HCM Control Delay (s)	11.4	7.4	0	-	0	-	-	11.6	0
HCM Lane LOS	B	A	A	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	0.3	-	-	0	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	0	589	0	0	0	583	676	0	0	647	44
Future Volume (vph)	50	0	589	0	0	0	583	676	0	0	647	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0				4.0	4.0			4.0	
Lane Util. Factor		1.00	1.00				*0.85	1.00			0.95	
Frpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Flpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	1.00			0.99	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1802	1583				2895	1900			3567	
Flt Permitted		0.76	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1436	1583				2895	1900			3567	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	55	0	647	0	0	0	641	743	0	0	711	48
RTOR Reduction (vph)	0	0	45	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	55	602	0	0	0	641	743	0	0	755	0
Confl. Peds. (#/hr)	1					1						
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	6%	0%	0%	0%	0%	4%
Turn Type	Perm	NA	pm+ov				Prot	NA		Prot	NA	
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Actuated Green, G (s)		8.2	44.3				36.1	86.9			45.4	
Effective Green, g (s)		8.7	47.1				37.5	88.3			46.8	
Actuated g/C Ratio		0.08	0.45				0.36	0.84			0.45	
Clearance Time (s)		4.5	5.4				5.4	5.4			5.4	
Vehicle Extension (s)		2.5	2.3				2.3	4.4			4.4	
Lane Grp Cap (vph)		118	710				1033	1597			1589	
v/s Ratio Prot			c0.30				0.22	c0.39			0.21	
v/s Ratio Perm		0.04	0.08									
v/c Ratio		0.47	0.85				0.62	0.47			0.48	
Uniform Delay, d1		45.9	25.8				27.9	2.2			20.5	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		2.1	9.1				0.9	1.0			1.0	
Delay (s)		48.0	34.8				28.8	3.2			21.5	
Level of Service		D	C				C	A			C	
Approach Delay (s)		35.9			0.0			15.0			21.5	
Approach LOS		D			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	0	589	0	0	0	583	676	0	0	647	44
Future Volume (veh/h)	50	0	589	0	0	0	583	676	0	0	647	44
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	1900	1900	1870	1900	1900	1900	1811	1900	1900	1900	1900	1841
Adj Flow Rate, veh/h	55	0	587	0	0	0	641	743	0	0	711	48
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	2	0	0	0	6	0	0	0	0	4
Cap, veh/h	274	0	662	0	271	0	781	873	0	480	1635	110
Arrive On Green	0.14	0.00	0.15	0.00	0.00	0.00	0.27	0.46	0.00	0.00	0.48	0.46
Sat Flow, veh/h	1435	0	1582	0	1900	0	2932	1900	0	1810	3432	232
Grp Volume(v), veh/h	55	0	587	0	0	0	641	743	0	0	374	385
Grp Sat Flow(s),veh/h/ln	1435	0	1582	0	1900	0	1466	1900	0	1810	1805	1858
Q Serve(g_s), s	3.6	0.0	15.9	0.0	0.0	0.0	21.5	36.5	0.0	0.0	14.4	14.4
Cycle Q Clear(g_c), s	3.6	0.0	15.9	0.0	0.0	0.0	21.5	36.5	0.0	0.0	14.4	14.4
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.00	1.00		0.12
Lane Grp Cap(c), veh/h	267	0	662	0	271	0	781	873	0	480	860	885
V/C Ratio(X)	0.21	0.00	0.89	0.00	0.00	0.00	0.82	0.85	0.00	0.00	0.43	0.44
Avail Cap(c_a), veh/h	267	0	662	0	271	0	1201	1249	0	480	860	885
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	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	40.3	0.0	28.3	0.0	0.0	0.0	36.2	25.2	0.0	0.0	18.1	18.2
Incr Delay (d2), s/veh	0.3	0.0	13.6	0.0	0.0	0.0	2.0	10.3	0.0	0.0	1.6	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	15.2	0.0	0.0	0.0	7.7	17.9	0.0	0.0	5.9	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.6	0.0	41.9	0.0	0.0	0.0	38.1	35.5	0.0	0.0	19.7	19.8
LnGrp LOS	D	A	D	A	A	A	D	D	A	A	B	B
Approach Vol, veh/h		642			0			1384			759	
Approach Delay, s/veh		41.8			0.0			36.7			19.8	
Approach LOS		D						D			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	32.0	54.0		19.0	33.8	52.2		19.0				
Change Period (Y+Rc), s	* 5.4	* 5.4		4.5	* 5.4	* 5.4		4.5				
Max Green Setting (Gmax), s	* 42	* 34		14.5	* 8.5	* 68		14.5				
Max Q Clear Time (g_c+I1), s	23.5	16.4		0.0	0.0	38.5		17.9				
Green Ext Time (p_c), s	3.0	5.6		0.0	0.0	8.4		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	33.3
HCM 6th LOS	C

Notes

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

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: SW Boones Ferry Road & SW Ibach Street/SW Ibach Court

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	TR	L	T	R
Maximum Queue (ft)	300	254	60	194	902	34	408	208
Average Queue (ft)	116	91	15	123	277	6	185	57
95th Queue (ft)	225	183	43	213	764	26	331	168
Link Distance (ft)	622	622	761		2493		697	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)				95		105		110
Storage Blk Time (%)				28	15		19	
Queuing Penalty (veh)				175	27		23	

Intersection: 2: SW Boones Ferry Road & SW Norwood Road

Movement	WB	NB	SB
Directions Served	LR	T	L
Maximum Queue (ft)	202	15	62
Average Queue (ft)	71	1	20
95th Queue (ft)	148	8	51
Link Distance (ft)	489	1810	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			290
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Intersection: 3: Site Access & SW Norwood Road

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	5	60
Average Queue (ft)	0	36
95th Queue (ft)	4	58
Link Distance (ft)	2644	350
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: SW 82nd Avenue & SW Norwood Road/Driveway

Movement	NB
Directions Served	LTR
Maximum Queue (ft)	48
Average Queue (ft)	17
95th Queue (ft)	41
Link Distance (ft)	494
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: SW Boones Ferry Road & SW Day Road

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	L	TR	T	TR
Maximum Queue (ft)	89	244	297	462	204	147	172
Average Queue (ft)	35	115	168	223	51	67	71
95th Queue (ft)	75	213	289	358	145	130	147
Link Distance (ft)	727	727		930	930	1961	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			200				500
Storage Blk Time (%)			3	14		3	
Queuing Penalty (veh)			7	39		6	

Zone Summary

Zone wide Queuing Penalty: 278

Intersection: 1: SW Boones Ferry Road & SW Ibach Street/SW Ibach Court

Movement	EB	EB	WB	NB	NB	SB	SB	SB	B21
Directions Served	L	TR	LTR	L	TR	L	T	R	T
Maximum Queue (ft)	204	146	34	195	964	139	718	210	85
Average Queue (ft)	107	70	9	153	445	9	360	140	4
95th Queue (ft)	174	129	31	229	1176	59	654	276	51
Link Distance (ft)	622	622	761		2493		697		2246
Upstream Blk Time (%)							2		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)				95		105		110	
Storage Blk Time (%)				49	16		30	0	
Queuing Penalty (veh)				337	29		80	0	

Intersection: 2: SW Boones Ferry Road & SW Norwood Road

Movement	WB	NB	SB
Directions Served	LR	R	L
Maximum Queue (ft)	334	27	113
Average Queue (ft)	128	2	49
95th Queue (ft)	315	14	89
Link Distance (ft)	489		
Upstream Blk Time (%)	1		
Queuing Penalty (veh)	2		
Storage Bay Dist (ft)		65	290
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Intersection: 3: Site Access & SW Norwood Road

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	49	53
Average Queue (ft)	5	27
95th Queue (ft)	30	49
Link Distance (ft)	2644	350
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: SW 82nd Avenue & SW Norwood Road/Driveway

Movement	EB	NB	SB	SB
Directions Served	LTR	LTR	LT	R
Maximum Queue (ft)	6	43	31	8
Average Queue (ft)	0	18	3	0
95th Queue (ft)	4	41	19	0
Link Distance (ft)	2644	494	648	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				15
Storage Blk Time (%)			0	
Queuing Penalty (veh)			1	

Intersection: 6: SW Boones Ferry Road & SW Day Road

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	L	TR	T	TR
Maximum Queue (ft)	87	341	299	492	313	228	253
Average Queue (ft)	33	148	190	246	87	110	126
95th Queue (ft)	71	268	315	383	227	200	233
Link Distance (ft)	727	727		930	930	1961	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			200				500
Storage Blk Time (%)			3	18		10	
Queuing Penalty (veh)			8	52		36	

Zone Summary

Zone wide Queuing Penalty: 545

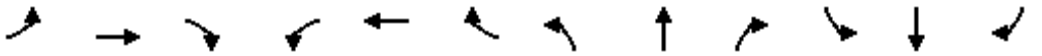
2026 Buildout Conditions
With Basalt Creek Parkway Extension

AM Peak Hour Synchro Reports

PM Peak Hour Synchro Reports

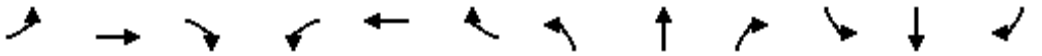
AM Peak Hour Queuing Reports

PM Peak Hour Queuing Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	1	287	2	1	16	171	666	5	6	620	82
Future Volume (vph)	175	1	287	2	1	16	171	666	5	6	620	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.92			0.94		1.00	1.00		1.00	1.00	0.91
Flpb, ped/bikes	0.96	1.00			1.00		1.00	1.00		0.97	1.00	1.00
Frt	1.00	0.85			0.88		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1692	1469			1573		1787	1842		1757	1827	1426
Flt Permitted	0.74	1.00			0.93		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1322	1469			1471		1787	1842		1757	1827	1426
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	216	1	354	2	1	20	211	822	6	7	765	101
RTOR Reduction (vph)	0	211	0	0	16	0	0	0	0	0	0	51
Lane Group Flow (vph)	216	144	0	0	7	0	211	828	0	7	765	50
Confl. Peds. (#/hr)	24		26	26		24	8		28	28		28
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	1%	3%	0%	0%	4%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	17.3	17.3			17.3		11.8	51.6		0.7	40.5	40.5
Effective Green, g (s)	17.8	17.8			17.8		11.8	52.6		0.7	41.5	41.5
Actuated g/C Ratio	0.21	0.21			0.21		0.14	0.63		0.01	0.50	0.50
Clearance Time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.3	2.3			2.5		2.3	4.3		2.3	4.3	4.3
Lane Grp Cap (vph)	283	314			315		253	1165		14	912	712
v/s Ratio Prot		0.10					c0.12	0.45		0.00	c0.42	
v/s Ratio Perm	c0.16				0.00							0.04
v/c Ratio	0.76	0.46			0.02		0.83	0.71		0.50	0.84	0.07
Uniform Delay, d1	30.7	28.5			25.8		34.7	10.2		41.0	17.9	10.8
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.8	0.6			0.0		19.9	2.3		15.4	7.3	0.1
Delay (s)	41.5	29.1			25.8		54.6	12.5		56.4	25.2	10.9
Level of Service	D	C			C		D	B		E	C	B
Approach Delay (s)		33.8			25.8			21.0			23.8	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	83.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	1	287	2	1	16	171	666	5	6	620	82
Future Volume (veh/h)	175	1	287	2	1	16	171	666	5	6	620	82
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.94		0.94	0.96		0.94	1.00		0.98	1.00		0.95
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	1870	1900	1885	1900	1900	1900	1885	1856	1900	1900	1841	1856
Adj Flow Rate, veh/h	216	1	181	2	1	14	211	822	6	7	765	52
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	2	0	1	0	0	0	1	3	0	0	4	3
Cap, veh/h	382	2	323	69	43	271	253	1136	8	13	891	721
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.14	0.62	0.60	0.01	0.48	0.48
Sat Flow, veh/h	1317	8	1503	70	201	1261	1795	1839	13	1810	1841	1491
Grp Volume(v), veh/h	216	0	182	17	0	0	211	0	828	7	765	52
Grp Sat Flow(s),veh/h/ln	1317	0	1511	1531	0	0	1795	0	1853	1810	1841	1491
Q Serve(g_s), s	10.7	0.0	8.1	0.0	0.0	0.0	8.6	0.0	23.1	0.3	27.5	1.4
Cycle Q Clear(g_c), s	11.3	0.0	8.1	0.6	0.0	0.0	8.6	0.0	23.1	0.3	27.5	1.4
Prop In Lane	1.00		0.99	0.12		0.82	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	382	0	325	373	0	0	253	0	1144	13	891	721
V/C Ratio(X)	0.56	0.00	0.56	0.05	0.00	0.00	0.83	0.00	0.72	0.53	0.86	0.07
Avail Cap(c_a), veh/h	504	0	464	509	0	0	288	0	1263	97	1058	857
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.4	0.0	26.5	23.5	0.0	0.0	31.3	0.0	9.9	37.0	17.1	10.3
Incr Delay (d2), s/veh	0.8	0.0	0.9	0.0	0.0	0.0	15.9	0.0	2.2	19.1	7.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	2.9	0.2	0.0	0.0	4.6	0.0	8.0	0.2	11.7	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.2	0.0	27.4	23.5	0.0	0.0	47.2	0.0	12.1	56.1	24.1	10.4
LnGrp LOS	C	A	C	C	A	A	D	A	B	E	C	B
Approach Vol, veh/h		398			17			1039			824	
Approach Delay, s/veh		27.8			23.5			19.2			23.5	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	50.2		20.1	14.5	40.2		20.1				
Change Period (Y+Rc), s	4.0	5.0		4.5	4.0	5.0		4.5				
Max Green Setting (Gmax), s	4.0	50.0		22.5	12.0	42.0		22.5				
Max Q Clear Time (g_c+I1), s	2.3	25.1		13.3	10.6	29.5		2.6				
Green Ext Time (p_c), s	0.0	9.0		1.2	0.1	5.7		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			22.3									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	11.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	115	156	503	50	70	393
Future Vol, veh/h	115	156	503	50	70	393
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	65	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	3	3	1	8	4	1
Mvmt Flow	142	193	621	62	86	485

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1278	623	0	0	683	0
Stage 1	621	-	-	-	-	-
Stage 2	657	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.14	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.236	-
Pot Cap-1 Maneuver	183	484	-	-	901	-
Stage 1	534	-	-	-	-	-
Stage 2	514	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	166	483	-	-	901	-
Mov Cap-2 Maneuver	302	-	-	-	-	-
Stage 1	534	-	-	-	-	-
Stage 2	465	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	52.1	0	1.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	385	901	-
HCM Lane V/C Ratio	-	-	0.869	0.096	-
HCM Control Delay (s)	-	-	52.1	9.4	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	8.5	0.3	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	98	22	4	202	70	12
Future Vol, veh/h	98	22	4	202	70	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	5	2	2	3	0	0
Mvmt Flow	121	27	5	249	86	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	148	0	394	135
Stage 1	-	-	-	-	135	-
Stage 2	-	-	-	-	259	-
Critical Hdwy	-	-	4.12	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1434	-	615	919
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	789	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1434	-	613	919
Mov Cap-2 Maneuver	-	-	-	-	613	-
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	786	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	11.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	644	-	-	1434	-
HCM Lane V/C Ratio	0.157	-	-	0.003	-
HCM Control Delay (s)	11.6	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

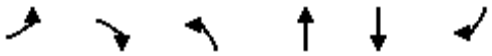
Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↕	↱
Traffic Vol, veh/h	179	0	9	0	0	0	25	2	0	0	0	128
Future Vol, veh/h	179	0	9	0	0	0	25	2	0	0	0	128
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	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	0	0	0	0	0	4	0	0	0	0	0
Mvmt Flow	229	0	12	0	0	0	32	3	0	0	0	164

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	12	0	0	465	465	6	467	471	-
Stage 1	-	-	-	-	-	-	464	464	-	1	1	-
Stage 2	-	-	-	-	-	-	1	1	-	466	470	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.14	6.5	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.2	-	-	3.536	4	3.3	3.5	4	-
Pot Cap-1 Maneuver	1622	-	-	1620	-	-	504	498	1083	509	494	0
Stage 1	-	-	-	-	-	-	575	567	-	1027	899	0
Stage 2	-	-	-	-	-	-	1017	899	-	581	563	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1622	-	-	1620	-	-	449	427	1083	451	424	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	449	427	-	451	424	-
Stage 1	-	-	-	-	-	-	493	486	-	881	899	-
Stage 2	-	-	-	-	-	-	1017	899	-	496	483	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	7.2	0	13.7	0
HCM LOS			B	A

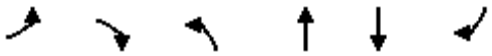
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	447	1622	-	-	1620	-	-	-	-
HCM Lane V/C Ratio	0.077	0.141	-	-	-	-	-	-	-
HCM Control Delay (s)	13.7	7.6	0	-	0	-	-	0	0
HCM Lane LOS	B	A	A	-	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0.5	-	-	0	-	-	-	-



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	41	524	454	557	440	115
Future Volume (vph)	41	524	454	557	440	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1805	1615	1687	1881	1795	
Flt Permitted	0.95	1.00	0.24	1.00	1.00	
Satd. Flow (perm)	1805	1615	422	1881	1795	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	48	609	528	648	512	134
RTOR Reduction (vph)	0	126	0	0	8	0
Lane Group Flow (vph)	48	483	528	648	638	0
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	0%	0%	7%	1%	2%	5%
Turn Type	Prot	pt+ov	pm+pt	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases			6			
Actuated Green, G (s)	8.9	38.7	76.2	76.2	46.4	
Effective Green, g (s)	9.4	34.3	77.6	77.6	47.8	
Actuated g/C Ratio	0.10	0.36	0.82	0.82	0.50	
Clearance Time (s)	4.5		5.4	5.4	5.4	
Vehicle Extension (s)	2.5		2.3	4.4	4.4	
Lane Grp Cap (vph)	178	583	688	1536	903	
v/s Ratio Prot	0.03	c0.30	0.21	0.34	0.36	
v/s Ratio Perm			c0.42			
v/c Ratio	0.27	0.83	0.77	0.42	0.71	
Uniform Delay, d1	39.6	27.7	16.5	2.4	18.2	
Progression Factor	1.00	1.00	1.02	1.34	1.00	
Incremental Delay, d2	0.6	9.3	3.7	0.7	4.6	
Delay (s)	40.2	36.9	20.5	3.9	22.8	
Level of Service	D	D	C	A	C	
Approach Delay (s)	37.2			11.4	22.8	
Approach LOS	D			B	C	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	41	524	454	557	440	115
Future Volume (veh/h)	41	524	454	557	440	115
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1796	1885	1870	1826
Adj Flow Rate, veh/h	48	493	528	648	512	122
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	7	1	2	5
Cap, veh/h	124	775	807	1597	556	133
Arrive On Green	0.07	0.07	0.42	0.85	0.38	0.37
Sat Flow, veh/h	1810	1610	1711	1885	1453	346
Grp Volume(v), veh/h	48	493	528	648	0	634
Grp Sat Flow(s),veh/h/ln	1810	1610	1711	1885	0	1799
Q Serve(g_s), s	2.4	0.0	17.7	7.6	0.0	31.9
Cycle Q Clear(g_c), s	2.4	0.0	17.7	7.6	0.0	31.9
Prop In Lane	1.00	1.00	1.00			0.19
Lane Grp Cap(c), veh/h	124	775	807	1597	0	689
V/C Ratio(X)	0.39	0.64	0.65	0.41	0.00	0.92
Avail Cap(c_a), veh/h	318	948	807	1597	0	705
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.3	18.4	19.5	1.7	0.0	28.1
Incr Delay (d2), s/veh	1.5	0.8	1.7	0.8	0.0	19.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	7.8	8.8	1.5	0.0	16.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	43.8	19.2	21.2	2.5	0.0	47.6
LnGrp LOS	D	B	C	A	A	D
Approach Vol, veh/h	541			1176	634	
Approach Delay, s/veh	21.4			10.9	47.6	
Approach LOS	C			B	D	

