TRANSIGHT CONSULTING, LLC
Transportation Engineering and Planning Services

Date:	September 28, 2022
To:	Tony Martin, PE, City of Salem
From:	Joe Bessman, PE
Project Reference No.:	1774
Project Name:	Bonaventure Titan Hill Multifamily Transportation Impact Analysis

This memorandum provides a formal Transportation Impact Analysis for the proposed Bonaventure Titan Hill multifamily development in west Salem, Oregon. This study meets the City's Transportation Impact Analysis requirements as provided in the City's Administrative Rules 109-006.33 and follows coordination and scoping discussions with the City.

The 36.72-acre site was previously rezoned to Multiple Family Residential 2 (RM2), allowing the proposed apartments as an outright allowable use. This prior analysis had assessed a trip cap based on 500 apartment units to limit the impacts of the site to the Wallace Road corridor.

The current development plan is to construct 427 apartment units on the site, which remains well below the prior trip cap. As these plans are still being finalized by the design team we are pursuing entitlements for a total of 450 apartments, so that some flexibility is available should the specific layout (or split between one- and two-bedroom units) change. At this time the specific breakdown of bedrooms per unit is not known.

PROJECT BACKGROUND

The subject property is Map Tax Lot 07317B000400, which is a 36.72-acre parcel located in the northwest quadrant of the Doaks Ferry Road/Orchard Heights Road intersection. The lot is currently vacant and contains two different zoning designations. The north end of the site was recently rezoned for Multiple Family Residential 2 (RM2) and the south end of the site is zoned for Mixed Use-II (MU-II).

The proposed development plans comprise the northern portion of the site, which was recently rezoned, as shown in Figure 1. The pentagon shaped area within the center of these lands is an existing residence that will remain. Access will be provided from "Street A" that extends east-west to Doaks Ferry Road, and from the Landaggard Drive NW extension. Additional street stubs are shown on the north and west ends of the site to connect to future development. As is discussed later in this report, "Street A" is recommended to be built as a Collector connection to Doaks Ferry Road and designed to a higher standard while Landaggard Drive potentially downgraded to a Local Street. Figure 2 illustrates the preliminary site layout for reference.

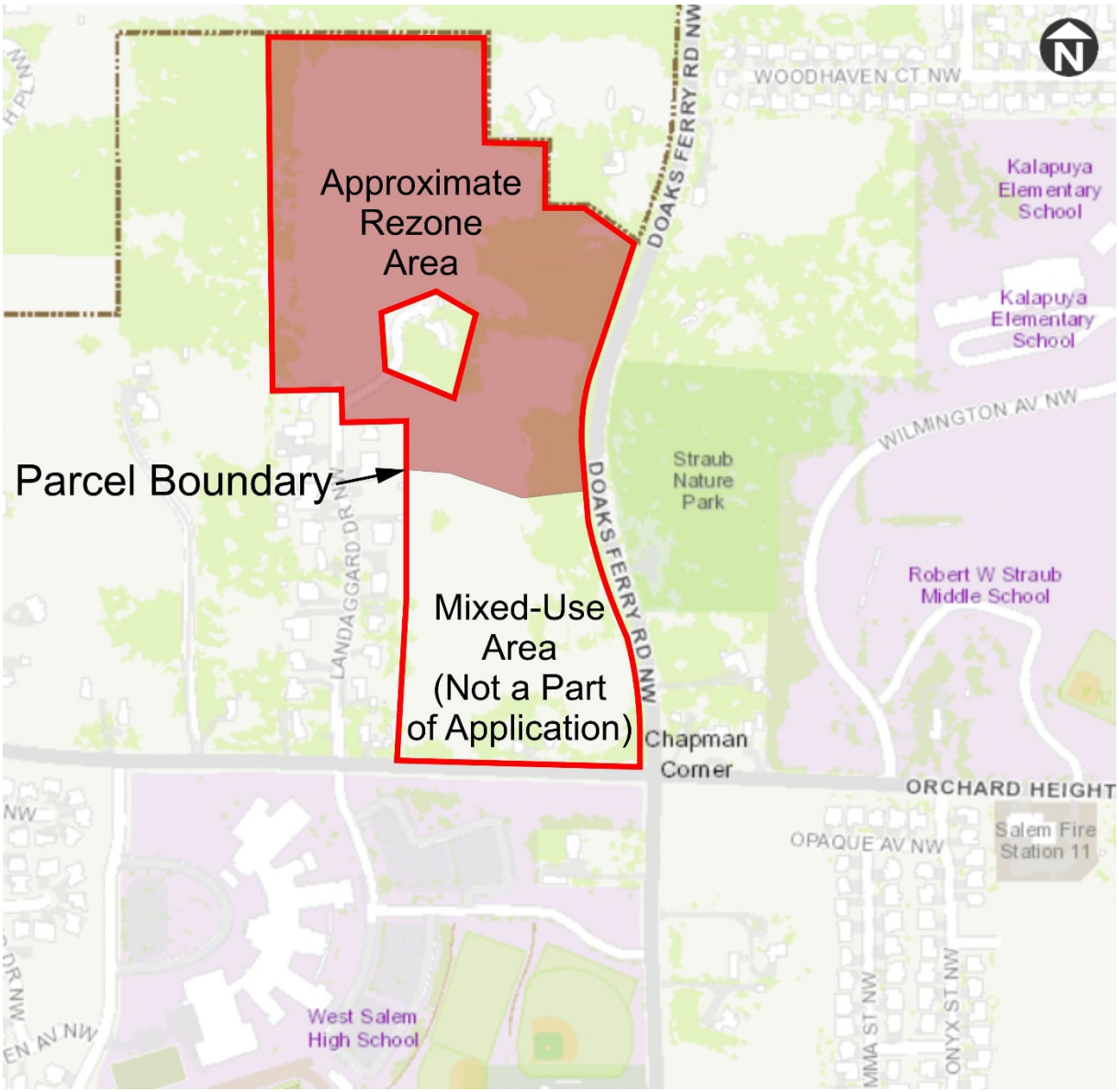


Figure 1. Site Vicinity Map illustrating the area subject to the approved rezone.

Figure 2. Preliminary development plan. *Source: Multi/Tech*

TRIP GENERATION ESTIMATES

Subsequent to the prior rezone application, standard trip generation rates within the Institute of Transportation Engineers' industry-reference *Trip Generation Manual, 11th Edition* has redefined the various classifications for apartments and now includes revised trip rates. Whereas the prior 10th Edition of the manual defined three-story apartments as "mid-rise" units, distinguishing these from townhomes and other types of one- and two-story attached products, the current manual has moved townhomes into their own land use classification, purged older data, and now distinguishes apartments based on those with three or fewer floors of living space ("Multifamily Housing (Low-Rise)") and those with four to ten floors ("Multifamily Housing (Mid-Rise)"). The Land Use Description from the ITE 10th Edition and the ITE 11th Edition is presented below for context, with the key change in definition highlighted.

> **ITE 10th Edition, Land Use 221: Multifamily Housing (Mid-Rise):** *Mid-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have between three and 10 levels (floors).*
>
> **ITE 11th Edition, Land Use 221: Multifamily Housing (Mid-Rise):** *Mid-rise multifamily housing includes apartments and condominiums located in a building that has between four and 10 floors of living space. Access to individual dwelling units is through an outside building entrance, a lobby, elevator, and a set of hallways.*

This change in definition requires that in applying the current *ITE Trip Generation, 11th Edition* that three-story apartments be reclassified to ITE Land Use 220: *Multifamily Housing (Low-Rise)*, which is defined below.

> **ITE 11th Edition, Land Use 220: Multifamily Housing (Low-Rise):** *Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have two or three floors (levels). Various configurations fit this description, including walkup apartment, mansion apartment, and stacked townhouse.*
>
> - *A walkup apartment typically is two or three floors in height with dwelling units that are accessed by a single or multiple entrances with stairways and hallways.*
> - *A mansion apartment is a single structure that contains several apartments within what appears to be a single-family dwelling unit.*
> - *A fourplex is a single two-story structure with two matching dwelling units on the ground and second floors. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.*
> - *A stacked townhouse is designed to match the external appearance of a townhouse. But, unlike a townhouse dwelling unit that only shares walls with an adjoining unit, the stacked townhouse units share both floors and walls. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.*

This change in land use classifications does not allow a direct comparison of the 500 apartment unit cap assumed within the rezone application to the reduced number of up to 450 units. As identified within the September 2021 scoping materials, there have been no changes to the original development plans for this site to include three-story buildings within this area:

> "Based on the application of the highest density permitted, 28 dwelling units per acre, it is expected that the multifamily units *would require three levels to achieve this density*. Therefore,

Land Use Code 221 for Multifamily Housing (Mid-Rise) would be most appropriate. Table 2 summarizes the trip generation potential of the site with RM2 zoning."

Source: September 13, 2001 Rezone application scoping materials, Transight Consulting

Accordingly, two trip generation estimates have been prepared to provide a direct comparison:

1) Comparison of trip rates consistently applying ITE's prior 10th Edition of the Trip Generation Manual, and
2) Updated trip generation estimate applying the revised definitions and trip rates within ITE's 11th Edition of the manual.

This consistent comparison shows that as the number of units have been reduced by 10% in either scenario the overall trip impacts should consistently be reduced by 10%.

Table 1. Trip Generation Comparison, ITE Trip Generation, 10th Edition

Land Use	ITE Code	Acreage/ Density	Metric	Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
					Total	In	Out	Total	In	Out
Original Rezone Application Trip Cap										
Multifamily Housing (Mid-Rise)	221	22.85 Acres/ 28.0 Units per Acre	500 units *17.85 Acres*	2,270 *4.54/Unit*	185 *0.37/Unit*	43 *23%*	142 *77%*	195 *0.39/Unit*	119 *61%*	76 *39%*
Proposed Development Plan										
Multifamily Housing (Mid-Rise)	221	19.7 Units/Acre	Up to 450 units *17.85 Acres*	2,043 *4.54/Unit*	167 *0.37/Unit*	38 *23%*	129 *77%*	176 *0.39/Unit*	107 *61%*	69 *39%*
Trip Difference (Proposed Development Plan – Approved Rezone Trip Cap)										
Proposed Development Plan – Approved Trip Cap				**-227**	**-18**	**-5**	**-13**	**-19**	**-12**	**-7**

As outlined above, the 50 unit reduction in site density provides a 10% decrease in the overall trip generation assumed within the prior analysis, and thereby complies with the rezone conditions of approval (which was limited to 2,270 weekday daily trips based on the 500 apartment units).

Revised trip generation estimates using ITE's most current 11th Edition is provided below, again showing a consistent comparison of trip rates. Note that all trip rates were calculated using the average rate equation per City policy; slightly lower trip rates would result from application of the fitted curve equations presented in the manual.

Table 2. Trip Generation Comparison, ITE Trip Generation, 11th Edition

Land Use	ITE Code	Acreage/ Density	Metric	Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
					Total	In	Out	Total	In	Out
Original Rezone Application Trip Cap, Updated to ITE 11th Edition										
Multifamily Housing (Mid-Rise)	221	22.85 Acres/ 28.0 Units per Acre	500 Units *17.85 Acres*	3,370 *6.74/Unit*	200 *0.40/Unit*	48 *24%*	152 *76%*	255 *0.51/Unit*	161 *63%*	94 *37%*
Proposed Development Plan										
Multifamily Housing (Low-Rise)	220	19.7 Units/Acre	Up to 450 units *17.85 Acres*	3,033 *6.74/Unit*	180 *0.40/Unit*	43 *24%*	137 *76%*	230 *0.51/Unit*	145 *63%*	85 *37%*
Trip Difference (Proposed – Existing)										
Proposed Development Plan – Existing Zoning Potential				**-337**	**-20**	**-5**	**-15**	**-25**	**-16**	**-9**

Text from the original rezone staff report is provided below:

> *"The submitted TPR analysis proposes a trip cap equal to 500 multifamily units on the site. The Assistant City Traffic Engineer concurs with the TPR analysis findings and recommends a condition to limit the development on the 24.84-acre site to 2,270 average [weekday] daily trips."*

Accordingly, while the rezone analysis was based on a density assumption, the more specific approval condition tying the site to the specific number of weekday daily trips appears to now exceed the trip cap due to the changing land use definition. However, with the consistent application of 10th Edition or 11th Edition trip rates the reduced site density remains in compliance with this prior analysis; it is only by mixing land use definitions and datasets between the 10th and 11th Edition of the manual that this compliance is not achieved.

We request that staff provide concurrence on this issue. Should staff consider the 2,270 weekday daily trip rate in the absence of the footnoted source for this value (ITE 10th Edition premised on 500 apartment units) we would want to meet and further discuss alternative TPR compliance options given the adoption of House Bill 2001.

While these trip generation numbers are intended to demonstrate compliance with the prior rezone approval, note that all operational analysis within this report is premised on the most current trip generation rates as shown in Table 2 (3,033 weekday daily trips, including 180 weekday morning commute hour trips and 230 weekday evening commute hour trips).

TRIP DISTRIBUTION AND ASSIGNMENT

Trip distribution patterns are expected to follow the previously approved patterns shown within the rezone analysis, allowing drivers to route toward area destinations using various travel options. For example, motorists heading toward Wallace Road and OR 22 could route east using either Orchard Heights Road or Glen Creek Road, and with the direct connection provided from "Street A" to Doaks Ferry Road either option would viable, with travel times dependent on travel conditions along Wallace Road.

There is also a localized element to the trip distribution pattern associated with residential uses, particularly within an area surrounded by two elementary schools, a middle school, and a high school.

Commercial goods and services for the city are primarily situated along Wallace Road, and recreation opportunities are also available within West Salem's parks.

The routing of trips to and from the site between the Doaks Ferry Road access and the Landaggard Drive connection will be dependent on the travel times and convenience of either route. Typical city connectivity policies do not support gated or restricted access between adjacent developments, but do allow various types of traffic calming treatments along local streets. For purposes of trip assignment it was assumed that the Landaggard Drive NW connection will support 30% of the site-generated trips, with the higher-order Collector connection of "Street A" serving 70% of the site-generated trips. At this time in the planning this is assumed as a project goal, and our team is aware that an even higher reliance on Doaks Ferry Road may be achievable. Further discussion of the proposed measures to help achieve this bias toward Doaks Ferry Road is separately discussed within this scoping report.

Note that this application does not include a connection to Grice Hill Road via Colorado Way NW. The internal street system supports this future connection but does not include the development of the adjacent parcel needed to complete this connection. If the connection were provided it would have limited impact near-term, as the properties to the west are rural, and the extended route would add travel time and delay in comparison to directly accessing Orchard Heights Drive NW from Landaggard Drive NW.

Estimated site-generated trips shown in Table 2 were assigned to the transportation system consistent with the distribution patterns. The weekday morning and evening traffic volumes are illustrated in Figure 3. Note that this application varies from the prior rezone analysis as the total impact will be assessed on the system, rather than the comparative difference between zoning scenarios.