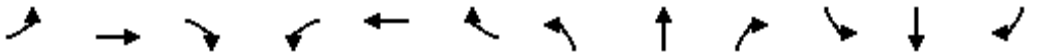
Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	44.1	40.4				84.5	10.5
Change Period (Y+Rc), s	* 5.4	* 5.4				* 5.4	4.5
Max Green Setting (Gmax), s	* 28	* 36				* 69	16.2
Max Q Clear Time (g_c+I1), s	19.7	33.9				9.6	4.4
Green Ext Time (p_c), s	0.8	1.0				9.4	1.2

Intersection Summary	
HCM 6th Ctrl Delay	23.2
HCM 6th LOS	C

Notes

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

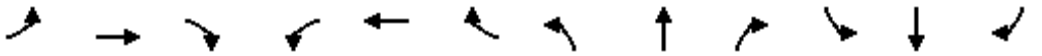
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	0	261	0	0	0	272	977	0	0	936	17
Future Volume (vph)	18	0	261	0	0	0	272	977	0	0	936	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.3	4.7				4.9	4.0			4.0	
Lane Util. Factor		1.00	1.00				0.97	1.00			0.95	
Frpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Flpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	1.00			1.00	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1703	1495				3273	1881			3527	
Flt Permitted		0.87	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1559	1495				3273	1881			3527	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	21	0	303	0	0	0	316	1136	0	0	1088	20
RTOR Reduction (vph)	0	0	72	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	21	231	0	0	0	316	1136	0	0	1107	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	6%	0%	8%	0%	0%	0%	7%	1%	0%	0%	2%	5%
Turn Type	Perm	NA	pm+ov				Prot	NA		Prot	NA	
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Actuated Green, G (s)		4.4	19.8				15.4	80.7			59.9	
Effective Green, g (s)		4.6	21.2				15.9	82.1			61.3	
Actuated g/C Ratio		0.05	0.22				0.17	0.86			0.65	
Clearance Time (s)		4.5	5.4				5.4	5.4			5.4	
Vehicle Extension (s)		2.5	2.3				2.3	4.4			4.4	
Lane Grp Cap (vph)		75	333				547	1625			2275	
v/s Ratio Prot			c0.12				0.10	c0.60			0.31	
v/s Ratio Perm		0.01	0.04									
v/c Ratio		0.28	0.69				0.58	0.70			0.49	
Uniform Delay, d1		43.6	33.9				36.5	2.2			8.7	
Progression Factor		1.00	1.00				1.00	1.00			0.87	
Incremental Delay, d2		1.5	5.4				1.1	2.5			0.5	
Delay (s)		45.1	39.3				37.6	4.7			8.1	
Level of Service		D	D				D	A			A	
Approach Delay (s)		39.7			0.0			11.9			8.1	
Approach LOS		D			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	13.2
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	0	261	0	0	0	272	977	0	0	936	17
Future Volume (veh/h)	18	0	261	0	0	0	272	977	0	0	936	17
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		0.99
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	1811	1900	1781	1900	1900	1900	1796	1885	1900	1900	1870	1826
Adj Flow Rate, veh/h	21	0	280	0	0	0	316	1136	0	0	1088	14
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	6	0	8	0	0	0	7	1	0	0	2	5
Cap, veh/h	170	0	303	0	130	0	425	1270	0	221	2399	31
Arrive On Green	0.06	0.00	0.07	0.00	0.00	0.00	0.13	0.67	0.00	0.00	0.67	0.65
Sat Flow, veh/h	1440	0	1510	0	1900	0	3319	1885	0	1810	3592	46
Grp Volume(v), veh/h	21	0	280	0	0	0	316	1136	0	0	538	564
Grp Sat Flow(s),veh/h/ln	1440	0	1510	0	1900	0	1659	1885	0	1810	1777	1861
Q Serve(g_s), s	1.3	0.0	6.7	0.0	0.0	0.0	8.7	47.0	0.0	0.0	13.7	13.7
Cycle Q Clear(g_c), s	1.3	0.0	6.7	0.0	0.0	0.0	8.7	47.0	0.0	0.0	13.7	13.7
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.00	1.00		0.02
Lane Grp Cap(c), veh/h	167	0	303	0	130	0	425	1270	0	221	1187	1243
V/C Ratio(X)	0.13	0.00	0.92	0.00	0.00	0.00	0.74	0.89	0.00	0.00	0.45	0.45
Avail Cap(c_a), veh/h	167	0	303	0	130	0	695	1429	0	221	1187	1243
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	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	42.2	0.0	37.3	0.0	0.0	0.0	39.9	12.7	0.0	0.0	7.5	7.5
Incr Delay (d2), s/veh	0.2	0.0	32.6	0.0	0.0	0.0	1.6	10.0	0.0	0.0	1.3	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	8.8	0.0	0.0	0.0	3.6	19.3	0.0	0.0	4.4	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.5	0.0	69.8	0.0	0.0	0.0	41.5	22.7	0.0	0.0	8.8	8.7
LnGrp LOS	D	A	E	A	A	A	D	C	A	A	A	A
Approach Vol, veh/h		301			0			1452			1102	
Approach Delay, s/veh		67.9			0.0			26.8			8.7	
Approach LOS		E						C			A	

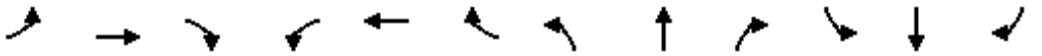
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.1	67.4		10.5	16.5	68.0		10.5				
Change Period (Y+Rc), s	* 5.4	* 5.4		4.5	* 5.4	* 5.4		4.5				
Max Green Setting (Gmax), s	* 19	* 54		6.0	* 4	* 71		6.0				
Max Q Clear Time (g_c+I1), s	10.7	15.7		0.0	0.0	49.0		8.7				
Green Ext Time (p_c), s	0.9	12.4		0.0	0.0	13.5		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		24.2
HCM 6th LOS		C

Notes

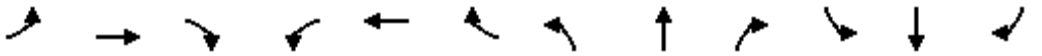
User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	3	163	1	1	12	181	650	3	5	824	193
Future Volume (vph)	144	3	163	1	1	12	181	650	3	5	824	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97			0.96		1.00	1.00		1.00	1.00	0.93
Flpb, ped/bikes	0.98	1.00			1.00		1.00	1.00		0.98	1.00	1.00
Frt	1.00	0.85			0.88		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1760	1567			1607		1805	1825		1762	1900	1499
Flt Permitted	0.75	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1386	1567			1586		1805	1825		1762	1900	1499
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	157	3	177	1	1	13	197	707	3	5	896	210
RTOR Reduction (vph)	0	148	0	0	11	0	0	0	0	0	0	45
Lane Group Flow (vph)	157	32	0	0	4	0	197	710	0	5	896	165
Confl. Peds. (#/hr)	12		4	4		12	4		19	19		19
Confl. Bikes (#/hr)			1						2			2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	15.3	15.3			15.3		12.8	63.0		0.7	50.9	50.9
Effective Green, g (s)	15.3	15.3			15.3		12.8	63.0		0.7	50.9	50.9
Actuated g/C Ratio	0.17	0.17			0.17		0.14	0.68		0.01	0.55	0.55
Clearance Time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.3	2.3			2.5		2.3	4.3		2.3	4.3	4.3
Lane Grp Cap (vph)	229	259			262		249	1242		13	1045	824
v/s Ratio Prot		0.02					c0.11	0.39		0.00	c0.47	
v/s Ratio Perm	c0.11				0.00							0.11
v/c Ratio	0.69	0.12			0.02		0.79	0.57		0.38	0.86	0.20
Uniform Delay, d1	36.3	32.9			32.3		38.6	7.7		45.7	17.7	10.5
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.2	0.1			0.0		15.0	0.8		10.7	7.5	0.2
Delay (s)	43.5	33.0			32.3		53.5	8.5		56.4	25.2	10.7
Level of Service	D	C			C		D	A		E	C	B
Approach Delay (s)		37.9			32.3			18.3			22.6	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	92.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	3	163	1	1	12	181	650	3	5	824	193
Future Volume (veh/h)	144	3	163	1	1	12	181	650	3	5	824	193
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.94	0.97		0.96	1.00		0.97	1.00		0.96
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	1900	1900	1900	1900	1900	1900	1841	1900	1900	1900	1900
Adj Flow Rate, veh/h	157	3	90	1	1	13	197	707	3	5	896	123
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, %	0	0	0	0	0	0	0	4	0	0	0	0
Cap, veh/h	300	8	227	50	29	211	236	1243	5	9	1051	857
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.13	0.68	0.68	0.01	0.55	0.55
Sat Flow, veh/h	1369	49	1474	24	186	1367	1810	1831	8	1810	1900	1549
Grp Volume(v), veh/h	157	0	93	15	0	0	197	0	710	5	896	123
Grp Sat Flow(s),veh/h/ln	1369	0	1523	1577	0	0	1810	0	1839	1810	1900	1549
Q Serve(g_s), s	8.3	0.0	4.6	0.0	0.0	0.0	8.9	0.0	16.8	0.2	33.2	3.2
Cycle Q Clear(g_c), s	8.9	0.0	4.6	0.7	0.0	0.0	8.9	0.0	16.8	0.2	33.2	3.2
Prop In Lane	1.00		0.97	0.07		0.87	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	300	0	235	289	0	0	236	0	1248	9	1051	857
V/C Ratio(X)	0.52	0.00	0.40	0.05	0.00	0.00	0.83	0.00	0.57	0.53	0.85	0.14
Avail Cap(c_a), veh/h	393	0	338	394	0	0	282	0	1522	87	1367	1115
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.5	0.0	31.8	30.1	0.0	0.0	35.4	0.0	7.0	41.4	15.7	9.0
Incr Delay (d2), s/veh	0.9	0.0	0.7	0.1	0.0	0.0	15.1	0.0	0.7	24.9	5.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	1.7	0.3	0.0	0.0	4.8	0.0	5.2	0.2	13.7	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.4	0.0	32.4	30.2	0.0	0.0	50.5	0.0	7.7	66.3	20.8	9.2
LnGrp LOS	C	A	C	C	A	A	D	A	A	E	C	A
Approach Vol, veh/h		250			15			907			1024	
Approach Delay, s/veh		33.7			30.2			17.0			19.6	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.4	61.6		17.4	14.9	51.1		17.4				
Change Period (Y+Rc), s	4.0	5.0		4.5	4.0	5.0		4.5				
Max Green Setting (Gmax), s	4.0	69.0		18.5	13.0	60.0		18.5				
Max Q Clear Time (g_c+I1), s	2.2	18.8		10.9	10.9	35.2		2.7				
Green Ext Time (p_c), s	0.0	8.5		0.6	0.1	10.9		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		20.2	
HCM 6th LOS		C	

Notes

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

Intersection	
Int Delay, s/veh	5.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	75	131	523	154	152	714
Future Vol, veh/h	75	131	523	154	152	714
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	65	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	0	0	0	0	0
Mvmt Flow	82	144	575	169	167	785

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1694	575	0	0	744	0
Stage 1	575	-	-	-	-	-
Stage 2	1119	-	-	-	-	-
Critical Hdwy	6.42	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	102	521	-	-	873	-
Stage 1	563	-	-	-	-	-
Stage 2	312	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	83	521	-	-	873	-
Mov Cap-2 Maneuver	190	-	-	-	-	-
Stage 1	563	-	-	-	-	-
Stage 2	252	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	39.7	0	1.8
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	319	873	-
HCM Lane V/C Ratio	-	-	0.71	0.191	-
HCM Control Delay (s)	-	-	39.7	10.1	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q(veh)	-	-	5.1	0.7	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	232	75	13	164	43	8
Future Vol, veh/h	232	75	13	164	43	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	255	82	14	180	47	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	337	0	504	296
Stage 1	-	-	-	-	296	-
Stage 2	-	-	-	-	208	-
Critical Hdwy	-	-	4.12	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1222	-	531	748
Stage 1	-	-	-	-	759	-
Stage 2	-	-	-	-	832	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1222	-	524	748
Mov Cap-2 Maneuver	-	-	-	-	524	-
Stage 1	-	-	-	-	759	-
Stage 2	-	-	-	-	821	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	550	-	-	1222	-
HCM Lane V/C Ratio	0.102	-	-	0.012	-
HCM Control Delay (s)	12.3	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

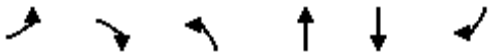
Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			↕	↱
Traffic Vol, veh/h	131	0	25	0	0	0	22	3	0	0	4	164
Future Vol, veh/h	131	0	25	0	0	0	22	3	0	0	4	164
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	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	1	0	0	0	0	0	5	0	0	0	0	0
Mvmt Flow	144	0	27	0	0	0	24	3	0	0	4	180

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	27	0	0	305	303	14	304	316	-
Stage 1	-	-	-	-	-	-	302	302	-	1	1	-
Stage 2	-	-	-	-	-	-	3	1	-	303	315	-
Critical Hdwy	4.11	-	-	4.1	-	-	7.15	6.5	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.2	-	-	3.545	4	3.3	3.5	4	-
Pot Cap-1 Maneuver	1628	-	-	1600	-	-	641	613	1072	652	603	0
Stage 1	-	-	-	-	-	-	701	668	-	1027	899	0
Stage 2	-	-	-	-	-	-	1012	899	-	711	659	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1628	-	-	1600	-	-	594	558	1072	604	549	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	594	558	-	604	549	-
Stage 1	-	-	-	-	-	-	638	608	-	935	899	-
Stage 2	-	-	-	-	-	-	1007	899	-	644	600	-

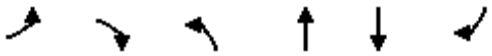
Approach	EB	WB	NB	SB
HCM Control Delay, s	6.2	0	11.4	11.6
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	589	1628	-	-	1600	-	-	549	-
HCM Lane V/C Ratio	0.047	0.088	-	-	-	-	-	0.008	-
HCM Control Delay (s)	11.4	7.4	0	-	0	-	-	11.6	0
HCM Lane LOS	B	A	A	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	0.3	-	-	0	-	-	0	-



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	80	486	454	646	653	137
Future Volume (vph)	80	486	454	646	653	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1805	1615	1703	1900	1843	
Flt Permitted	0.95	1.00	0.09	1.00	1.00	
Satd. Flow (perm)	1805	1615	169	1900	1843	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	88	534	499	710	718	151
RTOR Reduction (vph)	0	101	0	0	7	0
Lane Group Flow (vph)	88	433	499	710	862	0
Heavy Vehicles (%)	0%	0%	6%	0%	0%	4%
Turn Type	Prot	pt+ov	pm+pt	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases			6			
Actuated Green, G (s)	9.9	41.5	85.2	85.2	53.6	
Effective Green, g (s)	10.4	37.1	86.6	86.6	55.0	
Actuated g/C Ratio	0.10	0.35	0.82	0.82	0.52	
Clearance Time (s)	4.5		5.4	5.4	5.4	
Vehicle Extension (s)	2.5		2.3	4.4	4.4	
Lane Grp Cap (vph)	178	570	542	1567	965	
v/s Ratio Prot	0.05	c0.27	c0.24	0.37	0.47	
v/s Ratio Perm			c0.52			
v/c Ratio	0.49	0.76	0.92	0.45	0.89	
Uniform Delay, d1	44.8	30.0	29.1	2.6	22.4	
Progression Factor	1.00	1.00	0.99	1.23	1.00	
Incremental Delay, d2	1.6	5.5	16.9	0.7	12.4	
Delay (s)	46.4	35.5	45.7	3.9	34.8	
Level of Service	D	D	D	A	C	
Approach Delay (s)	37.1			21.1	34.8	
Approach LOS	D			C	C	

Intersection Summary			
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	80	486	454	646	653	137
Future Volume (veh/h)	80	486	454	646	653	137
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1811	1900	1900	1841
Adj Flow Rate, veh/h	88	435	499	710	718	146
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	6	0	0	4
Cap, veh/h	143	630	622	1605	744	151
Arrive On Green	0.08	0.08	0.32	0.84	0.49	0.47
Sat Flow, veh/h	1810	1610	1725	1900	1532	312
Grp Volume(v), veh/h	88	435	499	710	0	864
Grp Sat Flow(s),veh/h/ln	1810	1610	1725	1900	0	1844
Q Serve(g_s), s	4.9	0.0	23.2	9.7	0.0	47.6
Cycle Q Clear(g_c), s	4.9	0.0	23.2	9.7	0.0	47.6
Prop In Lane	1.00	1.00	1.00			0.17
Lane Grp Cap(c), veh/h	143	630	622	1605	0	896
V/C Ratio(X)	0.61	0.69	0.80	0.44	0.00	0.96
Avail Cap(c_a), veh/h	241	718	622	1605	0	896
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.8	26.6	30.5	2.0	0.0	26.2
Incr Delay (d2), s/veh	3.2	2.1	7.1	0.9	0.0	22.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	9.2	12.3	2.3	0.0	25.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	49.9	28.8	37.6	2.9	0.0	48.9
LnGrp LOS	D	C	D	A	A	D
Approach Vol, veh/h	523			1209	864	
Approach Delay, s/veh	32.3			17.2	48.9	
Approach LOS	C			B	D	

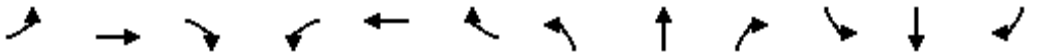
Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	37.7	55.0				92.7	12.3
Change Period (Y+Rc), s	* 5.4	* 5.4				* 5.4	4.5
Max Green Setting (Gmax), s	* 27	* 50				* 82	13.5
Max Q Clear Time (g_c+I1), s	25.2	49.6				11.7	6.9
Green Ext Time (p_c), s	0.2	0.0				11.1	0.9

Intersection Summary	
HCM 6th Ctrl Delay	30.8
HCM 6th LOS	C

Notes

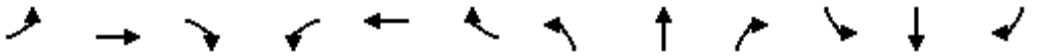
User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	0	294	0	0	0	292	1076	0	0	1112	15
Future Volume (vph)	16	0	294	0	0	0	292	1076	0	0	1112	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0				4.0	4.0			4.0	
Lane Util. Factor		1.00	1.00				0.97	1.00			0.95	
Frpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Flpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	1.00			1.00	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1803	1583				3303	1900			3601	
Flt Permitted		0.87	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1651	1583				3303	1900			3601	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	18	0	323	0	0	0	321	1182	0	0	1222	16
RTOR Reduction (vph)	0	0	62	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	18	261	0	0	0	321	1182	0	0	1237	0
Confl. Peds. (#/hr)	1					1						
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	6%	0%	0%	0%	0%	4%
Turn Type	Perm	NA	pm+ov				Prot	NA		Prot	NA	
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Actuated Green, G (s)		4.1	21.8				17.7	91.0			67.9	
Effective Green, g (s)		4.6	24.6				19.1	92.4			69.3	
Actuated g/C Ratio		0.04	0.23				0.18	0.88			0.66	
Clearance Time (s)		4.5	5.4				5.4	5.4			5.4	
Vehicle Extension (s)		2.5	2.3				2.3	4.4			4.4	
Lane Grp Cap (vph)		72	370				600	1672			2376	
v/s Ratio Prot			c0.13				0.10	c0.62			0.34	
v/s Ratio Perm		0.01	0.04									
v/c Ratio		0.25	0.71				0.54	0.71			0.52	
Uniform Delay, d1		48.5	36.9				38.9	2.0			9.2	
Progression Factor		1.00	1.00				1.00	1.00			0.84	
Incremental Delay, d2		1.3	5.3				0.6	2.5			0.5	
Delay (s)		49.9	42.2				39.5	4.5			8.2	
Level of Service		D	D				D	A			A	
Approach Delay (s)		42.6			0.0			12.0			8.2	
Approach LOS		D			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	294	0	0	0	292	1076	0	0	1112	15
Future Volume (veh/h)	16	0	294	0	0	0	292	1076	0	0	1112	15
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	1900	1900	1870	1900	1900	1900	1811	1900	1900	1900	1900	1841
Adj Flow Rate, veh/h	18	0	301	0	0	0	321	1182	0	0	1222	16
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	2	0	0	0	6	0	0	0	0	4
Cap, veh/h	164	0	337	0	127	0	460	1313	0	199	2487	33
Arrive On Green	0.06	0.00	0.08	0.00	0.00	0.00	0.14	0.69	0.00	0.00	0.68	0.67
Sat Flow, veh/h	1433	0	1579	0	1900	0	3346	1900	0	1810	3649	48
Grp Volume(v), veh/h	18	0	301	0	0	0	321	1182	0	0	604	634
Grp Sat Flow(s),veh/h/ln	1433	0	1579	0	1900	0	1673	1900	0	1810	1805	1891
Q Serve(g_s), s	1.3	0.0	7.9	0.0	0.0	0.0	9.6	53.4	0.0	0.0	16.8	16.9
Cycle Q Clear(g_c), s	1.3	0.0	7.9	0.0	0.0	0.0	9.6	53.4	0.0	0.0	16.8	16.9
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.00	1.00		0.03
Lane Grp Cap(c), veh/h	157	0	337	0	127	0	460	1313	0	199	1230	1289
V/C Ratio(X)	0.11	0.00	0.89	0.00	0.00	0.00	0.70	0.90	0.00	0.00	0.49	0.49
Avail Cap(c_a), veh/h	157	0	337	0	127	0	1084	1475	0	199	1230	1289
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	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	46.6	0.0	40.2	0.0	0.0	0.0	43.2	13.3	0.0	0.0	8.0	8.0
Incr Delay (d2), s/veh	0.2	0.0	24.5	0.0	0.0	0.0	1.2	10.1	0.0	0.0	1.4	1.3
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	0.5	0.0	9.6	0.0	0.0	0.0	4.0	22.2	0.0	0.0	5.7	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.8	0.0	64.7	0.0	0.0	0.0	44.4	23.4	0.0	0.0	9.4	9.4
LnGrp LOS	D	A	E	A	A	A	D	C	A	A	A	A
Approach Vol, veh/h		319			0			1503			1238	
Approach Delay, s/veh		63.7			0.0			27.8			9.4	
Approach LOS		E						C			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.4	75.6		11.0	17.4	76.6		11.0				
Change Period (Y+Rc), s	* 5.4	* 5.4		4.5	* 5.4	* 5.4		4.5				
Max Green Setting (Gmax), s	* 33	* 51		6.5	* 4	* 80		6.5				
Max Q Clear Time (g_c+I1), s	11.6	18.9		0.0	0.0	55.4		9.9				
Green Ext Time (p_c), s	1.4	13.6		0.0	0.0	15.8		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		24.1
HCM 6th LOS		C

Notes

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

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: SW Boones Ferry Road & SW Ibach Street/SW Ibach Court

Movement	EB	EB	WB	NB	NB	SB	SB	SB	B21
Directions Served	L	TR	LTR	L	TR	L	T	R	T
Maximum Queue (ft)	198	219	38	194	368	67	560	210	42
Average Queue (ft)	89	97	11	112	168	7	252	61	2
95th Queue (ft)	165	177	36	198	301	40	512	186	23
Link Distance (ft)	622	622	761		2493		697		2246
Upstream Blk Time (%)							1		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)				95		105		110	
Storage Blk Time (%)				17	14		27	0	
Queuing Penalty (veh)				117	24		25	0	

Intersection: 2: SW Boones Ferry Road & SW Norwood Road

Movement	WB	SB	SB
Directions Served	LR	L	T
Maximum Queue (ft)	245	62	6
Average Queue (ft)	96	18	0
95th Queue (ft)	244	48	4
Link Distance (ft)	489		2493
Upstream Blk Time (%)	1		
Queuing Penalty (veh)	4		
Storage Bay Dist (ft)		290	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Site Access & SW Norwood Road

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	41	80
Average Queue (ft)	2	34
95th Queue (ft)	22	60
Link Distance (ft)	2644	350
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: SW 82nd Avenue & SW Norwood Road/Driveway

Movement	NB
Directions Served	LTR
Maximum Queue (ft)	41
Average Queue (ft)	18
95th Queue (ft)	40
Link Distance (ft)	494
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: SW Boones Ferry Road & Basalt Creek Parkway Extension

Movement	EB	EB	NB	NB	SB
Directions Served	L	R	L	T	TR
Maximum Queue (ft)	89	566	461	375	532
Average Queue (ft)	34	260	198	83	244
95th Queue (ft)	74	436	386	240	445
Link Distance (ft)	1043	1043		899	914
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			575		
Storage Blk Time (%)			0		
Queuing Penalty (veh)			2		

Intersection: 6: SW Boones Ferry Road & SW Day Road

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	L	TR	T	TR
Maximum Queue (ft)	72	186	224	299	654	267	276
Average Queue (ft)	12	68	89	156	139	105	122
95th Queue (ft)	41	135	200	267	452	211	240
Link Distance (ft)	720	720			930	1011	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			200	200			500
Storage Blk Time (%)			0	3	5	7	
Queuing Penalty (veh)			3	29	12	34	

Network Summary

Network wide Queuing Penalty: 249

Intersection: 1: SW Boones Ferry Road & SW Ibach Street/SW Ibach Court

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	TR	L	T	R
Maximum Queue (ft)	167	166	43	194	470	100	621	210
Average Queue (ft)	81	70	11	114	182	9	303	114
95th Queue (ft)	144	131	36	192	384	59	524	256
Link Distance (ft)	622	622	761		2493		697	
Upstream Blk Time (%)							0	
Queuing Penalty (veh)							0	
Storage Bay Dist (ft)				95		105		110
Storage Blk Time (%)				26	11		28	0
Queuing Penalty (veh)				172	20		56	1

Intersection: 2: SW Boones Ferry Road & SW Norwood Road

Movement	WB	NB	SB
Directions Served	LR	R	L
Maximum Queue (ft)	287	22	95
Average Queue (ft)	94	2	42
95th Queue (ft)	223	12	82
Link Distance (ft)	489		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		65	290
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Site Access & SW Norwood Road

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	33	50
Average Queue (ft)	5	26
95th Queue (ft)	23	49
Link Distance (ft)	2644	350
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: SW 82nd Avenue & SW Norwood Road/Driveway

Movement	EB	NB	SB
Directions Served	LTR	LTR	LT
Maximum Queue (ft)	6	55	31
Average Queue (ft)	0	15	4
95th Queue (ft)	4	41	20
Link Distance (ft)	2644	494	648
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			0
Queuing Penalty (veh)			0

Intersection: 5: SW Boones Ferry Road & Basalt Creek Parkway Extension

Movement	EB	EB	NB	NB	SB
Directions Served	L	R	L	T	TR
Maximum Queue (ft)	131	568	570	604	696
Average Queue (ft)	61	268	294	128	390
95th Queue (ft)	117	476	506	356	649
Link Distance (ft)	1043	1043		898	914
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			575		
Storage Blk Time (%)			1	0	
Queuing Penalty (veh)			6	0	

Intersection: 6: SW Boones Ferry Road & SW Day Road

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	L	TR	T	TR
Maximum Queue (ft)	57	209	224	299	689	279	311
Average Queue (ft)	11	86	110	173	176	127	156
95th Queue (ft)	37	164	214	286	519	236	275
Link Distance (ft)	723	723			930	1019	
Upstream Blk Time (%)					0		
Queuing Penalty (veh)					0		
Storage Bay Dist (ft)			200	200			500
Storage Blk Time (%)			1	3	6	10	
Queuing Penalty (veh)			6	27	17	56	

Network Summary

Network wide Queuing Penalty: 362

2026 & 2031 Mitigated Conditions

2026 Buildout Conditions - No Basalt Creek Parkway Extension

- AM Peak Hour Synchro Reports
- PM Peak Hour Synchro Reports
- AM Peak Hour Queuing Reports
- PM Peak Hour Queuing Reports

2026 Buildout Conditions – With Basalt Creek Parkway Extension

- AM Peak Hour Synchro Reports
- PM Peak Hour Synchro Reports
- AM Peak Hour Queuing Reports
- PM Peak Hour Queuing Reports

2031 Buildout Conditions - No Basalt Creek Parkway Extension

- AM Peak Hour Synchro Reports
- PM Peak Hour Synchro Reports
- AM Peak Hour Queuing Reports
- PM Peak Hour Queuing Reports

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	105	169	432	53	76	313
Future Volume (vph)	105	169	432	53	76	313
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.92		1.00	0.85	1.00	1.00
Flt Protected	0.98		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1636		1881	1495	1736	1881
Flt Permitted	0.98		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1636		1881	1495	1736	1881
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	130	209	533	65	94	386
RTOR Reduction (vph)	65	0	0	24	0	0
Lane Group Flow (vph)	274	0	533	41	94	386
Confl. Peds. (#/hr)		2				
Heavy Vehicles (%)	3%	3%	1%	8%	4%	1%
Turn Type	Prot		NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases				2		
Actuated Green, G (s)	15.8		24.3	24.3	6.2	35.5
Effective Green, g (s)	16.8		25.3	25.3	7.2	36.5
Actuated g/C Ratio	0.27		0.41	0.41	0.12	0.60
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	448		776	617	203	1120
v/s Ratio Prot	c0.17		c0.28		c0.05	0.21
v/s Ratio Perm				0.03		
v/c Ratio	0.61		0.69	0.07	0.46	0.34
Uniform Delay, d1	19.4		14.8	10.9	25.2	6.3
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5		2.5	0.0	1.7	0.2
Delay (s)	21.9		17.3	10.9	26.9	6.5
Level of Service	C		B	B	C	A
Approach Delay (s)	21.9		16.6			10.5
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	61.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	105	169	432	53	76	313
Future Volume (veh/h)	105	169	432	53	76	313
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1885	1781	1841	1885
Adj Flow Rate, veh/h	130	209	533	65	94	386
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	3	3	1	8	4	1
Cap, veh/h	180	290	709	568	184	1052
Arrive On Green	0.29	0.27	0.38	0.38	0.10	0.56
Sat Flow, veh/h	626	1007	1885	1510	1753	1885
Grp Volume(v), veh/h	340	0	533	65	94	386
Grp Sat Flow(s),veh/h/ln	1638	0	1885	1510	1753	1885
Q Serve(g_s), s	9.7	0.0	12.8	1.5	2.6	5.9
Cycle Q Clear(g_c), s	9.7	0.0	12.8	1.5	2.6	5.9
Prop In Lane	0.38	0.61		1.00	1.00	
Lane Grp Cap(c), veh/h	472	0	709	568	184	1052
V/C Ratio(X)	0.72	0.00	0.75	0.11	0.51	0.37
Avail Cap(c_a), veh/h	788	0	1560	1249	337	2067
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	16.9	0.0	14.1	10.6	22.0	6.4
Incr Delay (d2), s/veh	2.1	0.0	1.6	0.1	2.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	4.7	0.4	1.1	1.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.0	0.0	15.7	10.7	24.2	6.6
LnGrp LOS	B	A	B	B	C	A
Approach Vol, veh/h	340		598			480
Approach Delay, s/veh	19.0		15.2			10.0
Approach LOS	B		B			B

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.5	23.5			33.0	19.0
Change Period (Y+Rc), s	5.0	5.0			5.0	5.0
Max Green Setting (Gmax), s	9.0	42.0			56.0	24.0
Max Q Clear Time (g_c+I1), s	4.6	14.8			7.9	11.7
Green Ext Time (p_c), s	0.2	3.8			2.5	2.2

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

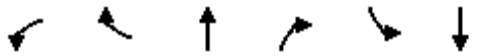
Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	69	140	557	145	165	631
Future Volume (vph)	69	140	557	145	165	631
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.91		1.00	0.85	1.00	1.00
Flt Protected	0.98		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1664		1900	1579	1805	1900
Flt Permitted	0.98		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1664		1900	1579	1805	1900
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	76	154	612	159	181	693
RTOR Reduction (vph)	90	0	0	49	0	0
Lane Group Flow (vph)	140	0	612	110	181	693
Confl. Bikes (#/hr)		1		3		
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%
Turn Type	Prot		NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases				2		
Actuated Green, G (s)	11.6		26.5	26.5	10.2	41.7
Effective Green, g (s)	12.6		27.5	27.5	11.2	42.7
Actuated g/C Ratio	0.20		0.43	0.43	0.18	0.67
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	331		825	685	319	1281
v/s Ratio Prot	c0.08		c0.32		0.10	c0.36
v/s Ratio Perm				0.07		
v/c Ratio	0.42		0.74	0.16	0.57	0.54
Uniform Delay, d1	22.2		14.9	10.9	23.8	5.3
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9		3.6	0.1	2.3	0.5
Delay (s)	23.1		18.6	11.0	26.1	5.7
Level of Service	C		B	B	C	A
Approach Delay (s)	23.1		17.0			10.0
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	69	140	557	145	165	631
Future Volume (veh/h)	69	140	557	145	165	631
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.98		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	76	154	612	159	181	693
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	0	0	0	0	0
Cap, veh/h	112	227	797	660	267	1218
Arrive On Green	0.21	0.19	0.42	0.42	0.15	0.64
Sat Flow, veh/h	533	1080	1900	1574	1810	1900
Grp Volume(v), veh/h	231	0	612	159	181	693
Grp Sat Flow(s),veh/h/ln	1621	0	1900	1574	1810	1900
Q Serve(g_s), s	7.1	0.0	14.8	3.5	5.1	11.1
Cycle Q Clear(g_c), s	7.1	0.0	14.8	3.5	5.1	11.1
Prop In Lane	0.33	0.67		1.00	1.00	
Lane Grp Cap(c), veh/h	340	0	797	660	267	1218
V/C Ratio(X)	0.68	0.00	0.77	0.24	0.68	0.57
Avail Cap(c_a), veh/h	753	0	1483	1229	370	2013
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	19.9	0.0	13.4	10.1	21.7	5.4
Incr Delay (d2), s/veh	2.4	0.0	1.6	0.2	3.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	5.4	1.0	2.2	2.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.3	0.0	15.0	10.3	24.7	5.9
LnGrp LOS	C	A	B	B	C	A
Approach Vol, veh/h	231		771			874
Approach Delay, s/veh	22.3		14.0			9.8
Approach LOS	C		B			A

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	11.9	26.6			38.5	15.3
Change Period (Y+Rc), s	5.0	5.0			5.0	5.0
Max Green Setting (Gmax), s	10.0	41.0			56.0	24.0
Max Q Clear Time (g_c+I1), s	7.1	16.8			13.1	9.1
Green Ext Time (p_c), s	0.3	4.7			5.5	1.5

Intersection Summary	
HCM 6th Ctrl Delay	13.0
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Intersection: 2: SW Boones Ferry Road & SW Norwood Road

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	R	L	T
Maximum Queue (ft)	230	245	157	100	142
Average Queue (ft)	75	121	23	43	57
95th Queue (ft)	147	213	85	85	113
Link Distance (ft)	489	1810			2530
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			85	290	
Storage Blk Time (%)		12	0		
Queuing Penalty (veh)		7	0		

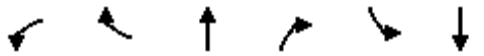
Intersection: 2: SW Boones Ferry Road & SW Norwood Road

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	R	L	T
Maximum Queue (ft)	152	324	185	174	248
Average Queue (ft)	64	165	54	81	101
95th Queue (ft)	119	277	148	141	203
Link Distance (ft)	489	1810			2530
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			85	290	
Storage Blk Time (%)		19	0		0
Queuing Penalty (veh)		28	0		0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	115	156	503	50	70	393
Future Volume (vph)	115	156	503	50	70	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.92		1.00	0.85	1.00	1.00
Flt Protected	0.98		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1644		1881	1495	1736	1881
Flt Permitted	0.98		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1644		1881	1495	1736	1881
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	142	193	621	62	86	485
RTOR Reduction (vph)	55	0	0	19	0	0
Lane Group Flow (vph)	280	0	621	43	86	485
Confl. Peds. (#/hr)		2				
Heavy Vehicles (%)	3%	3%	1%	8%	4%	1%
Turn Type	Prot		NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases				2		
Actuated Green, G (s)	16.7		28.1	28.1	6.1	39.2
Effective Green, g (s)	17.7		29.1	29.1	7.1	40.2
Actuated g/C Ratio	0.27		0.44	0.44	0.11	0.61
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	441		830	660	187	1147
v/s Ratio Prot	c0.17		c0.33		0.05	c0.26
v/s Ratio Perm				0.03		
v/c Ratio	0.64		0.75	0.07	0.46	0.42
Uniform Delay, d1	21.3		15.3	10.6	27.6	6.8
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0		3.7	0.0	1.8	0.3
Delay (s)	24.2		19.1	10.6	29.4	7.0
Level of Service	C		B	B	C	A
Approach Delay (s)	24.2		18.3			10.4
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	65.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	115	156	503	50	70	393
Future Volume (veh/h)	115	156	503	50	70	393
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1885	1781	1841	1885
Adj Flow Rate, veh/h	142	193	621	62	86	485
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	3	3	1	8	4	1
Cap, veh/h	192	261	786	629	168	1099
Arrive On Green	0.28	0.26	0.42	0.42	0.10	0.58
Sat Flow, veh/h	696	946	1885	1510	1753	1885
Grp Volume(v), veh/h	336	0	621	62	86	485
Grp Sat Flow(s),veh/h/ln	1646	0	1885	1510	1753	1885
Q Serve(g_s), s	10.6	0.0	16.3	1.4	2.7	8.2
Cycle Q Clear(g_c), s	10.6	0.0	16.3	1.4	2.7	8.2
Prop In Lane	0.42	0.57		1.00	1.00	
Lane Grp Cap(c), veh/h	455	0	786	629	168	1099
V/C Ratio(X)	0.74	0.00	0.79	0.10	0.51	0.44
Avail Cap(c_a), veh/h	723	0	1424	1140	308	1887
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	19.0	0.0	14.4	10.1	24.5	6.7
Incr Delay (d2), s/veh	2.4	0.0	1.8	0.1	2.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	6.1	0.4	1.1	2.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.4	0.0	16.3	10.2	26.9	6.9
LnGrp LOS	C	A	B	B	C	A
Approach Vol, veh/h	336		683			571
Approach Delay, s/veh	21.4		15.7			9.9
Approach LOS	C		B			A