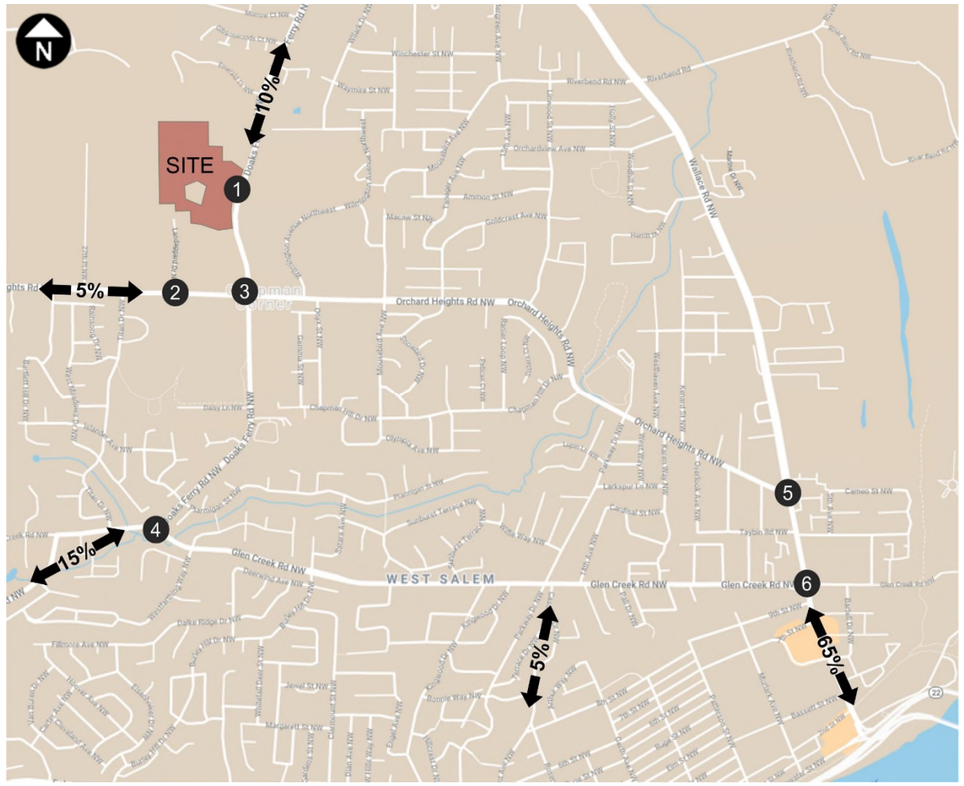
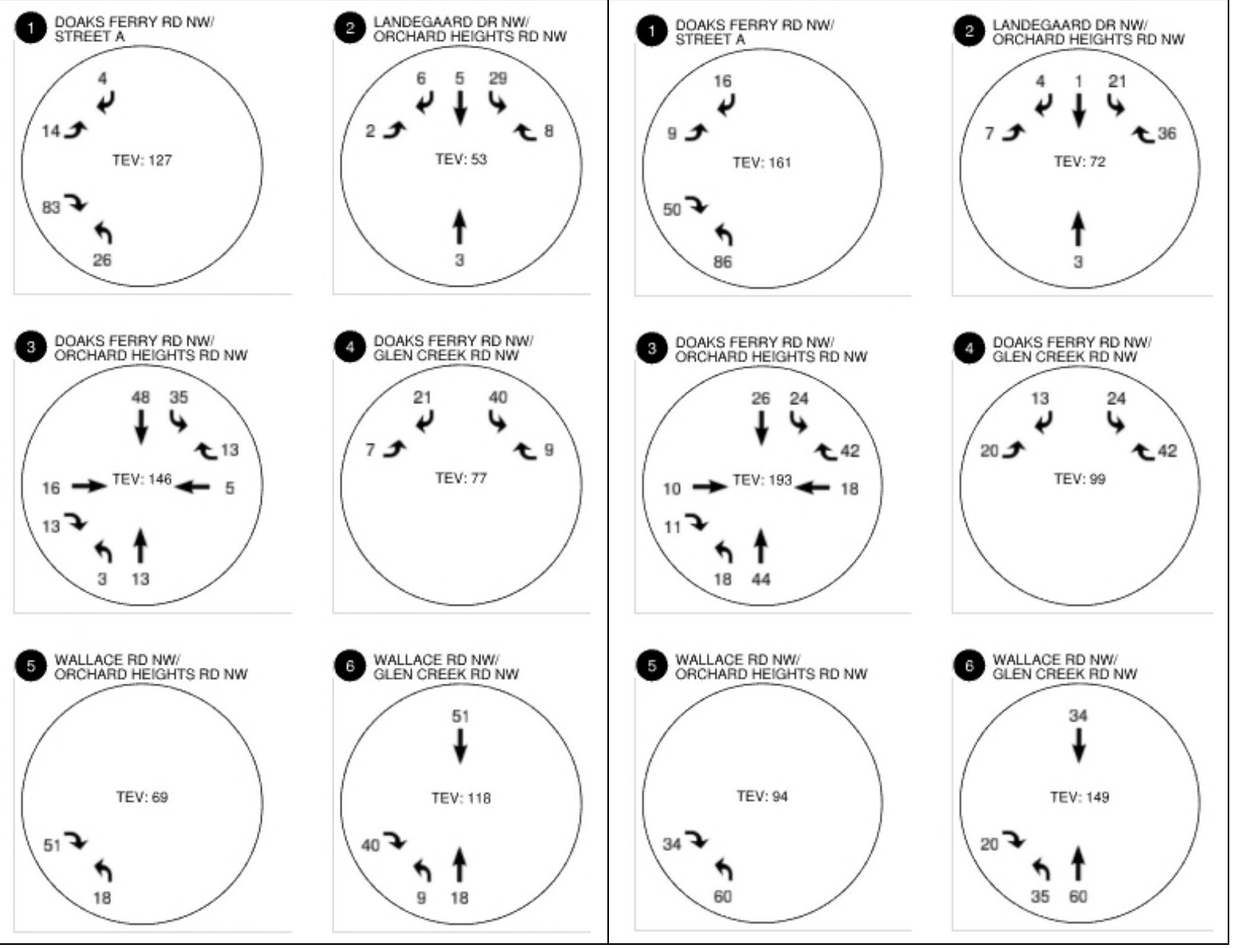


Figure 3. Estimated Trip Distribution and Assignment, Weekday AM and PM Peak Hours.

Site-Generated Trips, Weekday AM Peak Hour



Site-Generated Trips, Weekday PM Peak Hour

EXISTING TRAFFIC CONDITIONS

Existing Transportation Facilities

The proposed site is currently undeveloped and is located in a developing residential area. It is bordered on the west by a residential development and on the north by undeveloped land. Directly to the east is the Straub Nature Park and the Kalapuya Elementary School and Straub Middle School. West Salem High School is located directly south of the site. The area is characterized by residential neighborhoods to the west and south of the site.

Site access is being proposed from a new 'Street A' that will be connected to Doaks Ferry Road approximately 1,150 feet north of Orchard Heights Road. In addition, Landaggard Drive will be extended through the site to connect to 'Street A'.