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.5	27.7			37.2	19.7
Change Period (Y+Rc), s	5.0	5.0			5.0	5.0
Max Green Setting (Gmax), s	9.0	42.0			56.0	24.0
Max Q Clear Time (g_c+I1), s	4.7	18.3			10.2	12.6
Green Ext Time (p_c), s	0.2	4.4			3.3	2.1

Intersection Summary	
HCM 6th Ctrl Delay	14.8
HCM 6th LOS	B

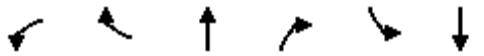
Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	75	131	523	154	152	714
Future Volume (vph)	75	131	523	154	152	714
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.91		1.00	0.85	1.00	1.00
Flt Protected	0.98		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1670		1900	1578	1805	1900
Flt Permitted	0.98		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1670		1900	1578	1805	1900
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	82	144	575	169	167	785
RTOR Reduction (vph)	77	0	0	56	0	0
Lane Group Flow (vph)	149	0	575	113	167	785
Confl. Bikes (#/hr)		1		3		
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%
Turn Type	Prot		NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases				2		
Actuated Green, G (s)	11.8		25.3	25.3	10.0	40.3
Effective Green, g (s)	12.8		26.3	26.3	11.0	41.3
Actuated g/C Ratio	0.21		0.42	0.42	0.18	0.67
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	344		804	668	319	1263
v/s Ratio Prot	c0.09		c0.30		0.09	c0.41
v/s Ratio Perm				0.07		
v/c Ratio	0.43		0.72	0.17	0.52	0.62
Uniform Delay, d1	21.5		14.8	11.1	23.2	5.9
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9		3.0	0.1	1.6	1.0
Delay (s)	22.4		17.8	11.2	24.7	6.9
Level of Service	C		B	B	C	A
Approach Delay (s)	22.4		16.3			10.0
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	62.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	75	131	523	154	152	714
Future Volume (veh/h)	75	131	523	154	152	714
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.98		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	82	144	575	169	167	785
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	0	0	0	0	0
Cap, veh/h	124	218	774	641	256	1195
Arrive On Green	0.21	0.19	0.41	0.41	0.14	0.63
Sat Flow, veh/h	588	1033	1900	1574	1810	1900
Grp Volume(v), veh/h	227	0	575	169	167	785
Grp Sat Flow(s),veh/h/ln	1628	0	1900	1574	1810	1900
Q Serve(g_s), s	6.4	0.0	12.8	3.6	4.4	13.0
Cycle Q Clear(g_c), s	6.4	0.0	12.8	3.6	4.4	13.0
Prop In Lane	0.36	0.63		1.00	1.00	
Lane Grp Cap(c), veh/h	343	0	774	641	256	1195
V/C Ratio(X)	0.66	0.00	0.74	0.26	0.65	0.66
Avail Cap(c_a), veh/h	815	0	1598	1324	399	2169
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	18.4	0.0	12.6	9.8	20.3	5.9
Incr Delay (d2), s/veh	2.2	0.0	1.4	0.2	2.8	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	4.5	1.0	1.8	3.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.6	0.0	14.0	10.0	23.1	6.5
LnGrp LOS	C	A	B	B	C	A
Approach Vol, veh/h	227		744			952
Approach Delay, s/veh	20.6		13.1			9.4
Approach LOS	C		B			A

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	11.1	24.4			35.4	14.5
Change Period (Y+Rc), s	5.0	5.0			5.0	5.0
Max Green Setting (Gmax), s	10.0	41.0			56.0	24.0
Max Q Clear Time (g_c+I1), s	6.4	14.8			15.0	8.4
Green Ext Time (p_c), s	0.4	4.5			6.6	1.5

Intersection Summary	
HCM 6th Ctrl Delay	12.1
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Intersection: 2: SW Boones Ferry Road & SW Norwood Road

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	R	L	T
Maximum Queue (ft)	190	331	183	92	208
Average Queue (ft)	74	132	27	39	77
95th Queue (ft)	145	247	96	78	154
Link Distance (ft)	489	1810			2530
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			85	290	
Storage Blk Time (%)		13	0		
Queuing Penalty (veh)		7	0		

Intersection: 2: SW Boones Ferry Road & SW Norwood Road

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	R	L	T
Maximum Queue (ft)	162	365	185	154	286
Average Queue (ft)	69	147	59	77	118
95th Queue (ft)	127	278	150	127	229
Link Distance (ft)	489	1810			2530
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			85	290	
Storage Blk Time (%)		16	0		0
Queuing Penalty (veh)		26	1		0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	105	169	432	53	76	313
Future Volume (vph)	105	169	432	53	76	313
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.92		1.00	0.85	1.00	1.00
Flt Protected	0.98		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1636		1881	1495	1736	1881
Flt Permitted	0.98		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1636		1881	1495	1736	1881
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Growth Factor (vph)	110%	110%	105%	110%	110%	105%
Adj. Flow (vph)	143	230	560	72	103	406
RTOR Reduction (vph)	64	0	0	25	0	0
Lane Group Flow (vph)	309	0	560	47	103	406
Confl. Peds. (#/hr)		2				
Heavy Vehicles (%)	3%	3%	1%	8%	4%	1%
Turn Type	Prot		NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases				2		
Actuated Green, G (s)	17.5		26.4	26.4	6.3	37.7
Effective Green, g (s)	18.5		27.4	27.4	7.3	38.7
Actuated g/C Ratio	0.28		0.42	0.42	0.11	0.59
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	464		790	628	194	1116
v/s Ratio Prot	c0.19		c0.30		c0.06	0.22
v/s Ratio Perm				0.03		
v/c Ratio	0.67		0.71	0.07	0.53	0.36
Uniform Delay, d1	20.6		15.6	11.3	27.3	6.9
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	3.6		2.9	0.1	2.8	0.2
Delay (s)	24.2		18.5	11.4	30.1	7.1
Level of Service	C		B	B	C	A
Approach Delay (s)	24.2		17.7			11.7
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	65.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	105	169	432	53	76	313
Future Volume (veh/h)	105	169	432	53	76	313
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1885	1781	1841	1885
Adj Flow Rate, veh/h	143	230	560	72	103	406
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	3	3	1	8	4	1
Cap, veh/h	189	303	723	579	180	1051
Arrive On Green	0.30	0.28	0.38	0.38	0.10	0.56
Sat Flow, veh/h	627	1008	1885	1510	1753	1885
Grp Volume(v), veh/h	374	0	560	72	103	406
Grp Sat Flow(s),veh/h/ln	1639	0	1885	1510	1753	1885
Q Serve(g_s), s	11.7	0.0	14.7	1.7	3.2	6.9
Cycle Q Clear(g_c), s	11.7	0.0	14.7	1.7	3.2	6.9
Prop In Lane	0.38	0.61		1.00	1.00	
Lane Grp Cap(c), veh/h	493	0	723	579	180	1051
V/C Ratio(X)	0.76	0.00	0.77	0.12	0.57	0.39
Avail Cap(c_a), veh/h	725	0	1434	1149	310	1901
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	18.2	0.0	15.3	11.3	24.2	7.1
Incr Delay (d2), s/veh	2.7	0.0	1.8	0.1	2.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	5.6	0.5	1.3	2.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.9	0.0	17.1	11.4	27.0	7.3
LnGrp LOS	C	A	B	B	C	A
Approach Vol, veh/h	374		632			509
Approach Delay, s/veh	20.9		16.4			11.3
Approach LOS	C		B			B

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.8	25.7			35.5	21.0
Change Period (Y+Rc), s	5.0	5.0			5.0	5.0
Max Green Setting (Gmax), s	9.0	42.0			56.0	24.0
Max Q Clear Time (g_c+I1), s	5.2	16.7			8.9	13.7
Green Ext Time (p_c), s	0.2	4.0			2.7	2.2

Intersection Summary	
HCM 6th Ctrl Delay	15.8
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	69	140	557	145	165	631
Future Volume (vph)	69	140	557	145	165	631
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.91		1.00	0.85	1.00	1.00
Flt Protected	0.98		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1664		1900	1579	1805	1900
Flt Permitted	0.98		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1664		1900	1579	1805	1900
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor (vph)	110%	110%	105%	110%	110%	105%
Adj. Flow (vph)	83	169	643	175	199	728
RTOR Reduction (vph)	90	0	0	50	0	0
Lane Group Flow (vph)	162	0	643	125	199	728
Confl. Bikes (#/hr)		1		3		
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%
Turn Type	Prot		NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases				2		
Actuated Green, G (s)	12.4		28.1	28.1	10.5	43.6
Effective Green, g (s)	13.4		29.1	29.1	11.5	44.6
Actuated g/C Ratio	0.20		0.44	0.44	0.17	0.68
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	337		837	696	314	1283
v/s Ratio Prot	c0.10		c0.34		0.11	c0.38
v/s Ratio Perm				0.08		
v/c Ratio	0.48		0.77	0.18	0.63	0.57
Uniform Delay, d1	23.2		15.6	11.2	25.3	5.6
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1		4.3	0.1	4.1	0.6
Delay (s)	24.3		19.9	11.3	29.4	6.2
Level of Service	C		B	B	C	A
Approach Delay (s)	24.3		18.0			11.2
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	66.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	69	140	557	145	165	631
Future Volume (veh/h)	69	140	557	145	165	631
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.98		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	83	169	643	175	199	728
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	0	0	0	0	0
Cap, veh/h	117	237	810	671	278	1229
Arrive On Green	0.22	0.20	0.43	0.43	0.15	0.65
Sat Flow, veh/h	532	1082	1900	1574	1810	1900
Grp Volume(v), veh/h	253	0	643	175	199	728
Grp Sat Flow(s),veh/h/ln	1620	0	1900	1574	1810	1900
Q Serve(g_s), s	8.7	0.0	17.5	4.3	6.2	13.1
Cycle Q Clear(g_c), s	8.7	0.0	17.5	4.3	6.2	13.1
Prop In Lane	0.33	0.67		1.00	1.00	
Lane Grp Cap(c), veh/h	355	0	810	671	278	1229
V/C Ratio(X)	0.71	0.00	0.79	0.26	0.72	0.59
Avail Cap(c_a), veh/h	678	0	1337	1107	333	1814
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	21.9	0.0	14.9	11.1	24.0	6.0
Incr Delay (d2), s/veh	2.7	0.0	1.8	0.2	5.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	6.6	1.3	2.9	3.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.5	0.0	16.7	11.3	29.8	6.5
LnGrp LOS	C	A	B	B	C	A
Approach Vol, veh/h	253		818			927
Approach Delay, s/veh	24.5		15.5			11.5
Approach LOS	C		B			B

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	13.2	29.5			42.6	17.1
Change Period (Y+Rc), s	5.0	5.0			5.0	5.0
Max Green Setting (Gmax), s	10.0	41.0			56.0	24.0
Max Q Clear Time (g_c+I1), s	8.2	19.5			15.1	10.7
Green Ext Time (p_c), s	0.2	4.9			5.9	1.6

Intersection Summary	
HCM 6th Ctrl Delay	14.8
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Intersection: 2: SW Boones Ferry Road & SW Norwood Road

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	R	L	T
Maximum Queue (ft)	178	294	185	108	154
Average Queue (ft)	81	136	43	49	65
95th Queue (ft)	147	244	132	93	126
Link Distance (ft)	489	1810			2530
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			85	290	
Storage Blk Time (%)		15	0		
Queuing Penalty (veh)		9	1		

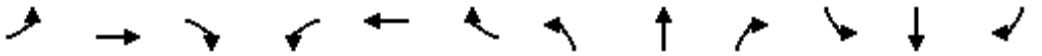
Intersection: 2: SW Boones Ferry Road & SW Norwood Road

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	R	L	T
Maximum Queue (ft)	176	363	185	229	297
Average Queue (ft)	72	169	71	100	105
95th Queue (ft)	133	297	178	182	211
Link Distance (ft)	489	1810			2530
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			85	290	
Storage Blk Time (%)		20	0		0
Queuing Penalty (veh)		33	2		0

2040 Conditions with Existing Zoning

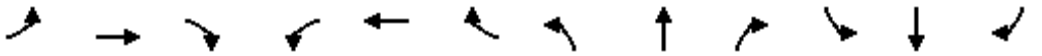
AM Peak Hour Synchro Reports

PM Peak Hour Synchro Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	1	369	3	1	20	218	723	6	8	700	105
Future Volume (vph)	224	1	369	3	1	20	218	723	6	8	700	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97			0.96		1.00	1.00		1.00	1.00	0.93
Flpb, ped/bikes	0.98	1.00			1.00		1.00	1.00		0.98	1.00	1.00
Frt	1.00	0.85			0.89		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1765	1565			1613		1805	1824		1770	1900	1507
Flt Permitted	0.74	1.00			0.80		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1376	1565			1290		1805	1824		1770	1900	1507
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	243	1	401	3	1	22	237	786	7	9	761	114
RTOR Reduction (vph)	0	214	0	0	17	0	0	0	0	0	0	58
Lane Group Flow (vph)	243	188	0	0	9	0	237	793	0	9	761	56
Confl. Peds. (#/hr)	12		4	4		12	4		19	19		19
Confl. Bikes (#/hr)			1						2			2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	18.0	18.0			18.0		12.3	51.3		0.7	39.7	39.7
Effective Green, g (s)	18.5	18.5			18.5		12.3	52.3		0.7	40.7	40.7
Actuated g/C Ratio	0.22	0.22			0.22		0.15	0.63		0.01	0.49	0.49
Clearance Time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.3	2.3			2.5		2.3	4.3		2.3	4.3	4.3
Lane Grp Cap (vph)	304	346			285		265	1142		14	926	734
v/s Ratio Prot		0.12					c0.13	0.43		0.01	c0.40	
v/s Ratio Perm	c0.18				0.01							0.04
v/c Ratio	0.80	0.54			0.03		0.89	0.69		0.64	0.82	0.08
Uniform Delay, d1	30.7	28.8			25.5		35.0	10.3		41.3	18.3	11.4
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	13.1	1.2			0.0		29.1	2.1		61.6	6.4	0.1
Delay (s)	43.8	30.0			25.5		64.0	12.4		102.8	24.7	11.5
Level of Service	D	C			C		E	B		F	C	B
Approach Delay (s)		35.2			25.5			24.3			23.8	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	83.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	1	369	3	1	20	218	723	6	8	700	105
Future Volume (veh/h)	224	1	369	3	1	20	218	723	6	8	700	105
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	1.00		0.98	1.00		0.96	1.00		0.96
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	1900	1900	1900	1900	1900	1900	1841	1900	1900	1900	1900
Adj Flow Rate, veh/h	243	1	314	3	1	22	237	786	7	9	761	27
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, %	0	0	0	0	0	0	0	4	0	0	0	0
Cap, veh/h	291	1	412	60	38	284	253	1061	9	16	858	696
Arrive On Green	0.27	0.27	0.26	0.26	0.27	0.26	0.14	0.58	0.57	0.01	0.45	0.45
Sat Flow, veh/h	1393	5	1536	49	143	1057	1810	1821	16	1810	1900	1542
Grp Volume(v), veh/h	243	0	315	26	0	0	237	0	793	9	761	27
Grp Sat Flow(s),veh/h/ln	1393	0	1541	1249	0	0	1810	0	1837	1810	1900	1542
Q Serve(g_s), s	6.8	0.0	16.1	0.1	0.0	0.0	11.1	0.0	27.2	0.4	31.4	0.8
Cycle Q Clear(g_c), s	23.0	0.0	16.1	16.2	0.0	0.0	11.1	0.0	27.2	0.4	31.4	0.8
Prop In Lane	1.00		1.00	0.12		0.85	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	291	0	414	375	0	0	253	0	1070	16	858	696
V/C Ratio(X)	0.84	0.00	0.76	0.07	0.00	0.00	0.94	0.00	0.74	0.55	0.89	0.04
Avail Cap(c_a), veh/h	291	0	414	375	0	0	253	0	1093	84	954	774
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	0.0	29.1	23.6	0.0	0.0	36.5	0.0	13.1	42.3	21.5	13.1
Incr Delay (d2), s/veh	18.1	0.0	7.6	0.1	0.0	0.0	38.9	0.0	3.0	16.6	10.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	0.0	6.7	0.4	0.0	0.0	7.5	0.0	10.4	0.3	15.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.5	0.0	36.7	23.7	0.0	0.0	75.4	0.0	16.1	58.9	31.6	13.2
LnGrp LOS	D	A	D	C	A	A	E	A	B	E	C	B
Approach Vol, veh/h		558			26			1030			797	
Approach Delay, s/veh		44.0			23.7			29.8			31.3	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	53.9		27.0	16.0	42.7		27.0				
Change Period (Y+Rc), s	4.0	5.0		4.5	4.0	5.0		4.5				
Max Green Setting (Gmax), s	4.0	50.0		22.5	12.0	42.0		22.5				
Max Q Clear Time (g_c+I1), s	2.4	29.2		25.0	13.1	33.4		18.2				
Green Ext Time (p_c), s	0.0	7.8		0.0	0.0	4.3		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		33.5
HCM 6th LOS		C

Notes

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

Intersection	
Int Delay, s/veh	23.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	154	206	538	120	129	421
Future Vol, veh/h	154	206	538	120	129	421
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	65	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	0	0	0	0	0
Mvmt Flow	169	226	591	132	142	463

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1338	591	0	0	723	0
Stage 1	591	-	-	-	-	-
Stage 2	747	-	-	-	-	-
Critical Hdwy	6.42	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	~ 169	511	-	-	889	-
Stage 1	553	-	-	-	-	-
Stage 2	468	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 142	511	-	-	889	-
Mov Cap-2 Maneuver	272	-	-	-	-	-
Stage 1	553	-	-	-	-	-
Stage 2	393	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	99.5	0	2.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	371	889	-
HCM Lane V/C Ratio	-	-	1.066	0.159	-
HCM Control Delay (s)	-	-	99.5	9.8	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	13.8	0.6	-

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

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	125	124	22	259	101	18
Future Vol, veh/h	125	124	22	259	101	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	137	136	24	285	111	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	273	0	538	205
Stage 1	-	-	-	-	205	-
Stage 2	-	-	-	-	333	-
Critical Hdwy	-	-	4.12	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1290	-	508	841
Stage 1	-	-	-	-	834	-
Stage 2	-	-	-	-	731	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1290	-	497	841
Mov Cap-2 Maneuver	-	-	-	-	497	-
Stage 1	-	-	-	-	834	-
Stage 2	-	-	-	-	715	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	14
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	530	-	-	1290	-
HCM Lane V/C Ratio	0.247	-	-	0.019	-
HCM Control Delay (s)	14	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1	-	-	0.1	-

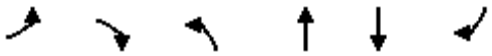
Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↕	↱
Traffic Vol, veh/h	232	0	12	0	0	0	32	3	0	0	0	181
Future Vol, veh/h	232	0	12	0	0	0	32	3	0	0	0	181
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	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	1	0	0	0	0	0	5	0	0	0	0	0
Mvmt Flow	255	0	13	0	0	0	35	3	0	0	0	199

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	13	0	0	518	518	7	519	524	-
Stage 1	-	-	-	-	-	-	517	517	-	1	1	-
Stage 2	-	-	-	-	-	-	1	1	-	518	523	-
Critical Hdwy	4.11	-	-	4.1	-	-	7.15	6.5	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.2	-	-	3.545	4	3.3	3.5	4	-
Pot Cap-1 Maneuver	1628	-	-	1619	-	-	463	465	1081	471	461	0
Stage 1	-	-	-	-	-	-	536	537	-	1027	899	0
Stage 2	-	-	-	-	-	-	1014	899	-	544	534	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1628	-	-	1619	-	-	407	392	1081	411	388	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	407	392	-	411	388	-
Stage 1	-	-	-	-	-	-	451	452	-	865	899	-
Stage 2	-	-	-	-	-	-	1014	899	-	455	450	-

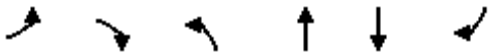
Approach	EB	WB	NB	SB
HCM Control Delay, s	7.2	0	14.8	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	406	1628	-	-	1619	-	-	-	-
HCM Lane V/C Ratio	0.095	0.157	-	-	-	-	-	-	-
HCM Control Delay (s)	14.8	7.6	0	-	0	-	-	0	0
HCM Lane LOS	B	A	A	-	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0.6	-	-	0	-	-	-	-



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	73	744	645	639	483	163
Future Volume (vph)	73	744	645	639	483	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1805	1615	1703	1900	3439	
Flt Permitted	0.95	1.00	0.26	1.00	1.00	
Satd. Flow (perm)	1805	1615	459	1900	3439	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	80	818	709	702	531	179
RTOR Reduction (vph)	0	48	0	0	32	0
Lane Group Flow (vph)	80	770	709	702	678	0
Heavy Vehicles (%)	0%	0%	6%	0%	0%	4%
Turn Type	Prot	pt+ov	pm+pt	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases			6			
Actuated Green, G (s)	9.4	53.4	75.7	75.7	31.7	
Effective Green, g (s)	9.9	49.0	77.1	77.1	33.1	
Actuated g/C Ratio	0.10	0.52	0.81	0.81	0.35	
Clearance Time (s)	4.5		5.4	5.4	5.4	
Vehicle Extension (s)	2.5		2.3	4.4	4.4	
Lane Grp Cap (vph)	188	833	896	1542	1198	
v/s Ratio Prot	0.04	c0.48	0.33	0.37	0.20	
v/s Ratio Perm			c0.31			
v/c Ratio	0.43	0.92	0.79	0.46	0.57	
Uniform Delay, d1	39.9	21.3	12.5	2.7	25.1	
Progression Factor	1.00	1.00	0.90	0.97	1.00	
Incremental Delay, d2	1.1	15.7	4.3	0.9	1.9	
Delay (s)	41.0	37.0	15.5	3.5	27.1	
Level of Service	D	D	B	A	C	
Approach Delay (s)	37.3			9.5	27.1	
Approach LOS	D			A	C	

Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	73	744	645	639	483	163
Future Volume (veh/h)	73	744	645	639	483	163
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1811	1900	1900	1841
Adj Flow Rate, veh/h	80	488	709	702	531	174
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	6	0	0	4
Cap, veh/h	141	977	1030	1592	688	225
Arrive On Green	0.08	0.08	0.54	0.84	0.26	0.24
Sat Flow, veh/h	1810	1610	1725	1900	2770	873
Grp Volume(v), veh/h	80	488	709	702	358	347
Grp Sat Flow(s),veh/h/ln	1810	1610	1725	1900	1805	1743
Q Serve(g_s), s	4.1	0.0	21.1	9.0	17.4	17.6
Cycle Q Clear(g_c), s	4.1	0.0	21.1	9.0	17.4	17.6
Prop In Lane	1.00	1.00	1.00			0.50
Lane Grp Cap(c), veh/h	141	977	1030	1592	464	448
V/C Ratio(X)	0.57	0.50	0.69	0.44	0.77	0.77
Avail Cap(c_a), veh/h	229	1055	1030	1592	532	514
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.91	0.91	1.00	1.00
Uniform Delay (d), s/veh	42.2	10.5	13.4	2.0	32.7	33.1
Incr Delay (d2), s/veh	2.6	0.3	1.6	0.8	11.7	12.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	5.3	9.8	1.9	9.0	8.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	44.9	10.8	15.0	2.8	44.3	45.4
LnGrp LOS	D	B	B	A	D	D
Approach Vol, veh/h	568			1411	705	
Approach Delay, s/veh	15.6			8.9	44.9	
Approach LOS	B			A	D	

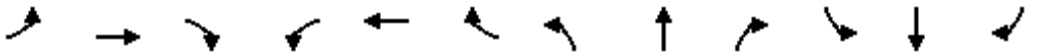
Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	55.1	28.4				83.6	11.4
Change Period (Y+Rc), s	* 5.4	* 5.4				* 5.4	4.5
Max Green Setting (Gmax), s	* 42	* 27				* 74	11.5
Max Q Clear Time (g_c+I1), s	23.1	19.6				11.0	6.1
Green Ext Time (p_c), s	1.5	3.4				10.8	0.9

Intersection Summary	
HCM 6th Ctrl Delay	19.8
HCM 6th LOS	B

Notes

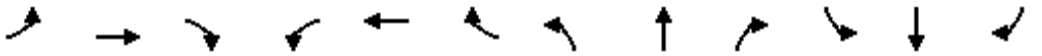
User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	0	334	0	0	0	348	1259	0	0	1206	21
Future Volume (vph)	25	0	334	0	0	0	348	1259	0	0	1206	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.3	4.7				4.9	4.0			4.0	
Lane Util. Factor		1.00	1.00				*0.85	0.95			0.95	
Frpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Flpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	1.00			1.00	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1803	1583				1447	3610			3598	
Flt Permitted		0.89	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1687	1583				1447	3610			3598	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	27	0	367	0	0	0	382	1384	0	0	1325	23
RTOR Reduction (vph)	0	0	58	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	27	309	0	0	0	382	1384	0	0	1347	0
Confl. Peds. (#/hr)	1					1						
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	6%	0%	0%	0%	0%	4%
Turn Type	Perm	NA	pm+ov				Prot	NA		Prot	NA	
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Actuated Green, G (s)		4.3	32.1				27.8	80.8			47.6	
Effective Green, g (s)		4.5	33.5				28.3	82.2			49.0	
Actuated g/C Ratio		0.05	0.35				0.30	0.87			0.52	
Clearance Time (s)		4.5	5.4				5.4	5.4			5.4	
Vehicle Extension (s)		2.5	2.3				2.3	4.4			4.4	
Lane Grp Cap (vph)		79	558				431	3123			1855	
v/s Ratio Prot			c0.17				c0.26	0.38			c0.37	
v/s Ratio Perm		0.02	0.03									
v/c Ratio		0.34	0.55				0.89	0.44			0.73	
Uniform Delay, d1		43.8	24.7				31.8	1.4			17.8	
Progression Factor		1.00	1.00				1.00	1.00			1.10	
Incremental Delay, d2		1.9	0.8				18.9	0.5			1.7	
Delay (s)		45.7	25.6				50.7	1.9			21.2	
Level of Service		D	C				D	A			C	
Approach Delay (s)		27.0			0.0			12.4			21.2	
Approach LOS		C			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	13.2
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	0	334	0	0	0	348	1259	0	0	1206	21
Future Volume (veh/h)	25	0	334	0	0	0	348	1259	0	0	1206	21
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	1900	1900	1870	1900	1900	1900	1811	1900	1900	1900	1900	1841
Adj Flow Rate, veh/h	27	0	345	0	0	0	382	1384	0	0	1325	23
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	2	0	0	0	6	0	0	0	0	4
Cap, veh/h	192	0	592	0	160	0	419	1926	0	446	1795	31
Arrive On Green	0.08	0.00	0.09	0.00	0.00	0.00	0.29	0.53	0.00	0.00	0.99	0.96
Sat Flow, veh/h	1435	0	1580	0	1900	0	1466	3705	0	1810	3631	63
Grp Volume(v), veh/h	27	0	345	0	0	0	382	1384	0	0	658	690
Grp Sat Flow(s),veh/h/ln	1435	0	1580	0	1900	0	1466	1805	0	1810	1805	1889
Q Serve(g_s), s	1.7	0.0	8.2	0.0	0.0	0.0	23.9	27.6	0.0	0.0	1.4	1.5
Cycle Q Clear(g_c), s	1.7	0.0	8.2	0.0	0.0	0.0	23.9	27.6	0.0	0.0	1.4	1.5
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.00	1.00		0.03
Lane Grp Cap(c), veh/h	189	0	592	0	160	0	419	1926	0	446	893	934
V/C Ratio(X)	0.14	0.00	0.58	0.00	0.00	0.00	0.91	0.72	0.00	0.00	0.74	0.74
Avail Cap(c_a), veh/h	189	0	592	0	160	0	480	2679	0	446	893	934
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.62	0.62
Uniform Delay (d), s/veh	41.0	0.0	23.8	0.0	0.0	0.0	32.8	16.8	0.0	0.0	0.3	0.3
Incr Delay (d2), s/veh	0.3	0.0	1.3	0.0	0.0	0.0	19.4	2.3	0.0	0.0	3.4	3.3
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	0.6	0.0	6.0	0.0	0.0	0.0	10.4	11.0	0.0	0.0	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.2	0.0	25.1	0.0	0.0	0.0	52.2	19.1	0.0	0.0	3.7	3.6
LnGrp LOS	D	A	C	A	A	A	D	B	A	A	A	A
Approach Vol, veh/h		372			0			1766			1348	
Approach Delay, s/veh		26.2			0.0			26.3			3.6	
Approach LOS		C						C			A	

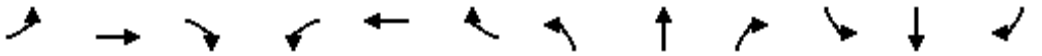
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	32.0	51.0		12.0	28.3	54.7		12.0				
Change Period (Y+Rc), s	* 5.4	* 5.4		4.5	* 5.4	* 5.4		4.5				
Max Green Setting (Gmax), s	* 31	* 42		7.5	* 4	* 69		7.5				
Max Q Clear Time (g_c+I1), s	25.9	3.5		0.0	0.0	29.6		10.2				
Green Ext Time (p_c), s	0.7	16.7		0.0	0.0	19.7		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	17.5
HCM 6th LOS	B

Notes

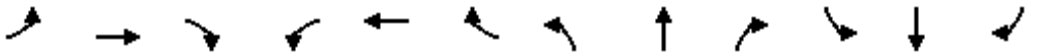
User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	4	207	1	1	15	231	695	4	6	865	247
Future Volume (vph)	184	4	207	1	1	15	231	695	4	6	865	247
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97			0.96		1.00	1.00		1.00	1.00	0.92
Flpb, ped/bikes	0.97	1.00			1.00		1.00	1.00		0.98	1.00	1.00
Frt	1.00	0.85			0.88		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1755	1566			1596		1805	1825		1760	1900	1489
Flt Permitted	0.75	1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1378	1566			1579		1805	1825		1760	1900	1489
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	200	4	225	1	1	16	251	755	4	7	940	268
RTOR Reduction (vph)	0	185	0	0	13	0	0	0	0	0	0	54
Lane Group Flow (vph)	200	44	0	0	5	0	251	759	0	7	940	214
Confl. Peds. (#/hr)	12		4	4		12	4		19	19		19
Confl. Bikes (#/hr)			1						2			2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	18.2	18.2			18.2		15.6	70.7		0.7	55.8	55.8
Effective Green, g (s)	18.2	18.2			18.2		15.6	70.7		0.7	55.8	55.8
Actuated g/C Ratio	0.18	0.18			0.18		0.15	0.69		0.01	0.54	0.54
Clearance Time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.3	2.3			2.5		2.3	4.3		2.3	4.3	4.3
Lane Grp Cap (vph)	243	276			278		273	1251		11	1028	805
v/s Ratio Prot		0.03					c0.14	0.42		0.00	c0.49	
v/s Ratio Perm	c0.15				0.00							0.14
v/c Ratio	0.82	0.16			0.02		0.92	0.61		0.64	0.91	0.27
Uniform Delay, d1	40.9	36.0			35.1		43.1	8.7		51.1	21.5	12.7
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	19.1	0.2			0.0		33.3	1.0		70.2	12.5	0.3
Delay (s)	60.0	36.1			35.1		76.4	9.8		121.2	34.0	13.0
Level of Service	E	D			D		E	A		F	C	B
Approach Delay (s)		47.3			35.1			26.3			29.8	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	103.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	4	207	1	1	15	231	695	4	6	865	247
Future Volume (veh/h)	184	4	207	1	1	15	231	695	4	6	865	247
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.94	0.98		0.96	1.00		0.97	1.00		0.96
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	1900	1900	1900	1900	1900	1900	1841	1900	1900	1900	1900
Adj Flow Rate, veh/h	200	4	138	1	1	16	251	755	4	7	940	181
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, %	0	0	0	0	0	0	0	4	0	0	0	0
Cap, veh/h	302	7	245	42	26	231	283	1265	7	13	1030	839
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.69	0.69	0.01	0.54	0.54
Sat Flow, veh/h	1369	43	1483	19	156	1400	1810	1829	10	1810	1900	1548
Grp Volume(v), veh/h	200	0	142	18	0	0	251	0	759	7	940	181
Grp Sat Flow(s),veh/h/ln	1369	0	1526	1575	0	0	1810	0	1839	1810	1900	1548
Q Serve(g_s), s	12.9	0.0	8.5	0.0	0.0	0.0	13.5	0.0	21.5	0.4	44.4	6.0
Cycle Q Clear(g_c), s	13.8	0.0	8.5	1.0	0.0	0.0	13.5	0.0	21.5	0.4	44.4	6.0
Prop In Lane	1.00		0.97	0.06		0.89	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	302	0	252	298	0	0	283	0	1271	13	1030	839
V/C Ratio(X)	0.66	0.00	0.56	0.06	0.00	0.00	0.89	0.00	0.60	0.55	0.91	0.22
Avail Cap(c_a), veh/h	318	0	270	316	0	0	292	0	1299	73	1113	906
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.2	0.0	38.1	34.9	0.0	0.0	40.9	0.0	8.0	49.0	20.5	11.8
Incr Delay (d2), s/veh	4.0	0.0	1.6	0.1	0.0	0.0	25.1	0.0	0.9	20.4	11.3	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	5.0	0.0	3.3	0.4	0.0	0.0	7.8	0.0	7.3	0.2	20.9	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.2	0.0	39.7	35.0	0.0	0.0	66.1	0.0	9.0	69.4	31.8	12.0
LnGrp LOS	D	A	D	C	A	A	E	A	A	E	C	B
Approach Vol, veh/h		342			18			1010			1128	
Approach Delay, s/veh		42.3			35.0			23.2			28.9	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	73.5		20.9	19.5	58.7		20.9				
Change Period (Y+Rc), s	4.0	5.0		4.5	4.0	5.0		4.5				
Max Green Setting (Gmax), s	4.0	70.0		17.5	16.0	58.0		17.5				
Max Q Clear Time (g_c+I1), s	2.4	23.5		15.8	15.5	46.4		3.0				
Green Ext Time (p_c), s	0.0	9.4		0.3	0.1	7.3		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		28.5	
HCM 6th LOS		C	

Notes

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

Intersection	
Int Delay, s/veh	10

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	83	162	560	161	168	764
Future Vol, veh/h	83	162	560	161	168	764
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	65	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	0	0	0	0	0
Mvmt Flow	91	178	615	177	185	840

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1825	615	0	0	792	0
Stage 1	615	-	-	-	-	-
Stage 2	1210	-	-	-	-	-
Critical Hdwy	6.42	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	~ 85	495	-	-	838	-
Stage 1	539	-	-	-	-	-
Stage 2	282	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 66	495	-	-	838	-
Mov Cap-2 Maneuver	166	-	-	-	-	-
Stage 1	539	-	-	-	-	-
Stage 2	220	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	70.2	0	1.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	296	838	-
HCM Lane V/C Ratio	-	-	0.91	0.22	-
HCM Control Delay (s)	-	-	70.2	10.5	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	8.5	0.8	-

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

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	297	32	6	210	35	6
Future Vol, veh/h	297	32	6	210	35	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	326	35	7	231	38	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	361	0	589	344
Stage 1	-	-	-	-	344	-
Stage 2	-	-	-	-	245	-
Critical Hdwy	-	-	4.12	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1198	-	474	703
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	800	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1198	-	471	703
Mov Cap-2 Maneuver	-	-	-	-	471	-
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	794	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	13
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	495	-	-	1198	-
HCM Lane V/C Ratio	0.091	-	-	0.006	-
HCM Control Delay (s)	13	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

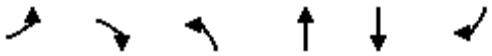
Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	163	0	32	0	0	0	28	4	0	0	5	199
Future Vol, veh/h	163	0	32	0	0	0	28	4	0	0	5	199
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	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	1	0	0	0	0	0	5	0	0	0	0	0
Mvmt Flow	179	0	35	0	0	0	31	4	0	0	5	219