The City of Salem Functional Classification map from the adopted 2018 Transportation System Plan identifies the major streets that surround the project site, as shown in Figure 4. This includes the following classified roadways:

- Doaks Ferry Road NW: Major Arterial
- Landaggard Drive NW: Collector
- Orchard Heights Road NW: Minor Arterial
- Glen Creek Road NW: Minor Arterial (East of Doaks Ferry Road NW)

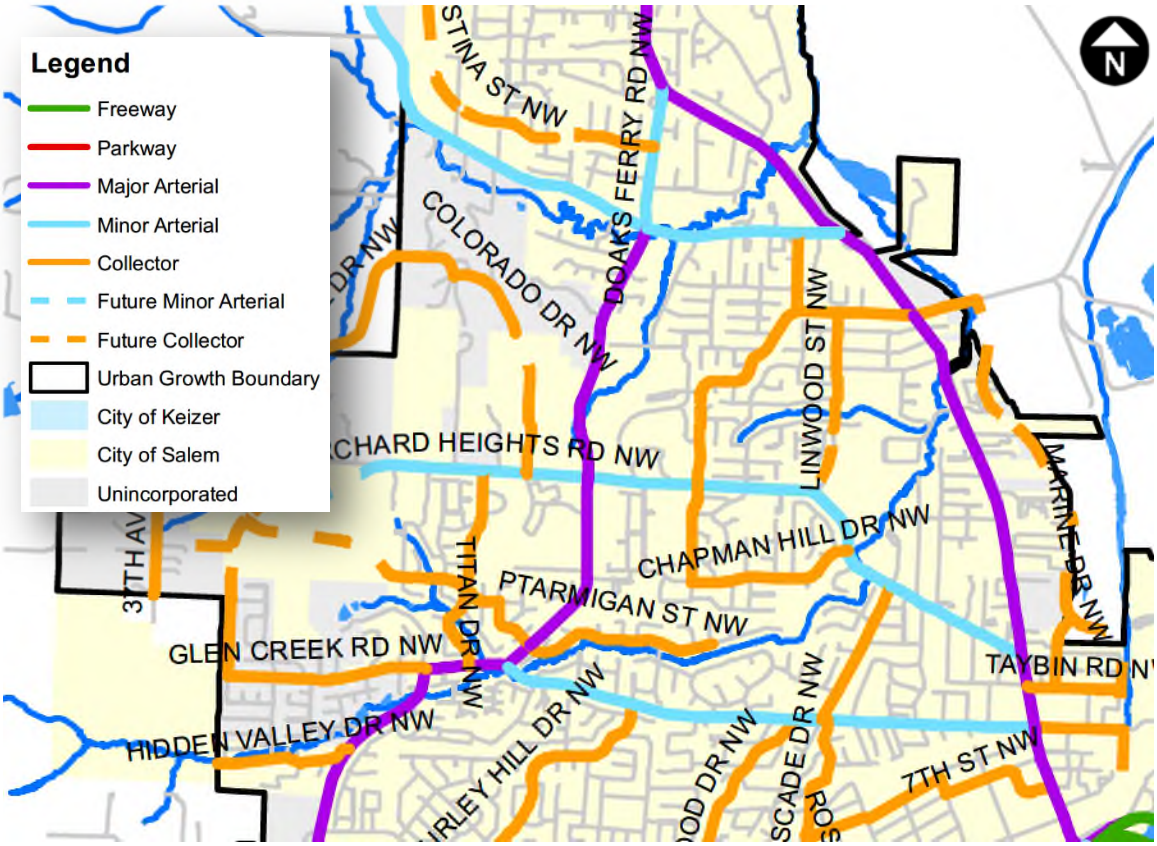


Figure 4. City of Salem Street System Element (Transportation System Plan Figure 3-11)

Table 3 summarizes additional characteristics of the existing area roadways included in this study.

Table 3. Existing Transportation Facilities

Roadway	Jurisdiction	Functional Classification	Cross Section	Speed	Shoulder /Bicycle Lanes	Side-walk	On-Street Parking
Doaks Ferry Rd NW	City of Salem	Major Arterial	2-3 Lanes	35 mph	Partial	Partial	No
Orchard Heights Rd NW	City of Salem	Minor Arterial	2-3 lanes	40 mph	Yes	Partial	No
Glen Creek Rd NW	City of Salem	Major Arterial/ Minor Arterial/ Collector	2 lanes	35 mph	Yes	Partial	Partial
Wallace Rd NW (Oregon 221)	ODOT	Major Arterial/ Regional Highway	5 lanes	35-45 mph	Yes	Yes	No
Landaggard Dr NW	City of Salem	Collector	2 lanes	NP	No	No	Partial

NP: Not Posted

Doaks Ferry Road, a *Major Arterial*, is a two-lane rural roadway along the site frontage with a paved shoulder on the west side and minimal shoulder on the east side. Between Orchard Heights Road and Coho Avenue, the roadway widens to three lanes with bicycle lanes and curbs along with sidewalks on the west side of the roadway and partial sidewalk coverage on the east side. South of Coho Avenue to Glen Creek Road, Doaks Ferry Road narrows to two lanes. No on-street parking is provided on Doaks Ferry Road in the study area.

Orchard Heights Road is classified as a Minor Arterial and varies between two and three lanes between Wallace Road and West Salem High School, just west of Doaks Ferry Road. Bicycle lanes are provided throughout this section on both sides of the road. Complete sidewalks are provided in the vicinity of West Salem High School and Straub Middle School, though are not continuous through the entire study area.

Glen Creek Road is classified as a *Major Arterial* between the west intersection of Doaks Ferry Road/Glen Creek Road and the east intersection of Doaks Ferry Road/Glen Creek Road. The classification changes to *Minor Arterial* between Doaks Ferry Road and Wallace Road, and then changes again to *Collector* east of Wallace Road. Glen Creek Road is generally a two-lane roadway with turn lanes at select intersections. Bicycle lanes are provided throughout the study area.

Wallace Road (Oregon 221) is an ODOT facility that is classified by the City as a *Major Arterial* and by ODOT as a *Regional Highway*. Within the study area, it has a five-lane cross section with sidewalks, curbs, and bicycle lanes. A raised median is provided through parts of the study section. Oregon 221 provides a regional connection between Oregon 22 in Salem and Oregon 233 in Dayton.

Landaggard Drive is a City street and is classified as a *Collector* within the City's Transportation System Plan. It has direct access onto Orchard Heights and is planned to be extended into the proposed development. There are no sidewalks or bicycle lanes on the street currently, with an uncurbed edge treatment throughout its length. On-street parking is available on portions of the roadway. Given the rural design of the roadway and the direct access to abutting properties, this roadway may be better suited to a *Local Road* classification. This is further discussed later in the report under *Transportation System Plan Amendment*.

Transit Service

Transit service in the area is provided by Cherriots. Bus service is generally provided Monday through Saturday between 5:30 a.m. and 9:00 p.m. depending on the route and schedule. No service is provided on Sunday or holidays. Two bus routes (Route 16 and 26) operate along the site frontage. The nearest stop is located on Orchard Heights Road just east of the Doaks Ferry Road intersection.

Bus Route 16 – Wallace Road

Bus Route 16 connects West Salem with the City's Downtown Transit Center. Within the study area, it travels on Wallace Avenue, south on Doaks Ferry Road and east on Orchard Heights Road. Figure 5 depicts the bus route and the bus stop locations. Buses operate on hourly headways on weekdays and Saturday.

Figure 5. Bus Route 16. *Source: cherriots.org.*

Bus Route 26 – Glen Creek/Orchard Heights

Bus Route 26 serves the west side of Salem providing service from the West Salem Transit Center to the west on Glen Creek Road, north on Titan Drive and east on Orchard Heights Road. Figure 6 depicts the bus route and the bus stop locations. Buses operate on hourly headways on weekdays. No service is provided on weekends.

Figure 6. Bus Route 26. *Source: cherriots.org.*

Based on information provided at the pre-application, Cherriots plans to install a new transit stop along Doaks Ferry Road south of the intersection with "A" Street. This would provide adjacent transit service to the project site interconnected with the planned sidewalks for convenient access. Accommodations for this service will be incorporated into the civil plans.

TRAFFIC OPERATIONS

The analysis of traffic operations was prepared using Synchro 10 software and Highway Capacity Manual 6th Edition and 2000 operations methods. This included typical ODOT calibrations as outlined within the Analysis Procedures Manual such as peak hour factors and reduced ideal saturation flow rates. A supplemental analysis was also prepared for the Wallace Road intersections using ODOT's Critical Movement Analysis technique, though this methodology (which is based on the 1985 Highway Capacity Manual) has limitations in how it assesses more complex traffic signal operations such as those along Wallace Road and so is not reported within this report but is instead included as an attachment. The study intersections are under the jurisdiction of ODOT and the City of Salem, and each contains varying operation standards.