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	35	0	0	380	377	18	379	394	-
Stage 1	-	-	-	-	-	-	376	376	-	1	1	-
Stage 2	-	-	-	-	-	-	4	1	-	378	393	-
Critical Hdwy	4.11	-	-	4.1	-	-	7.15	6.5	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.2	-	-	3.545	4	3.3	3.5	4	-
Pot Cap-1 Maneuver	1628	-	-	1589	-	-	572	558	1066	582	546	0
Stage 1	-	-	-	-	-	-	639	620	-	1027	899	0
Stage 2	-	-	-	-	-	-	1011	899	-	648	609	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1628	-	-	1589	-	-	518	495	1066	528	484	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	518	495	-	528	484	-
Stage 1	-	-	-	-	-	-	567	550	-	911	899	-
Stage 2	-	-	-	-	-	-	1005	899	-	570	540	-

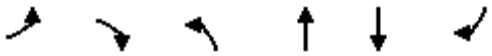
Approach	EB	WB	NB	SB
HCM Control Delay, s	6.3	0	12.5	12.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	515	1628	-	-	1589	-	-	484	-
HCM Lane V/C Ratio	0.068	0.11	-	-	-	-	-	0.011	-
HCM Control Delay (s)	12.5	7.5	0	-	0	-	-	12.5	0
HCM Lane LOS	B	A	A	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	0.4	-	-	0	-	-	0	-



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	103	690	645	671	693	190
Future Volume (vph)	103	690	645	671	693	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1805	1615	1703	1900	3464	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1805	1615	1703	1900	3464	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	113	758	709	737	762	209
RTOR Reduction (vph)	0	20	0	0	23	0
Lane Group Flow (vph)	113	738	709	737	948	0
Heavy Vehicles (%)	0%	0%	6%	0%	0%	4%
Turn Type	Prot	pm+ov	Prot	NA	NA	
Protected Phases	8	1	1	6	2	
Permitted Phases		8				
Actuated Green, G (s)	8.3	55.0	46.7	86.8	34.7	
Effective Green, g (s)	8.8	56.0	48.1	88.2	36.1	
Actuated g/C Ratio	0.08	0.53	0.46	0.84	0.34	
Clearance Time (s)	4.5	5.4	5.4	5.4	5.4	
Vehicle Extension (s)	2.5	2.3	2.3	4.4	4.4	
Lane Grp Cap (vph)	151	861	780	1596	1190	
v/s Ratio Prot	0.06	c0.39	c0.42	0.39	c0.27	
v/s Ratio Perm		0.07				
v/c Ratio	0.75	0.86	0.91	0.46	0.80	
Uniform Delay, d1	47.0	21.1	26.4	2.2	31.1	
Progression Factor	1.00	1.00	0.96	0.65	1.00	
Incremental Delay, d2	17.3	8.3	13.3	0.9	5.6	
Delay (s)	64.4	29.3	38.6	2.3	36.7	
Level of Service	E	C	D	A	D	
Approach Delay (s)	33.9			20.1	36.7	
Approach LOS	C			C	D	

Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	103	690	645	671	693	190
Future Volume (veh/h)	103	690	645	671	693	190
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1811	1900	1900	1841
Adj Flow Rate, veh/h	113	428	709	737	762	204
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	6	0	0	4
Cap, veh/h	155	785	708	1592	1096	293
Arrive On Green	0.09	0.09	0.82	1.00	0.39	0.38
Sat Flow, veh/h	1810	1610	1725	1900	2911	754
Grp Volume(v), veh/h	113	428	709	737	489	477
Grp Sat Flow(s),veh/h/ln	1810	1610	1725	1900	1805	1764
Q Serve(g_s), s	6.4	9.0	43.1	0.0	23.8	23.9
Cycle Q Clear(g_c), s	6.4	9.0	43.1	0.0	23.8	23.9
Prop In Lane	1.00	1.00	1.00			0.43
Lane Grp Cap(c), veh/h	155	785	708	1592	703	687
V/C Ratio(X)	0.73	0.54	1.00	0.46	0.70	0.70
Avail Cap(c_a), veh/h	155	785	838	1592	703	687
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.90	0.90	1.00	1.00
Uniform Delay (d), s/veh	46.8	18.8	9.4	0.0	26.8	27.1
Incr Delay (d2), s/veh	15.1	0.6	27.7	0.9	5.6	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	7.2	9.0	0.4	11.1	11.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	61.9	19.4	37.1	0.9	32.5	32.9
LnGrp LOS	E	B	F	A	C	C
Approach Vol, veh/h	541			1446	966	
Approach Delay, s/veh	28.3			18.6	32.7	
Approach LOS	C			B	C	

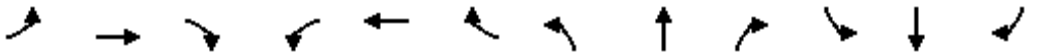
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	49.2	42.8			92.0	13.0
Change Period (Y+Rc), s	* 5.4	* 5.4			* 5.4	4.5
Max Green Setting (Gmax), s	* 50	* 32			* 87	8.5
Max Q Clear Time (g_c+I1), s	45.1	25.9			2.0	11.0
Green Ext Time (p_c), s	0.9	3.8			12.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	25.0
HCM 6th LOS	C

Notes

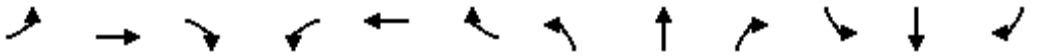
User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	376	0	0	0	374	1297	0	0	1364	19
Future Volume (vph)	19	0	376	0	0	0	374	1297	0	0	1364	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0				4.0	4.0			4.0	
Lane Util. Factor		1.00	1.00				*0.85	0.95			0.95	
Frpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Flpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	1.00			1.00	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1803	1583				1447	3610			3601	
Flt Permitted		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1808	1583				1447	3610			3601	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	21	0	413	0	0	0	411	1425	0	0	1499	21
RTOR Reduction (vph)	0	0	51	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	21	362	0	0	0	411	1425	0	0	1519	0
Confl. Peds. (#/hr)	1					1						
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	6%	0%	0%	0%	0%	4%
Turn Type	Perm	NA	pm+ov				Prot	NA		Prot	NA	
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Actuated Green, G (s)		3.7	35.6				31.9	91.4			54.1	
Effective Green, g (s)		4.2	38.4				33.3	92.8			55.5	
Actuated g/C Ratio		0.04	0.37				0.32	0.88			0.53	
Clearance Time (s)		4.5	5.4				5.4	5.4			5.4	
Vehicle Extension (s)		2.5	2.3				2.3	4.4			4.4	
Lane Grp Cap (vph)		72	578				458	3190			1903	
v/s Ratio Prot			c0.20				c0.28	0.39			c0.42	
v/s Ratio Perm		0.01	0.03									
v/c Ratio		0.29	0.63				0.90	0.45			0.80	
Uniform Delay, d1		49.0	27.4				34.2	1.2			20.2	
Progression Factor		1.00	1.00				1.00	1.00			0.89	
Incremental Delay, d2		1.6	1.7				19.6	0.5			2.2	
Delay (s)		50.6	29.1				53.8	1.6			20.1	
Level of Service		D	C				D	A			C	
Approach Delay (s)		30.1			0.0			13.3			20.1	
Approach LOS		C			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	0	376	0	0	0	374	1297	0	0	1364	19
Future Volume (veh/h)	19	0	376	0	0	0	374	1297	0	0	1364	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		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	1900	1900	1870	1900	1900	1900	1811	1900	1900	1900	1900	1841
Adj Flow Rate, veh/h	21	0	391	0	0	0	411	1425	0	0	1499	21
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	2	0	0	0	6	0	0	0	0	4
Cap, veh/h	159	0	602	0	119	0	453	1961	0	473	1874	26
Arrive On Green	0.06	0.00	0.07	0.00	0.00	0.00	0.31	0.54	0.00	0.00	1.00	1.00
Sat Flow, veh/h	1433	0	1578	0	1900	0	1466	3705	0	1810	3645	51
Grp Volume(v), veh/h	21	0	391	0	0	0	411	1425	0	0	742	778
Grp Sat Flow(s),veh/h/ln	1433	0	1578	0	1900	0	1466	1805	0	1810	1805	1891
Q Serve(g_s), s	1.5	0.0	7.5	0.0	0.0	0.0	28.3	31.3	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	7.5	0.0	0.0	0.0	28.3	31.3	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.00	1.00		0.03
Lane Grp Cap(c), veh/h	152	0	602	0	119	0	453	1961	0	473	928	972
V/C Ratio(X)	0.14	0.00	0.65	0.00	0.00	0.00	0.91	0.73	0.00	0.00	0.80	0.80
Avail Cap(c_a), veh/h	152	0	602	0	119	0	503	2816	0	473	928	972
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.50	0.50
Uniform Delay (d), s/veh	47.0	0.0	26.8	0.0	0.0	0.0	34.9	18.1	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	2.2	0.0	0.0	0.0	18.6	2.4	0.0	0.0	3.7	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	8.0	0.0	0.0	0.0	12.1	12.7	0.0	0.0	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.3	0.0	29.0	0.0	0.0	0.0	53.4	20.5	0.0	0.0	3.7	3.6
LnGrp LOS	D	A	C	A	A	A	D	C	A	A	A	A
Approach Vol, veh/h		412			0			1836			1520	
Approach Delay, s/veh		30.0			0.0			27.9			3.6	
Approach LOS		C						C			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	36.4	58.0		10.6	33.4	61.0		10.6				
Change Period (Y+Rc), s	* 5.4	* 5.4		4.5	* 5.4	* 5.4		4.5				
Max Green Setting (Gmax), s	* 35	* 49		6.1	* 4	* 81		6.1				
Max Q Clear Time (g_c+I1), s	30.3	2.0		0.0	0.0	33.3		9.5				
Green Ext Time (p_c), s	0.7	22.2		0.0	0.0	22.4		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		18.3	
HCM 6th LOS		B	

Notes

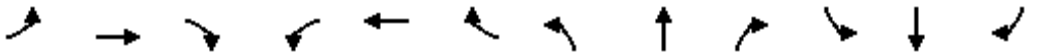
User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

2040 Conditions with Proposed Zoning

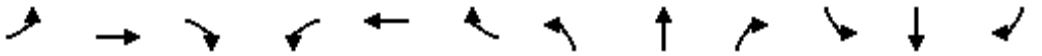
AM Peak Hour Synchro Reports

PM Peak Hour Synchro Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	1	367	3	1	20	218	711	6	8	663	105
Future Volume (vph)	224	1	367	3	1	20	218	711	6	8	663	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97			0.96		1.00	1.00		1.00	1.00	0.93
Flpb, ped/bikes	0.98	1.00			1.00		1.00	1.00		0.98	1.00	1.00
Frt	1.00	0.85			0.89		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1766	1566			1614		1805	1824		1771	1900	1508
Flt Permitted	0.74	1.00			0.82		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1376	1566			1327		1805	1824		1771	1900	1508
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	243	1	399	3	1	22	237	773	7	9	721	114
RTOR Reduction (vph)	0	223	0	0	17	0	0	0	0	0	0	60
Lane Group Flow (vph)	243	177	0	0	9	0	237	780	0	9	721	54
Confl. Peds. (#/hr)	12		4	4		12	4		19	19		19
Confl. Bikes (#/hr)			1						2			2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	17.8	17.8			17.8		12.4	49.5		0.7	37.8	37.8
Effective Green, g (s)	18.3	18.3			18.3		12.4	50.5		0.7	38.8	38.8
Actuated g/C Ratio	0.22	0.22			0.22		0.15	0.62		0.01	0.48	0.48
Clearance Time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.3	2.3			2.5		2.3	4.3		2.3	4.3	4.3
Lane Grp Cap (vph)	308	351			297		274	1130		15	904	717
v/s Ratio Prot		0.11					c0.13	0.43		0.01	c0.38	
v/s Ratio Perm	c0.18				0.01							0.04
v/c Ratio	0.79	0.51			0.03		0.86	0.69		0.60	0.80	0.08
Uniform Delay, d1	29.8	27.6			24.7		33.7	10.3		40.3	18.0	11.6
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.0	0.7			0.0		23.2	2.0		40.9	5.4	0.1
Delay (s)	41.7	28.3			24.7		56.9	12.3		81.2	23.4	11.7
Level of Service	D	C			C		E	B		F	C	B
Approach Delay (s)		33.4			24.7			22.7			22.5	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	81.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	1	367	3	1	20	218	711	6	8	663	105
Future Volume (veh/h)	224	1	367	3	1	20	218	711	6	8	663	105
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	1.00		0.98	1.00		0.96	1.00		0.96
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	1900	1900	1900	1900	1900	1900	1841	1900	1900	1900	1900
Adj Flow Rate, veh/h	243	1	312	3	1	22	237	773	7	9	721	27
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, %	0	0	0	0	0	0	0	4	0	0	0	0
Cap, veh/h	308	1	423	63	40	301	260	1042	9	16	832	675
Arrive On Green	0.28	0.28	0.27	0.27	0.28	0.27	0.14	0.57	0.56	0.01	0.44	0.44
Sat Flow, veh/h	1393	5	1537	54	145	1095	1810	1821	16	1810	1900	1541
Grp Volume(v), veh/h	243	0	313	26	0	0	237	0	780	9	721	27
Grp Sat Flow(s),veh/h/ln	1393	0	1542	1294	0	0	1810	0	1837	1810	1900	1541
Q Serve(g_s), s	7.4	0.0	15.5	0.1	0.0	0.0	10.8	0.0	26.4	0.4	28.7	0.8
Cycle Q Clear(g_c), s	23.0	0.0	15.5	15.6	0.0	0.0	10.8	0.0	26.4	0.4	28.7	0.8
Prop In Lane	1.00		1.00	0.12		0.85	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	308	0	424	396	0	0	260	0	1052	16	832	675
V/C Ratio(X)	0.79	0.00	0.74	0.07	0.00	0.00	0.91	0.00	0.74	0.55	0.87	0.04
Avail Cap(c_a), veh/h	308	0	424	396	0	0	260	0	1120	87	977	792
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.8	0.0	27.8	22.6	0.0	0.0	35.3	0.0	13.3	41.3	21.3	13.4
Incr Delay (d2), s/veh	12.3	0.0	6.2	0.1	0.0	0.0	33.3	0.0	2.9	16.5	8.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	0.0	6.3	0.4	0.0	0.0	7.0	0.0	10.1	0.3	13.4	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.0	0.0	34.0	22.7	0.0	0.0	68.6	0.0	16.2	57.8	29.4	13.5
LnGrp LOS	D	A	C	C	A	A	E	A	B	E	C	B
Approach Vol, veh/h		556			26			1017			757	
Approach Delay, s/veh		39.3			22.7			28.4			29.2	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	51.9		27.0	16.0	40.6		27.0				
Change Period (Y+Rc), s	4.0	5.0		4.5	4.0	5.0		4.5				
Max Green Setting (Gmax), s	4.0	50.0		22.5	12.0	42.0		22.5				
Max Q Clear Time (g_c+I1), s	2.4	28.4		25.0	12.8	30.7		17.6				
Green Ext Time (p_c), s	0.0	7.7		0.0	0.0	4.9		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		31.1	
HCM 6th LOS		C	

Notes

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

Intersection	
Int Delay, s/veh	13.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	137	192	538	60	87	421
Future Vol, veh/h	137	192	538	60	87	421
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	65	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	0	0	0	0	0
Mvmt Flow	151	211	591	66	96	463

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1246	591	0	0	657	0
Stage 1	591	-	-	-	-	-
Stage 2	655	-	-	-	-	-
Critical Hdwy	6.42	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	192	511	-	-	940	-
Stage 1	553	-	-	-	-	-
Stage 2	517	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	172	511	-	-	940	-
Mov Cap-2 Maneuver	308	-	-	-	-	-
Stage 1	553	-	-	-	-	-
Stage 2	464	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	56.1	0	1.6
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	401	940	-
HCM Lane V/C Ratio	-	-	0.902	0.102	-
HCM Control Delay (s)	-	-	56.1	9.3	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	9.4	0.3	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	125	22	4	259	70	12
Future Vol, veh/h	125	22	4	259	70	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	137	24	4	285	77	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	161	0	442	149
Stage 1	-	-	-	-	149	-
Stage 2	-	-	-	-	293	-
Critical Hdwy	-	-	4.12	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1418	-	577	903
Stage 1	-	-	-	-	884	-
Stage 2	-	-	-	-	762	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1418	-	575	903
Mov Cap-2 Maneuver	-	-	-	-	575	-
Stage 1	-	-	-	-	884	-
Stage 2	-	-	-	-	760	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	607	-	-	1418	-
HCM Lane V/C Ratio	0.148	-	-	0.003	-
HCM Control Delay (s)	12	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0	-

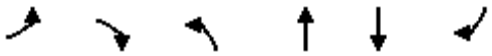
Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↕	↱
Traffic Vol, veh/h	226	0	12	0	0	0	32	3	0	0	0	163
Future Vol, veh/h	226	0	12	0	0	0	32	3	0	0	0	163
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	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	1	0	0	0	0	0	5	0	0	0	0	0
Mvmt Flow	248	0	13	0	0	0	35	3	0	0	0	179

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	13	0	0	504	504	7	505	510	-
Stage 1	-	-	-	-	-	-	503	503	-	1	1	-
Stage 2	-	-	-	-	-	-	1	1	-	504	509	-
Critical Hdwy	4.11	-	-	4.1	-	-	7.15	6.5	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.2	-	-	3.545	4	3.3	3.5	4	-
Pot Cap-1 Maneuver	1628	-	-	1619	-	-	473	473	1081	481	469	0
Stage 1	-	-	-	-	-	-	545	545	-	1027	899	0
Stage 2	-	-	-	-	-	-	1014	899	-	554	541	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1628	-	-	1619	-	-	417	400	1081	421	397	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	417	400	-	421	397	-
Stage 1	-	-	-	-	-	-	461	461	-	869	899	-
Stage 2	-	-	-	-	-	-	1014	899	-	465	458	-

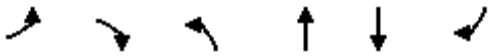
Approach	EB	WB	NB	SB
HCM Control Delay, s	7.2	0	14.6	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	415	1628	-	-	1619	-	-	-	-
HCM Lane V/C Ratio	0.093	0.153	-	-	-	-	-	-	-
HCM Control Delay (s)	14.6	7.6	0	-	0	-	-	0	0
HCM Lane LOS	B	A	A	-	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0.5	-	-	0	-	-	-	-



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	57	744	645	595	470	159
Future Volume (vph)	57	744	645	595	470	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1805	1615	1703	1900	3438	
Flt Permitted	0.95	1.00	0.27	1.00	1.00	
Satd. Flow (perm)	1805	1615	480	1900	3438	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	63	818	709	654	516	175
RTOR Reduction (vph)	0	52	0	0	32	0
Lane Group Flow (vph)	63	766	709	654	659	0
Heavy Vehicles (%)	0%	0%	6%	0%	0%	4%
Turn Type	Prot	pt+ov	pm+pt	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases			6			
Actuated Green, G (s)	9.2	53.2	75.9	75.9	31.9	
Effective Green, g (s)	9.7	48.8	77.3	77.3	33.3	
Actuated g/C Ratio	0.10	0.51	0.81	0.81	0.35	
Clearance Time (s)	4.5		5.4	5.4	5.4	
Vehicle Extension (s)	2.5		2.3	4.4	4.4	
Lane Grp Cap (vph)	184	829	905	1546	1205	
v/s Ratio Prot	0.03	c0.47	0.33	0.34	0.19	
v/s Ratio Perm			c0.31			
v/c Ratio	0.34	0.92	0.78	0.42	0.55	
Uniform Delay, d1	39.7	21.4	11.9	2.5	24.8	
Progression Factor	1.00	1.00	0.90	0.97	1.00	
Incremental Delay, d2	0.8	15.8	4.0	0.8	1.8	
Delay (s)	40.5	37.1	14.7	3.2	26.6	
Level of Service	D	D	B	A	C	
Approach Delay (s)	37.4			9.2	26.6	
Approach LOS	D			A	C	

Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	57	744	645	595	470	159
Future Volume (veh/h)	57	744	645	595	470	159
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1811	1900	1900	1841
Adj Flow Rate, veh/h	63	488	709	654	516	170
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	6	0	0	4
Cap, veh/h	126	984	1053	1608	676	222
Arrive On Green	0.07	0.07	0.55	0.85	0.25	0.24
Sat Flow, veh/h	1810	1610	1725	1900	2766	876
Grp Volume(v), veh/h	63	488	709	654	348	338
Grp Sat Flow(s),veh/h/ln	1810	1610	1725	1900	1805	1742
Q Serve(g_s), s	3.2	0.0	20.2	7.7	16.9	17.1
Cycle Q Clear(g_c), s	3.2	0.0	20.2	7.7	16.9	17.1
Prop In Lane	1.00	1.00	1.00			0.50
Lane Grp Cap(c), veh/h	126	984	1053	1608	457	441
V/C Ratio(X)	0.50	0.50	0.67	0.41	0.76	0.77
Avail Cap(c_a), veh/h	229	1075	1053	1608	532	514
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.92	0.92	1.00	1.00
Uniform Delay (d), s/veh	42.6	10.3	12.6	1.7	32.8	33.2
Incr Delay (d2), s/veh	2.3	0.3	1.4	0.7	11.4	12.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	5.2	9.3	1.5	8.7	8.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	44.9	10.6	14.0	2.4	44.2	45.3
LnGrp LOS	D	B	B	A	D	D
Approach Vol, veh/h	551			1363	686	
Approach Delay, s/veh	14.5			8.4	44.7	
Approach LOS	B			A	D	

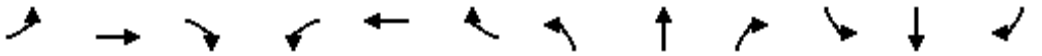
Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	56.3	28.0				84.4	10.6
Change Period (Y+Rc), s	* 5.4	* 5.4				* 5.4	4.5
Max Green Setting (Gmax), s	* 42	* 27				* 74	11.5
Max Q Clear Time (g_c+I1), s	22.2	19.1				9.7	5.2
Green Ext Time (p_c), s	1.6	3.5				9.6	0.9

Intersection Summary	
HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B

Notes

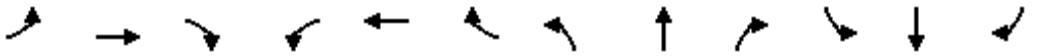
User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	0	334	0	0	0	348	1217	0	0	1193	21
Future Volume (vph)	23	0	334	0	0	0	348	1217	0	0	1193	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.3	4.7				4.9	4.0			4.0	
Lane Util. Factor		1.00	1.00				*0.85	0.95			0.95	
Frpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Flpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	1.00			1.00	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1803	1583				1447	3610			3598	
Flt Permitted		0.89	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1687	1583				1447	3610			3598	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	25	0	367	0	0	0	382	1337	0	0	1311	23
RTOR Reduction (vph)	0	0	58	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	25	309	0	0	0	382	1337	0	0	1333	0
Confl. Peds. (#/hr)	1					1						
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	6%	0%	0%	0%	0%	4%
Turn Type	Perm	NA	pm+ov				Prot	NA		Prot	NA	
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Actuated Green, G (s)		4.3	32.1				27.8	80.8			47.6	
Effective Green, g (s)		4.5	33.5				28.3	82.2			49.0	
Actuated g/C Ratio		0.05	0.35				0.30	0.87			0.52	
Clearance Time (s)		4.5	5.4				5.4	5.4			5.4	
Vehicle Extension (s)		2.5	2.3				2.3	4.4			4.4	
Lane Grp Cap (vph)		79	558				431	3123			1855	
v/s Ratio Prot			c0.17				c0.26	0.37			c0.37	
v/s Ratio Perm		0.01	0.03									
v/c Ratio		0.32	0.55				0.89	0.43			0.72	
Uniform Delay, d1		43.8	24.7				31.8	1.4			17.7	
Progression Factor		1.00	1.00				1.00	1.00			1.11	
Incremental Delay, d2		1.7	0.8				18.9	0.4			1.7	
Delay (s)		45.4	25.6				50.7	1.8			21.3	
Level of Service		D	C				D	A			C	
Approach Delay (s)		26.8			0.0			12.7			21.3	
Approach LOS		C			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	13.2
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	0	334	0	0	0	348	1217	0	0	1193	21
Future Volume (veh/h)	23	0	334	0	0	0	348	1217	0	0	1193	21
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	1900	1900	1870	1900	1900	1900	1811	1900	1900	1900	1900	1841
Adj Flow Rate, veh/h	25	0	345	0	0	0	382	1337	0	0	1311	23
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	2	0	0	0	6	0	0	0	0	4
Cap, veh/h	192	0	592	0	160	0	419	1872	0	473	1795	31
Arrive On Green	0.08	0.00	0.09	0.00	0.00	0.00	0.29	0.52	0.00	0.00	0.99	0.96
Sat Flow, veh/h	1435	0	1580	0	1900	0	1466	3705	0	1810	3630	64
Grp Volume(v), veh/h	25	0	345	0	0	0	382	1337	0	0	652	682
Grp Sat Flow(s),veh/h/ln	1435	0	1580	0	1900	0	1466	1805	0	1810	1805	1889
Q Serve(g_s), s	1.6	0.0	8.2	0.0	0.0	0.0	23.9	26.9	0.0	0.0	1.4	1.5
Cycle Q Clear(g_c), s	1.6	0.0	8.2	0.0	0.0	0.0	23.9	26.9	0.0	0.0	1.4	1.5
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.00	1.00		0.03
Lane Grp Cap(c), veh/h	189	0	592	0	160	0	419	1872	0	473	893	934
V/C Ratio(X)	0.13	0.00	0.58	0.00	0.00	0.00	0.91	0.71	0.00	0.00	0.73	0.73
Avail Cap(c_a), veh/h	189	0	592	0	160	0	480	2679	0	473	893	934
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.62	0.62
Uniform Delay (d), s/veh	40.9	0.0	23.8	0.0	0.0	0.0	32.8	17.5	0.0	0.0	0.3	0.3
Incr Delay (d2), s/veh	0.2	0.0	1.3	0.0	0.0	0.0	19.4	2.4	0.0	0.0	3.3	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	6.0	0.0	0.0	0.0	10.4	10.8	0.0	0.0	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.2	0.0	25.1	0.0	0.0	0.0	52.2	19.9	0.0	0.0	3.6	3.5
LnGrp LOS	D	A	C	A	A	A	D	B	A	A	A	A
Approach Vol, veh/h		370			0			1719			1334	
Approach Delay, s/veh		26.2			0.0			27.0			3.5	
Approach LOS		C						C			A	

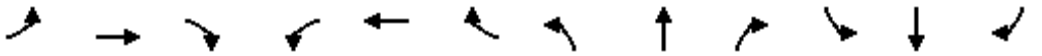
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	32.0	51.0		12.0	29.7	53.3		12.0				
Change Period (Y+Rc), s	* 5.4	* 5.4		4.5	* 5.4	* 5.4		4.5				
Max Green Setting (Gmax), s	* 31	* 42		7.5	* 4	* 69		7.5				
Max Q Clear Time (g_c+I1), s	25.9	3.5		0.0	0.0	28.9		10.2				
Green Ext Time (p_c), s	0.7	16.4		0.0	0.0	18.9		0.0				

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

Notes

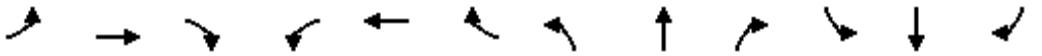
User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	4	208	1	1	15	231	696	4	6	880	247
Future Volume (vph)	184	4	208	1	1	15	231	696	4	6	880	247
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97			0.96		1.00	1.00		1.00	1.00	0.92
Flpb, ped/bikes	0.97	1.00			1.00		1.00	1.00		0.97	1.00	1.00
Frt	1.00	0.85			0.88		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1755	1566			1596		1805	1825		1760	1900	1489
Flt Permitted	0.75	1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1378	1566			1579		1805	1825		1760	1900	1489
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	200	4	226	1	1	16	251	757	4	7	957	268
RTOR Reduction (vph)	0	186	0	0	13	0	0	0	0	0	0	53
Lane Group Flow (vph)	200	44	0	0	5	0	251	761	0	7	957	215
Confl. Peds. (#/hr)	12		4	4		12	4		19	19		19
Confl. Bikes (#/hr)			1						2			2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	18.2	18.2			18.2		15.6	71.7		0.7	56.8	56.8
Effective Green, g (s)	18.2	18.2			18.2		15.6	71.7		0.7	56.8	56.8
Actuated g/C Ratio	0.17	0.17			0.17		0.15	0.69		0.01	0.55	0.55
Clearance Time (s)	4.5	4.5			4.5		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.3	2.3			2.5		2.3	4.3		2.3	4.3	4.3
Lane Grp Cap (vph)	240	273			276		270	1256		11	1036	812
v/s Ratio Prot		0.03					c0.14	0.42		0.00	c0.50	
v/s Ratio Perm	c0.15				0.00							0.14
v/c Ratio	0.83	0.16			0.02		0.93	0.61		0.64	0.92	0.27
Uniform Delay, d1	41.5	36.5			35.5		43.7	8.7		51.6	21.7	12.6
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	20.7	0.2			0.0		35.8	1.0		70.2	13.5	0.3
Delay (s)	62.2	36.6			35.6		79.5	9.7		121.7	35.2	12.8
Level of Service	E	D			D		E	A		F	D	B
Approach Delay (s)		48.5			35.6			27.0			30.8	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	104.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	4	208	1	1	15	231	696	4	6	880	247
Future Volume (veh/h)	184	4	208	1	1	15	231	696	4	6	880	247
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.94	0.98		0.96	1.00		0.97	1.00		0.96
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	1900	1900	1900	1900	1900	1900	1841	1900	1900	1900	1900
Adj Flow Rate, veh/h	200	4	139	1	1	16	251	757	4	7	957	181
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, %	0	0	0	0	0	0	0	4	0	0	0	0
Cap, veh/h	300	7	243	41	26	230	282	1270	7	13	1036	844
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.69	0.69	0.01	0.55	0.55
Sat Flow, veh/h	1369	43	1483	19	156	1400	1810	1829	10	1810	1900	1548
Grp Volume(v), veh/h	200	0	143	18	0	0	251	0	761	7	957	181
Grp Sat Flow(s),veh/h/ln	1369	0	1525	1575	0	0	1810	0	1839	1810	1900	1548
Q Serve(g_s), s	13.1	0.0	8.7	0.0	0.0	0.0	13.6	0.0	21.7	0.4	46.3	6.0
Cycle Q Clear(g_c), s	14.0	0.0	8.7	1.0	0.0	0.0	13.6	0.0	21.7	0.4	46.3	6.0
Prop In Lane	1.00		0.97	0.06		0.89	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	300	0	250	296	0	0	282	0	1277	13	1036	844
V/C Ratio(X)	0.67	0.00	0.57	0.06	0.00	0.00	0.89	0.00	0.60	0.55	0.92	0.21
Avail Cap(c_a), veh/h	314	0	266	312	0	0	288	0	1282	72	1097	894
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.8	0.0	38.7	35.5	0.0	0.0	41.5	0.0	8.0	49.7	20.9	11.8
Incr Delay (d2), s/veh	4.3	0.0	1.9	0.1	0.0	0.0	26.0	0.0	1.0	20.4	12.7	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	5.1	0.0	3.4	0.4	0.0	0.0	8.0	0.0	7.4	0.2	22.1	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.1	0.0	40.6	35.5	0.0	0.0	67.5	0.0	9.0	70.1	33.7	12.0
LnGrp LOS	D	A	D	D	A	A	E	A	A	E	C	B
Approach Vol, veh/h		343			18			1012			1145	
Approach Delay, s/veh		43.2			35.5			23.5			30.5	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	74.7		21.0	19.7	59.8		21.0				
Change Period (Y+Rc), s	4.0	5.0		4.5	4.0	5.0		4.5				
Max Green Setting (Gmax), s	4.0	70.0		17.5	16.0	58.0		17.5				
Max Q Clear Time (g_c+I1), s	2.4	23.7		16.0	15.6	48.3		3.0				
Green Ext Time (p_c), s	0.0	9.5		0.2	0.0	6.4		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		29.4	
HCM 6th LOS		C	

Notes

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

Intersection	
Int Delay, s/veh	12.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	89	164	560	186	186	764
Future Vol, veh/h	89	164	560	186	186	764
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	65	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	0	0	0	0	0
Mvmt Flow	98	180	615	204	204	840

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1863	615	0	0	819	0
Stage 1	615	-	-	-	-	-
Stage 2	1248	-	-	-	-	-
Critical Hdwy	6.42	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	~ 80	495	-	-	818	-
Stage 1	539	-	-	-	-	-
Stage 2	271	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 60	495	-	-	818	-
Mov Cap-2 Maneuver	156	-	-	-	-	-
Stage 1	539	-	-	-	-	-
Stage 2	204	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	91	0	2.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	281	818	-
HCM Lane V/C Ratio	-	-	0.989	0.25	-
HCM Control Delay (s)	-	-	91	10.9	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	10	1	-

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

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	297	75	13	210	43	8
Future Vol, veh/h	297	75	13	210	43	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	326	82	14	231	47	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	408	0	626	367
Stage 1	-	-	-	-	367	-
Stage 2	-	-	-	-	259	-
Critical Hdwy	-	-	4.12	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1151	-	451	683
Stage 1	-	-	-	-	705	-
Stage 2	-	-	-	-	789	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1151	-	445	683
Mov Cap-2 Maneuver	-	-	-	-	445	-
Stage 1	-	-	-	-	705	-
Stage 2	-	-	-	-	778	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	13.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	471	-	-	1151	-
HCM Lane V/C Ratio	0.119	-	-	0.012	-
HCM Control Delay (s)	13.7	-	-	8.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

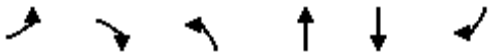
Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	165	0	32	0	0	0	28	4	0	0	5	206
Future Vol, veh/h	165	0	32	0	0	0	28	4	0	0	5	206
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	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	1	0	0	0	0	0	5	0	0	0	0	0
Mvmt Flow	181	0	35	0	0	0	31	4	0	0	5	226

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	35	0	0	384	381	18	383	398	-
Stage 1	-	-	-	-	-	-	380	380	-	1	1	-
Stage 2	-	-	-	-	-	-	4	1	-	382	397	-
Critical Hdwy	4.11	-	-	4.1	-	-	7.15	6.5	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.2	-	-	3.545	4	3.3	3.5	4	-
Pot Cap-1 Maneuver	1628	-	-	1589	-	-	569	555	1066	579	543	0
Stage 1	-	-	-	-	-	-	636	617	-	1027	899	0
Stage 2	-	-	-	-	-	-	1011	899	-	645	607	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1628	-	-	1589	-	-	515	492	1066	525	481	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	515	492	-	525	481	-
Stage 1	-	-	-	-	-	-	563	547	-	910	899	-
Stage 2	-	-	-	-	-	-	1005	899	-	567	538	-

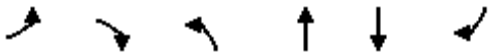
Approach	EB	WB	NB	SB
HCM Control Delay, s	6.3	0	12.5	12.6
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	512	1628	-	-	1589	-	-	481	-
HCM Lane V/C Ratio	0.069	0.111	-	-	-	-	-	0.011	-
HCM Control Delay (s)	12.5	7.5	0	-	0	-	-	12.6	0
HCM Lane LOS	B	A	A	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	0.4	-	-	0	-	-	0	-



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	109	690	645	690	697	192
Future Volume (vph)	109	690	645	690	697	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1805	1615	1703	1900	3463	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1805	1615	1703	1900	3463	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	120	758	709	758	766	211
RTOR Reduction (vph)	0	19	0	0	23	0
Lane Group Flow (vph)	120	739	709	758	954	0
Heavy Vehicles (%)	0%	0%	6%	0%	0%	4%
Turn Type	Prot	pm+ov	Prot	NA	NA	
Protected Phases	8	1	1	6	2	
Permitted Phases		8				
Actuated Green, G (s)	8.4	55.1	46.7	86.7	34.6	
Effective Green, g (s)	8.9	56.1	48.1	88.1	36.0	
Actuated g/C Ratio	0.08	0.53	0.46	0.84	0.34	
Clearance Time (s)	4.5	5.4	5.4	5.4	5.4	
Vehicle Extension (s)	2.5	2.3	2.3	4.4	4.4	
Lane Grp Cap (vph)	152	862	780	1594	1187	
v/s Ratio Prot	0.07	c0.38	c0.42	0.40	c0.28	
v/s Ratio Perm		0.07				
v/c Ratio	0.79	0.86	0.91	0.48	0.80	
Uniform Delay, d1	47.1	21.0	26.4	2.3	31.3	
Progression Factor	1.00	1.00	0.96	0.65	1.00	
Incremental Delay, d2	22.5	8.2	13.3	0.9	5.8	
Delay (s)	69.7	29.3	38.6	2.4	37.1	
Level of Service	E	C	D	A	D	
Approach Delay (s)	34.8			19.9	37.1	
Approach LOS	C			B	D	

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	109	690	645	690	697	192
Future Volume (veh/h)	109	690	645	690	697	192
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1811	1900	1900	1841
Adj Flow Rate, veh/h	120	428	709	758	766	206
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	6	0	0	4
Cap, veh/h	155	785	708	1592	1095	294
Arrive On Green	0.09	0.09	0.82	1.00	0.39	0.38
Sat Flow, veh/h	1810	1610	1725	1900	2907	756
Grp Volume(v), veh/h	120	428	709	758	492	480
Grp Sat Flow(s),veh/h/ln	1810	1610	1725	1900	1805	1764
Q Serve(g_s), s	6.8	9.0	43.1	0.0	24.0	24.1
Cycle Q Clear(g_c), s	6.8	9.0	43.1	0.0	24.0	24.1
Prop In Lane	1.00	1.00	1.00			0.43
Lane Grp Cap(c), veh/h	155	785	708	1592	703	687
V/C Ratio(X)	0.77	0.54	1.00	0.48	0.70	0.70
Avail Cap(c_a), veh/h	155	785	838	1592	703	687
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.90	0.90	1.00	1.00
Uniform Delay (d), s/veh	47.0	18.8	9.4	0.0	26.9	27.2
Incr Delay (d2), s/veh	20.5	0.6	27.7	0.9	5.7	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	7.2	9.0	0.4	11.2	11.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	67.5	19.4	37.1	0.9	32.6	33.0
LnGrp LOS	E	B	F	A	C	C
Approach Vol, veh/h	548			1467	972	
Approach Delay, s/veh	29.9			18.4	32.8	
Approach LOS	C			B	C	