ODOT identifies mobility targets on state facilities in the Oregon Highway Plan. Action 1F.1 of the Highway Plan specifies that the maximum volume-to-capacity ratio for intersections on a *Regional Highway* inside the Urban Growth Boundary and within an MPO is 0.95.

The City of Salem Administration Rules 109-006 defines the maximum operation standards for City intersections. Signalized intersections must operate at LOS E or better and with a v/c ratio of less than 0.90. Two-way stop-controlled intersections have a standard of LOS E or better.

STUDY INTERSECTIONS

The City of Salem requirements for a Transportation Impact Analysis are included within Division 006 (Street Design Standards) Section 6.33. This policy requires that traffic studies assess site access points, intersections that are impacted by 50 or more weekday p.m. peak hour trips (or local streets impacted by more than 20 trips), intersections where the site-generated trips increase traffic on a given approach by more than 10%, or as identified by City staff based on known safety, capacity, neighborhood, or geometric concerns. ODOT's typical study intersection threshold is 50 or more weekday p.m. peak hour trips based

on typical criteria within Division 051. Accordingly, the following locations were identified for analysis in coordination with City staff.

- Doaks Ferry Road / Street "A" (*Collector* connection)
- Orchard Heights Drive / Landaggard Drive (*Local* connection) – West Salem HS Entrance
- Doaks Ferry Road NW / Orchard Heights Road NW
- Doaks Ferry Road NW / Glen Creek Road NW
- Wallace Road NW (OR 221) / Orchard Heights Road NW
- Wallace Road NW (OR 221) / Glen Creek Road NW

Beyond these intersections NW Wallace Road continues south to the Marion Street and Center Street Bridge, with Taggert providing access to adjacent commercial uses and Edgewater serving as a metering signal and merge back into a two-way arterial from the bridge couplets, then traffic operations are merge and diverge movements competing with traffic from Dallas, Monmouth, Independence, and other rural areas that converge along the OR 22 corridor.

EXISTING TRAFFIC OPERATIONS

As part of the rezone application, traffic counts were collected throughout the study area on Thursday, September 16 of 2021 during the weekday morning (6:00 – 9:00 a.m.) and evening (2:00 – 6:00 p.m.) peak periods. This time period reflects typical midweek commute period conditions during the school year and covers the morning arrival and afternoon departure times of the nearby schools. An additional traffic count was collected on Tuesday, September 13, 2022 at the Orchard Heights Drive/Landaggard Drive – West Salem HS Entrance for the same peak periods to reflect current school trends and reflect the implications of the TSP-identified Collector connection to Orchard Heights Road NW.

The proposed site is located within half a mile of four schools: West Salem High School, Straub Middle School, Kalapuya Elementary School, and Chapman Hill Elementary School. Current school start times range from 7:50 a.m. for the Elementary Schools to 9:20 a.m. for the Middle School. The school release times range from 2:20 p.m. for the Elementary Schools to 4:00 p.m. for Middle School, with the High School falling within this time range. Due to the proximity of the schools to some of the study intersections, the peak hour for an intersection varies based on its location.

Figure 7 depicts the total entering volume for the study intersections during the study periods. As shown in the figure, the peak periods vary substantially between the study intersections on Doaks Ferry Road and Wallace Road, particularly during the afternoon and evening study period (the peak hour assessed in this report is depicted in the figure by the grey bar). The peak hours for the intersections on Wallace Road are generally from 7:20 to 8:20 a.m. and 4:35 to 5:35 p.m. while the peak hours for the intersections on Doaks Ferry Road are generally from 7:30 to 8:30 a.m. and 3:20 to 4:20 p.m. reflective of nearby school conditions.

September 16, 2021 Traffic Volume Trends

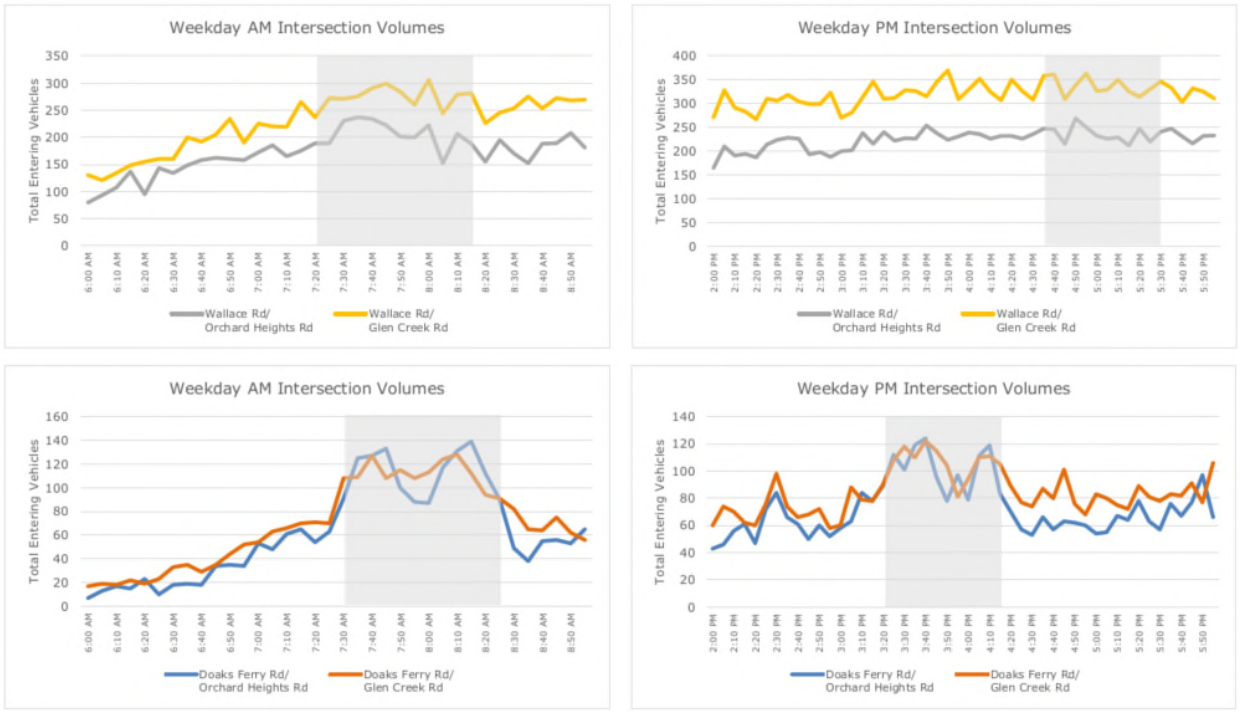


Figure 7. Study Intersection Weekday AM and PM Peak Hours.

The traffic volumes were also compared to pre-COVID traffic counts collected on January 20, 2020. These counts showed multiple differences in travel trends. At the intersections on Wallace Road, the weekday a.m. peak hour was from 6:40 to 7:40 a.m. and p.m. peak hour was from 4:05 to 5:05 p.m. At the intersections on Doaks Ferry Road, the weekday peak hours were from 7:00 to 8:00 a.m. and from 2:50 to 3:50 p.m. These are all earlier peak hours than the most recent September 2021 counts. Part of this may be due to the change in school hours between the two sets of counts. During the January 2020 counts West Salem High School started school at 7:30 a.m. and ended at 2:20 p.m., and Kalapuya Elementary School started school at 9:15 a.m. and ended at 3:30 p.m. The other school hours were within these arrival and departure times. Figure 8 shows the traffic volumes from the January 2020 counts at the study intersections.