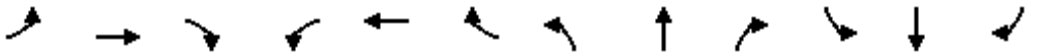
Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	49.2	42.8				92.0	13.0
Change Period (Y+Rc), s	* 5.4	* 5.4				* 5.4	4.5
Max Green Setting (Gmax), s	* 50	* 32				* 87	8.5
Max Q Clear Time (g_c+I1), s	45.1	26.1				2.0	11.0
Green Ext Time (p_c), s	0.9	3.7				12.6	0.0

Intersection Summary	
HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

Notes

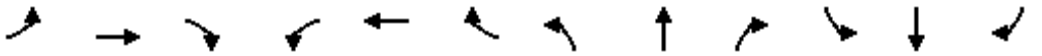
User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	0	376	0	0	0	374	1315	0	0	1368	19
Future Volume (vph)	20	0	376	0	0	0	374	1315	0	0	1368	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0				4.0	4.0			4.0	
Lane Util. Factor		1.00	1.00				*0.85	0.95			0.95	
Frpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Flpb, ped/bikes		1.00	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	1.00			1.00	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1802	1583				1447	3610			3601	
Flt Permitted		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1807	1583				1447	3610			3601	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	22	0	413	0	0	0	411	1445	0	0	1503	21
RTOR Reduction (vph)	0	0	51	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	22	362	0	0	0	411	1445	0	0	1523	0
Confl. Peds. (#/hr)	1					1						
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	6%	0%	0%	0%	0%	4%
Turn Type	Perm	NA	pm+ov				Prot	NA		Prot	NA	
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Actuated Green, G (s)		3.7	35.6				31.9	91.4			54.1	
Effective Green, g (s)		4.2	38.4				33.3	92.8			55.5	
Actuated g/C Ratio		0.04	0.37				0.32	0.88			0.53	
Clearance Time (s)		4.5	5.4				5.4	5.4			5.4	
Vehicle Extension (s)		2.5	2.3				2.3	4.4			4.4	
Lane Grp Cap (vph)		72	578				458	3190			1903	
v/s Ratio Prot			c0.20				c0.28	0.40			c0.42	
v/s Ratio Perm		0.01	0.03									
v/c Ratio		0.31	0.63				0.90	0.45			0.80	
Uniform Delay, d1		49.0	27.4				34.2	1.2			20.2	
Progression Factor		1.00	1.00				1.00	1.00			0.89	
Incremental Delay, d2		1.8	1.7				19.6	0.5			2.2	
Delay (s)		50.7	29.1				53.8	1.6			20.1	
Level of Service		D	C				D	A			C	
Approach Delay (s)		30.2			0.0			13.2			20.1	
Approach LOS		C			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	0	376	0	0	0	374	1315	0	0	1368	19
Future Volume (veh/h)	20	0	376	0	0	0	374	1315	0	0	1368	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		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	1900	1900	1870	1900	1900	1900	1811	1900	1900	1900	1900	1841
Adj Flow Rate, veh/h	22	0	391	0	0	0	411	1445	0	0	1503	21
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	2	0	0	0	6	0	0	0	0	4
Cap, veh/h	158	0	602	0	119	0	453	1985	0	461	1874	26
Arrive On Green	0.06	0.00	0.07	0.00	0.00	0.00	0.31	0.55	0.00	0.00	1.00	1.00
Sat Flow, veh/h	1428	0	1578	0	1900	0	1466	3705	0	1810	3645	51
Grp Volume(v), veh/h	22	0	391	0	0	0	411	1445	0	0	744	780
Grp Sat Flow(s),veh/h/ln	1428	0	1578	0	1900	0	1466	1805	0	1810	1805	1891
Q Serve(g_s), s	1.5	0.0	7.5	0.0	0.0	0.0	28.3	31.5	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	7.5	0.0	0.0	0.0	28.3	31.5	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.00	1.00		0.03
Lane Grp Cap(c), veh/h	152	0	602	0	119	0	453	1985	0	461	928	972
V/C Ratio(X)	0.15	0.00	0.65	0.00	0.00	0.00	0.91	0.73	0.00	0.00	0.80	0.80
Avail Cap(c_a), veh/h	152	0	602	0	119	0	503	2816	0	461	928	972
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.49	0.49
Uniform Delay (d), s/veh	47.1	0.0	26.8	0.0	0.0	0.0	34.9	17.7	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	2.2	0.0	0.0	0.0	18.6	2.4	0.0	0.0	3.7	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	8.0	0.0	0.0	0.0	12.1	12.7	0.0	0.0	0.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.4	0.0	29.0	0.0	0.0	0.0	53.4	20.1	0.0	0.0	3.7	3.5
LnGrp LOS	D	A	C	A	A	A	D	C	A	A	A	A
Approach Vol, veh/h		413			0			1856			1524	
Approach Delay, s/veh		30.0			0.0			27.5			3.6	
Approach LOS		C						C			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	36.4	58.0		10.6	32.7	61.7		10.6				
Change Period (Y+Rc), s	* 5.4	* 5.4		4.5	* 5.4	* 5.4		4.5				
Max Green Setting (Gmax), s	* 35	* 49		6.1	* 4	* 81		6.1				
Max Q Clear Time (g_c+I1), s	30.3	2.0		0.0	0.0	33.5		9.5				
Green Ext Time (p_c), s	0.7	22.3		0.0	0.0	22.8		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		18.2	
HCM 6th LOS		B	

Notes

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

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

2040 Mitigated Conditions

2040 Conditions with Existing Zoning

- AM Peak Hour Synchro Reports
- PM Peak Hour Synchro Reports

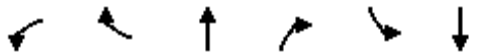
2040 Conditions with Proposed Zoning

- AM Peak Hour Synchro Reports
- PM Peak Hour Synchro Reports

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	154	206	538	120	129	421
Future Volume (vph)	154	206	538	120	129	421
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.92		1.00	0.85	1.00	1.00
Flt Protected	0.98		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1681		1900	1578	1805	1900
Flt Permitted	0.98		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1681		1900	1578	1805	1900
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	169	226	591	132	142	463
RTOR Reduction (vph)	54	0	0	36	0	0
Lane Group Flow (vph)	341	0	591	96	142	463
Confl. Bikes (#/hr)		1		3		
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%
Turn Type	Prot		NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases				2		
Actuated Green, G (s)	18.7		28.9	28.9	8.9	42.8
Effective Green, g (s)	19.7		29.9	29.9	9.9	43.8
Actuated g/C Ratio	0.28		0.42	0.42	0.14	0.61
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	463		794	659	249	1163
v/s Ratio Prot	c0.20		c0.31		c0.08	0.24
v/s Ratio Perm				0.06		
v/c Ratio	0.74		0.74	0.15	0.57	0.40
Uniform Delay, d1	23.5		17.6	12.9	28.8	7.1
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	6.0		3.8	0.1	3.1	0.2
Delay (s)	29.6		21.4	13.0	31.9	7.3
Level of Service	C		C	B	C	A
Approach Delay (s)	29.6		19.8			13.1
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	71.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	154	206	538	120	129	421
Future Volume (veh/h)	154	206	538	120	129	421
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.98		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	169	226	591	132	142	463
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	0	0	0	0	0
Cap, veh/h	203	272	751	622	210	1098
Arrive On Green	0.29	0.27	0.40	0.40	0.12	0.58
Sat Flow, veh/h	701	937	1900	1573	1810	1900
Grp Volume(v), veh/h	396	0	591	132	142	463
Grp Sat Flow(s),veh/h/ln	1642	0	1900	1573	1810	1900
Q Serve(g_s), s	13.7	0.0	16.5	3.3	4.5	8.2
Cycle Q Clear(g_c), s	13.7	0.0	16.5	3.3	4.5	8.2
Prop In Lane	0.43	0.57		1.00	1.00	
Lane Grp Cap(c), veh/h	476	0	751	622	210	1098
V/C Ratio(X)	0.83	0.00	0.79	0.21	0.68	0.42
Avail Cap(c_a), veh/h	679	0	1352	1119	299	1792
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	20.4	0.0	16.0	12.1	25.6	7.1
Incr Delay (d2), s/veh	6.0	0.0	1.9	0.2	3.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	6.4	1.0	2.0	2.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.3	0.0	17.9	12.2	29.4	7.4
LnGrp LOS	C	A	B	B	C	A
Approach Vol, veh/h	396		723			605
Approach Delay, s/veh	26.3		16.9			12.5
Approach LOS	C		B			B

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	11.0	27.9			38.9	21.5
Change Period (Y+Rc), s	5.0	5.0			5.0	5.0
Max Green Setting (Gmax), s	9.0	42.0			56.0	24.0
Max Q Clear Time (g_c+I1), s	6.5	18.5			10.2	15.7
Green Ext Time (p_c), s	0.1	4.4			3.1	0.9

Intersection Summary	
HCM 6th Ctrl Delay	17.5
HCM 6th LOS	B

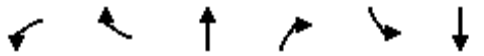
Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	83	162	560	161	168	764
Future Volume (vph)	83	162	560	161	168	764
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.91		1.00	0.85	1.00	1.00
Flt Protected	0.98		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1666		1900	1579	1805	1900
Flt Permitted	0.98		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1666		1900	1579	1805	1900
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	91	178	615	177	185	840
RTOR Reduction (vph)	85	0	0	44	0	0
Lane Group Flow (vph)	184	0	615	133	185	840
Confl. Bikes (#/hr)		1		3		
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%
Turn Type	Prot		NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases				2		
Actuated Green, G (s)	12.9		27.3	27.3	10.2	42.5
Effective Green, g (s)	13.9		28.3	28.3	11.2	43.5
Actuated g/C Ratio	0.21		0.43	0.43	0.17	0.67
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	354		822	683	309	1263
v/s Ratio Prot	c0.11		c0.32		0.10	c0.44
v/s Ratio Perm				0.08		
v/c Ratio	0.52		0.75	0.19	0.60	0.67
Uniform Delay, d1	22.8		15.6	11.5	25.0	6.6
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3		3.8	0.1	3.1	1.3
Delay (s)	24.1		19.3	11.6	28.1	7.9
Level of Service	C		B	B	C	A
Approach Delay (s)	24.1		17.6			11.6
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	65.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	83	162	560	161	168	764
Future Volume (veh/h)	83	162	560	161	168	764
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.98		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	91	178	615	177	185	840
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	0	0	0	0	0
Cap, veh/h	120	235	796	659	264	1209
Arrive On Green	0.22	0.20	0.42	0.42	0.15	0.64
Sat Flow, veh/h	547	1070	1900	1574	1810	1900
Grp Volume(v), veh/h	270	0	615	177	185	840
Grp Sat Flow(s),veh/h/ln	1622	0	1900	1574	1810	1900
Q Serve(g_s), s	8.7	0.0	15.5	4.1	5.4	16.0
Cycle Q Clear(g_c), s	8.7	0.0	15.5	4.1	5.4	16.0
Prop In Lane	0.34	0.66		1.00	1.00	
Lane Grp Cap(c), veh/h	356	0	796	659	264	1209
V/C Ratio(X)	0.76	0.00	0.77	0.27	0.70	0.69
Avail Cap(c_a), veh/h	730	0	1437	1190	358	1950
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	20.6	0.0	13.9	10.6	22.6	6.6
Incr Delay (d2), s/veh	3.3	0.0	1.6	0.2	3.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	5.7	1.2	2.4	4.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.9	0.0	15.5	10.8	26.4	7.3
LnGrp LOS	C	A	B	B	C	A
Approach Vol, veh/h	270		792			1025
Approach Delay, s/veh	23.9		14.5			10.7
Approach LOS	C		B			B

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	12.1	27.3			39.3	16.2
Change Period (Y+Rc), s	5.0	5.0			5.0	5.0
Max Green Setting (Gmax), s	10.0	41.0			56.0	24.0
Max Q Clear Time (g_c+I1), s	7.4	17.5			18.0	10.7
Green Ext Time (p_c), s	0.1	4.8			7.3	0.7

Intersection Summary	
HCM 6th Ctrl Delay	13.9
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	137	192	538	60	87	421
Future Volume (vph)	137	192	538	60	87	421
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.92		1.00	0.85	1.00	1.00
Flt Protected	0.98		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1679		1900	1579	1805	1900
Flt Permitted	0.98		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1679		1900	1579	1805	1900
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	151	211	591	66	96	463
RTOR Reduction (vph)	56	0	0	18	0	0
Lane Group Flow (vph)	306	0	591	48	96	463
Confl. Bikes (#/hr)		1		3		
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%
Turn Type	Prot		NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases				2		
Actuated Green, G (s)	17.1		27.2	27.2	6.2	38.4
Effective Green, g (s)	18.1		28.2	28.2	7.2	39.4
Actuated g/C Ratio	0.28		0.43	0.43	0.11	0.60
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	463		818	679	198	1142
v/s Ratio Prot	c0.18		c0.31		0.05	c0.24
v/s Ratio Perm				0.03		
v/c Ratio	0.66		0.72	0.07	0.48	0.41
Uniform Delay, d1	21.0		15.4	11.0	27.4	6.9
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5		3.2	0.0	1.9	0.2
Delay (s)	24.5		18.6	11.0	29.3	7.1
Level of Service	C		B	B	C	A
Approach Delay (s)	24.5		17.8			10.9
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	65.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	137	192	538	60	87	421
Future Volume (veh/h)	137	192	538	60	87	421
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.98		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	151	211	591	66	96	463
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	0	0	0	0	0
Cap, veh/h	189	264	764	632	185	1097
Arrive On Green	0.28	0.26	0.40	0.40	0.10	0.58
Sat Flow, veh/h	682	953	1900	1574	1810	1900
Grp Volume(v), veh/h	363	0	591	66	96	463
Grp Sat Flow(s),veh/h/ln	1640	0	1900	1574	1810	1900
Q Serve(g_s), s	11.3	0.0	14.8	1.4	2.8	7.5
Cycle Q Clear(g_c), s	11.3	0.0	14.8	1.4	2.8	7.5
Prop In Lane	0.42	0.58		1.00	1.00	
Lane Grp Cap(c), veh/h	453	0	764	632	185	1097
V/C Ratio(X)	0.80	0.00	0.77	0.10	0.52	0.42
Avail Cap(c_a), veh/h	749	0	1492	1236	331	1978
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	18.7	0.0	14.2	10.2	23.3	6.5
Incr Delay (d2), s/veh	3.3	0.0	1.7	0.1	2.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	5.5	0.4	1.2	2.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.0	0.0	15.9	10.3	25.5	6.7
LnGrp LOS	C	A	B	B	C	A
Approach Vol, veh/h	363		657			559
Approach Delay, s/veh	22.0		15.4			10.0
Approach LOS	C		B			A

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.6	26.0			35.6	19.1
Change Period (Y+Rc), s	5.0	5.0			5.0	5.0
Max Green Setting (Gmax), s	9.0	42.0			56.0	24.0
Max Q Clear Time (g_c+I1), s	4.8	16.8			9.5	13.3
Green Ext Time (p_c), s	0.1	4.2			3.1	0.9

Intersection Summary	
HCM 6th Ctrl Delay	15.0
HCM 6th LOS	B

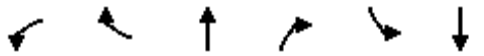
Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	89	164	560	186	186	764
Future Volume (vph)	89	164	560	186	186	764
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.91		1.00	0.85	1.00	1.00
Flt Protected	0.98		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1668		1900	1579	1805	1900
Flt Permitted	0.98		1.00	1.00	0.18	1.00
Satd. Flow (perm)	1668		1900	1579	341	1900
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	98	180	615	204	204	840
RTOR Reduction (vph)	77	0	0	53	0	0
Lane Group Flow (vph)	201	0	615	151	204	840
Confl. Bikes (#/hr)		1		3		
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%
Turn Type	Prot		NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)	13.5		27.8	27.8	41.2	41.2
Effective Green, g (s)	13.5		27.8	27.8	41.2	41.2
Actuated g/C Ratio	0.21		0.43	0.43	0.64	0.64
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	348		816	678	407	1209
v/s Ratio Prot	c0.12		0.32		0.07	c0.44
v/s Ratio Perm				0.10	0.25	
v/c Ratio	0.58		0.75	0.22	0.50	0.69
Uniform Delay, d1	23.0		15.6	11.6	8.6	7.7
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3		4.0	0.2	1.0	1.8
Delay (s)	25.4		19.5	11.8	9.6	9.4
Level of Service	C		B	B	A	A
Approach Delay (s)	25.4		17.6			9.4
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	64.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	89	164	560	186	186	764
Future Volume (veh/h)	89	164	560	186	186	764
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.98		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	98	180	615	204	204	840
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	0	0	0	0	0
Cap, veh/h	120	219	781	647	409	1154
Arrive On Green	0.21	0.21	0.41	0.41	0.10	0.61
Sat Flow, veh/h	571	1049	1900	1574	1810	1900
Grp Volume(v), veh/h	279	0	615	204	204	840
Grp Sat Flow(s),veh/h/ln	1626	0	1900	1574	1810	1900
Q Serve(g_s), s	8.9	0.0	15.4	4.8	3.1	17.0
Cycle Q Clear(g_c), s	8.9	0.0	15.4	4.8	3.1	17.0
Prop In Lane	0.35	0.65		1.00	1.00	
Lane Grp Cap(c), veh/h	340	0	781	647	409	1154
V/C Ratio(X)	0.82	0.00	0.79	0.32	0.50	0.73
Avail Cap(c_a), veh/h	655	0	1531	1268	518	2018
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	20.6	0.0	14.0	10.9	10.1	7.5
Incr Delay (d2), s/veh	4.9	0.0	1.8	0.3	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	5.7	1.4	0.9	4.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	25.5	0.0	15.8	11.2	11.1	8.4
LnGrp LOS	C	A	B	B	B	A
Approach Vol, veh/h	279		819			1044
Approach Delay, s/veh	25.5		14.6			8.9
Approach LOS	C		B			A

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	10.7	27.5			38.2	16.4
Change Period (Y+Rc), s	5.0	5.0			5.0	5.0
Max Green Setting (Gmax), s	9.0	44.0			58.0	22.0
Max Q Clear Time (g_c+I1), s	5.1	17.4			19.0	10.9
Green Ext Time (p_c), s	0.2	5.1			7.4	0.7

Intersection Summary	
HCM 6th Ctrl Delay	13.3
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.