January 20, 2020 Traffic Volume Trends

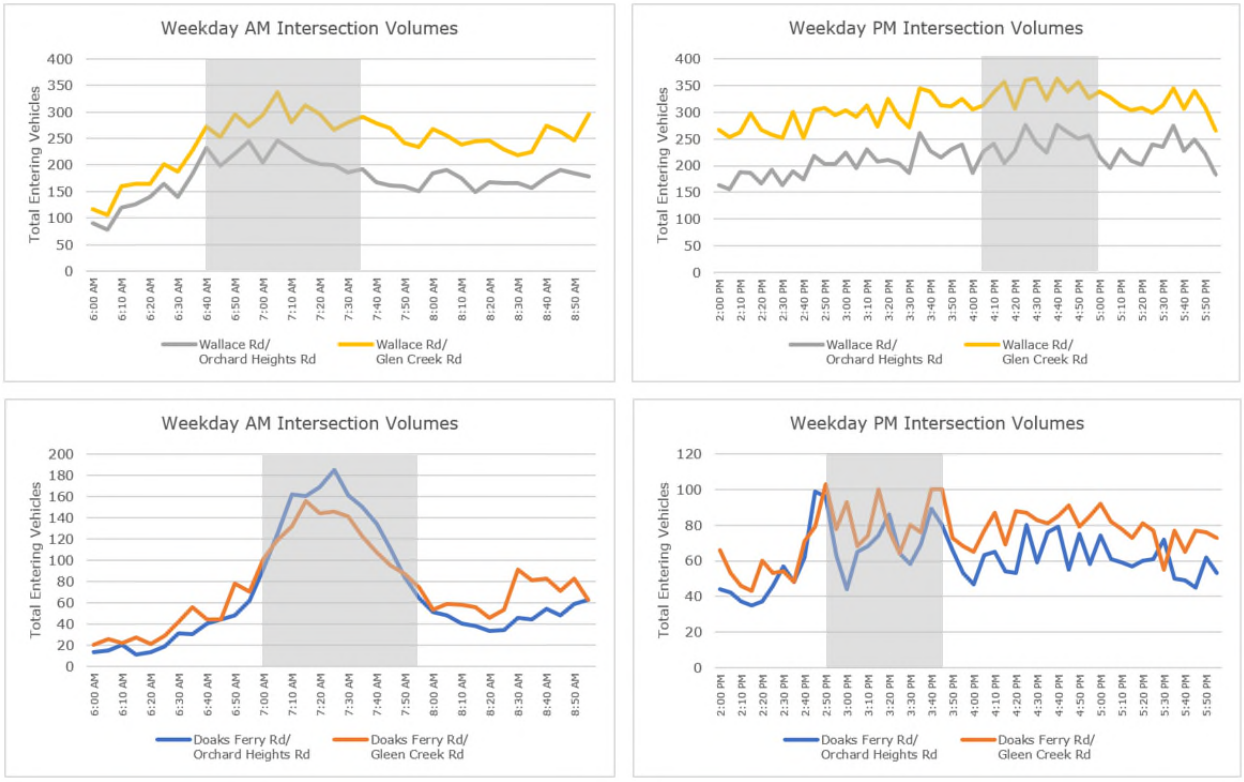


Figure 8. Historical Weekday AM and PM Peak Hour Volumes.

Figure 9 and Table 4 provide a comparison between the base peak hour turning movement counts with no adjustments at each intersection between the January 2020 and September 2021. The count with the higher total entering volume is circled/highlighted in red for each intersection and time period, which is the count that was applied throughout this analysis, similar to the approach within the previous rezone analysis. It is expected that home-schooling and work-from-home trends factor heavily in these patterns.

Table 4. Summary of Traffic Counts

Intersection	Weekday AM Peak Hour			Weekday PM Peak Hour		
	January 2020	September 2021	% Change	January 2020	September 2021	% Change
1: Doaks Ferry Rd/ Orchard Heights Rd	1,595	1,340	84%	875	1,208	138%
2: Doaks Ferry Rd/ Glen Creek Rd	1,425	1,337	94%	1,013	1,268	125%
3: Wallace Rd/ Orchard Heights Rd	2,567	2,470	96%	2,904	2,854	98%
4: Wallace Rd/ Glen Creek Rd	3,474	3,298	95%	4094	4049	99%

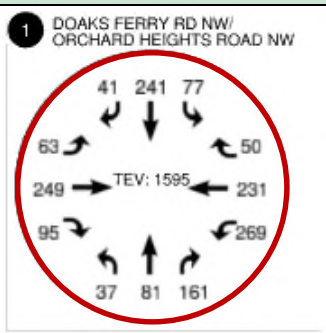
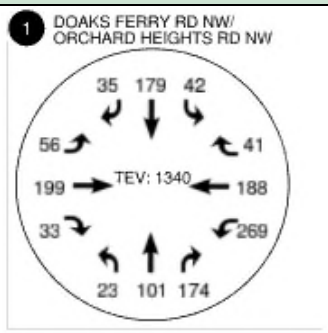
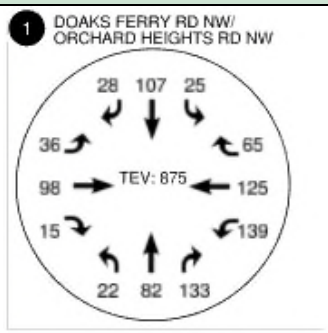
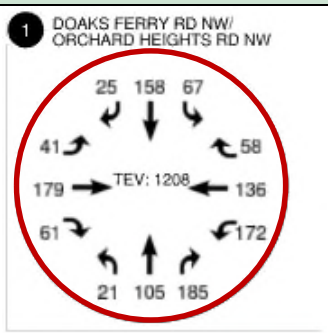
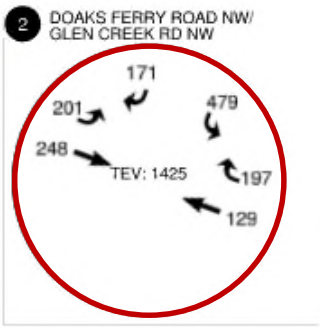
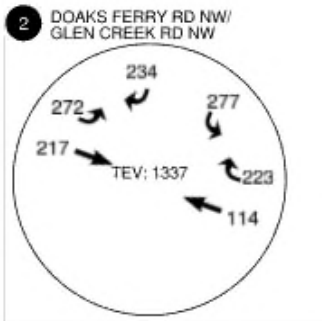
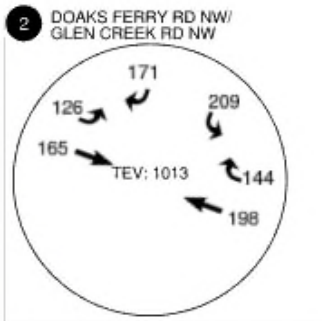
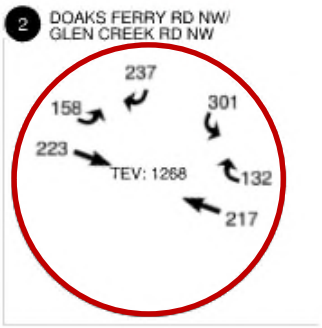
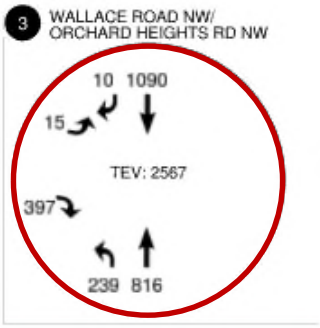
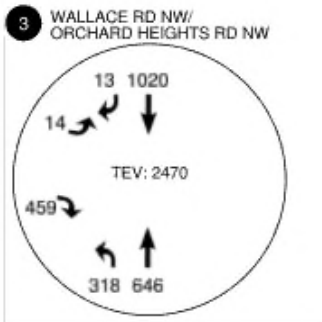
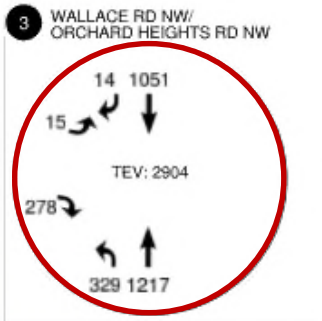
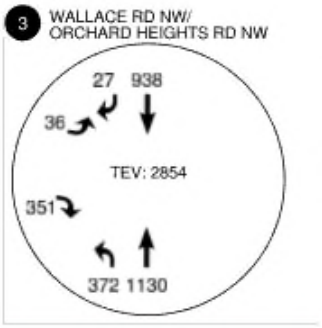
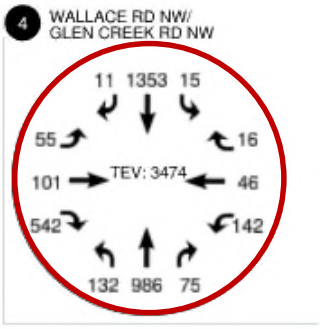
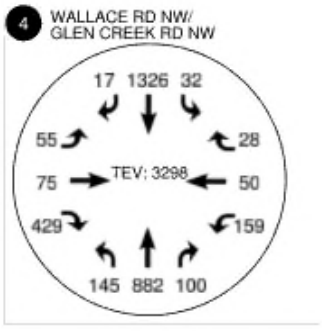
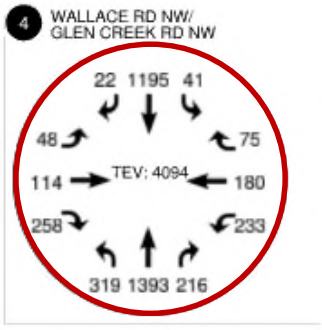
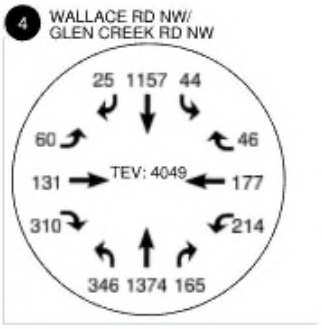
Weekday AM Peak Hour Turning Movement Counts		Weekday PM Peak Hour Turning Movement Counts	
January 30, 2020	**September 16, 2021**	**January 30, 2020**	**September 16, 2021**
			
			
			
			

Figure 9. Turning Movement Volume Comparison.
TEV: Total Entering Vehicles.

To provide a reasonable and conservative analysis, the intersections on Doaks Ferry Road were analyzed with the more recent September 2021 counts. These intersections are greatly impacted by school traffic and reflect the current travel patterns from the changes in school hours. These intersections also have much higher traffic volumes during the September 2021 weekday p.m. peak hour traffic counts. The intersections on Wallace Road were analyzed with the older, January 2020 traffic counts, reflecting the higher and more conservative traffic volumes. These traffic volumes are minimally impacted by the changes in school hours, but may be impacted by the extended work hour flexibility particularly present through this period within both the private and public sectors.

Each intersection was analyzed for its individual peak volumes to ensure a reasonable worst-case analysis. To account for the seasonal variations on the highway, ODOT's Automatic Traffic Recorder Station 24-014 was reviewed for the past five years. This resulted in a seasonal adjustment of 12% being applied to the January traffic counts to approximate peak summer traffic volumes (which very conservatively mixes school traffic within the counts with the higher summer trends). For the purpose of estimating current traffic volumes from the 2020 traffic counts, these volumes were then increased by a growth rate of 2.0-percent to account for area growth since the data collection occurred (providing the same adjusted base counts as the prior rezone analysis).

The counts used in the analysis and the applied adjustments are summarized in Table 5. The weekday a.m. peak hour and resulting 30th highest hourly traffic volumes are summarized and shown in Figure 10.

Table 5. Study Intersection Counts

Intersection	Count Date	Growth Rate	Seasonal Adjustment
Orchard Heights Road/Landaggard Dr	9/23/2022	n/a	n/a
Doaks Ferry Rd/Orchard Heights Rd	9/16/2021	n/a	n/a
Doaks Ferry Rd/Glen Creek Rd	9/16/2021	n/a	n/a
Wallace Rd/Orchard Heights Rd	1/30/2020	2%	12%
Wallace Rd/Glen Creek Rd	1/30/2020	2%	12%

Given the concerns raised as part of the prior application, a summary of the base traffic volume development is as follows:

- Traffic counts were collected in late January 2020 and again in mid-September 2021.
- In the morning commute period the 2020 counts were higher throughout the study area than those in mid-September 2021.
- The afternoon commute period experienced higher traffic volumes in 2021 along Doaks Ferry Road NW, but higher volumes in 2020 along Wallace Road.
- The highest traffic counts at each location were selected for analysis.
- Counts on Wallace Road were additionally factored by 12% to reflect peak annual conditions (30th highest hourly design hour volumes).
- An annual growth rate of 2% was applied to the locations that used the 2020 traffic counts to reflect annual population growth, despite the reduced volumes experienced in 2021.

- The traffic counts capture pedestrian, cyclist, truck, and motor vehicle trips throughout the assessed time periods.
- All analysis used in the report are premised on the peak 15-minute period from these adjusted traffic counts. This generally reflects the school impacts along Doaks Ferry Road NW.

The existing traffic conditions reflect the current operations throughout the study area during the weekday a.m. and p.m. peak hours. This analysis is used to calibrate operational models to field conditions. A summary of the existing conditions analysis is presented in Table 6.

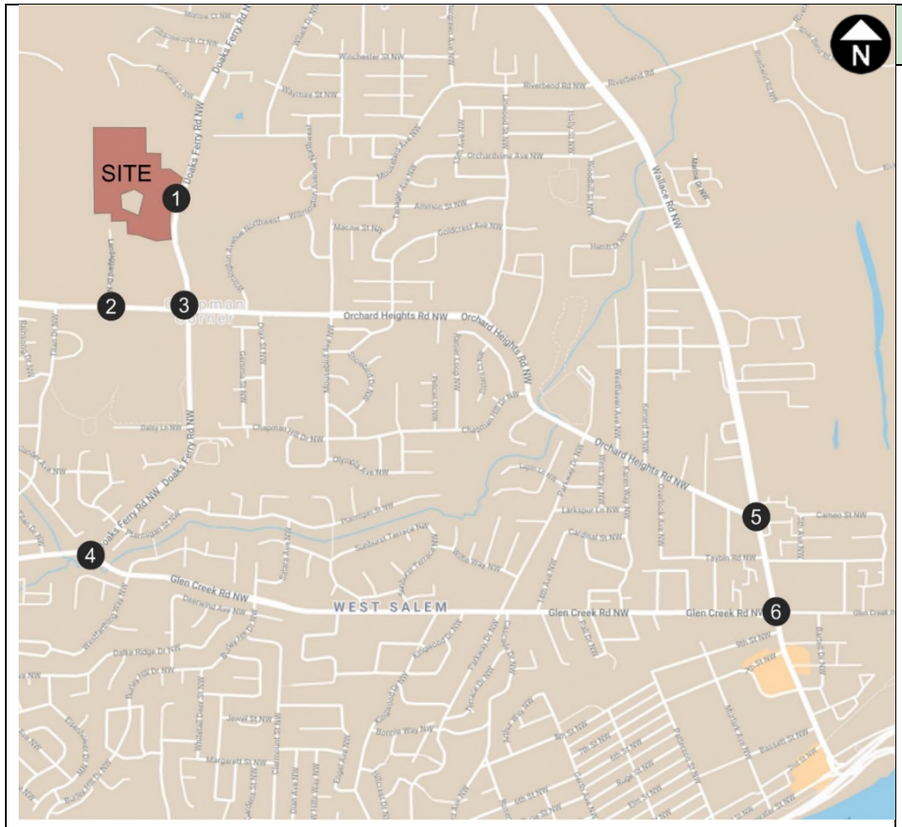
This analysis shows that all study intersections currently meet jurisdiction standards, with the Wallace Road (OR 221)/Glen Creek Road approaching the target mobility standards during the 30th highest hour. This intersection is located near the Willamette Bridge crossing where all of West Salem's traffic consolidates to connect to the City's downtown core to the east. In this area all traffic from OR 22 west of Salem is consolidated with West Salem traffic.

In addition, as is typical at any school entrance the Landaggard Drive NW intersection with Orchard Heights Drive NW also experiences elevated delays during the school peaks. The morning commute period is more critical at the intersection, with the southbound approach operating at Level of Service "E" despite the low volumes. This appears due primarily to the concentrated peaking conditions, with traffic volumes during the peak arrival period doubling from the preceding time periods.

Table 6. Summary of Existing Traffic Conditions

Intersection	Performance Standard	Weekday AM Peak Hour				Weekday PM Peak Hour/30th Highest Hour			
		LOS	Delay (sec)	v/c Ratio	95th % Queue	LOS	Delay (sec)	v/c Ratio	95th % Queue
1: Doaks Ferry Rd/ Street A (Access)	LOS E v/c ≤ 0.90								
2: Orchard Heights Rd/ Landaggard Dr NW	LOS E v/c ≤ 0.90	SB LOS E	SB 36.2	SB 0.15	SB: 25 ft WBL: 50 ft NBL: 25 ft NBR: 50 ft	SB LOS D	SB 26.8	SB 0.14	SB: 25 ft WBL: 25 ft NBL: 25 ft NBR: 50 ft
3: Doaks Ferry Rd/ Orchard Heights Rd	LOS E v/c ≤ 0.90	B	17.4	0.63	EB L: 40 ft EB TR: 215 ft WB L: 160 ft WB TR: 165 ft NB L: 30 ft NB TR: 210 ft SB L: 40 ft SB TR: 190 ft	B	18.1	0.58	EB L: 30 ft EB TR: 200 ft WB L: 100 ft WB TR: 135 ft NB L: 25 ft NB TR: 195 ft SB L: 55 ft SB TR: 145 ft
4: Doaks Ferry Rd/ Glen Creek Rd	LOS E v/c ≤ 0.90	B	12.1	0.67	EB L: 100 ft EB T: 85 ft WB TR: 195 ft SB L: 195 ft SB R: 50 ft	B	11.2	0.64	EB L: 65 ft EB T: 90 ft WB TR: 210 ft SB L: 210 ft SB R: 50 ft
5: Wallace Rd/ Orchard Heights Rd	v/c ≤ 0.95	C	24.5	0.75	EB L: 40 ft EB R: 410 ft NB L: 250 ft NB T: 170 ft SB TR: 520 ft	C	20.8	0.78	EB L: 45 ft EB R: 320 ft NB L: 340 ft NB T: 290 ft SB TR: 550 ft
6: Wallace Rd/ Glen Creek Rd	v/c ≤ 0.95	D	35.1	0.85	EB L: 100 ft EB T: 135 ft EB R: 275 ft WB L: 105 ft WB TR: 80 ft NB L: 130 ft NB T: 460 ft NB R: 10 ft SB L: 20 ft SB TR: 810 ft	D	43.7	0.91	EB L: 95 ft EB T: 155 ft EB R: 110 ft WB L: 150 ft WB TR: 295 ft NB L: 255 ft NB T: 930 ft NB R: 100 ft SB L: 60 ft SB TR: 855 ft

BOLD: Performance standard not met



Weekday AM Peak Hour

1 DOAKS FERRY RD NW/ STREET A
256
THURSDAY
9/16/2021
7:30 AM
TEV: 454
198

2 LANDAGGARD DR NW/ ORCHARD HEIGHTS RD NW
5 1 7
2 10
171 104
115 190
7 153
TUESDAY
9/13/2022
7:25 AM
TEV: 765

3 DOAKS FERRY RD NW/ ORCHARD HEIGHTS RD NW
35 179 42
56 41
199 188
33 269
23 101 174
THURSDAY
9/16/2021
7:30 AM
TEV: 1340

4 DOAKS FERRY RD NW/ GLEN CREEK RD NW
234 277
272 223
217 114
THURSDAY
9/16/2021
7:30 AM
TEV: 1337

5 WALLACE RD NW/ ORCHARD HEIGHTS RD NW
10 1112
15
405
244 832
WEDNESDAY
1/22/2020
6:40 AM
TEV: 2618

6 WALLACE RD NW/ GLEN CREEK RD NW
11 1380 15
56 16
103 47
553 145
135 1006 77
WEDNESDAY
1/22/2020
6:50 AM
TEV: 3544

Weekday PM Peak Hour/ 30th Highest Hour

1 DOAKS FERRY RD NW/ STREET A
250
THURSDAY
9/16/2021
3:20 PM
TEV: 454
204

2 LANDAGGARD DR NW/ ORCHARD HEIGHTS RD NW
3 12
7
168 153
18 70
21 2 118
TUESDAY
9/13/2022
3:15 PM
TEV: 572

3 DOAKS FERRY RD NW/ ORCHARD HEIGHTS RD NW
25 158 67
41 58
179 136
61 172
21 105 185
THURSDAY
9/16/2021
3:20 PM
TEV: 1208

4 DOAKS FERRY RD NW/ GLEN CREEK RD NW
237
158 301
223 132
217
THURSDAY
9/16/2021
3:20 PM
TEV: 1268

5 WALLACE ROAD NW/ ORCHARD HEIGHTS RD NW
16 1190
17
315
372 1378
WEDNESDAY
1/22/2020
4:05 PM
TEV: 3288

6 WALLACE RD NW/ GLEN CREEK RD NW
25 1353 42
54 77
116 184
292 238
361 1577 220
WEDNESDAY
1/22/2020
4:10 PM
TEV: 4539

Figure 10. Existing Traffic Volumes, Weekday AM and PM Peak Hour.

SAFETY REVIEW

The safety review included field review of the area, review of historical crash data, and field verification of intersection sight distance at the proposed connection to the new multifamily site.

Historical Crash Records

Crash records were obtained for all of Polk County from the ODOT crash database between January 2016 and December 2020, which reflects the most recent five-years of data available. Crashes required for reporting during this period include those involving any level of personal injury or property damage exceeding $1,500 (increased to $2,500 in 2018). Intersection crash histories are summarized in Table 7.

Table 7. Intersection Crash History (January 2016 through December 2020)

Intersection/ Street Segment	# of Crashes	Severity		Crash Type					Crash Rate per MEV	ODOT 90th % Rate
		Injury	Non-Injury	Turning/ Angle	Rear-End	Side-swipe	Ped	Other		
1: Doaks Ferry Rd/ Street A (Access)	0	0	0	0	0	0	0	0	0.00	3ST: 0.293 *Urban*
2: Orchard Heights Rd/ Landaggard Dr NW	0	0	0	0	0	0	0	0	0.00	4ST: 0.408 *Urban*
3: Doaks Ferry Rd/ Orchard Heights Rd	10	7	3	5	3	1	1	0	0.45	4SG: 0.860 *Urban*
4: Doaks Ferry Rd/ Glen Creek Rd	5	4	1	3	1	0	0	1 *Fixed Object*	0.22	3SG: 0.509 *Urban*
5: Wallace Rd/ Orchard Heights Rd	36	22	14	4	27	3	0	2 *Fixed Object*	0.60	3SG: 0.509 *Urban*
6: Wallace Rd/ Glen Creek Rd	59	30	29	20	31	3	3	2 *Head-on, Parking*	0.71	4SG: 0.860 *Urban*

As shown in Table 7, crash rates per million entering vehicle were also calculated for all the study intersections. This rate is often used to assess whether a geometric or traffic control deficiency is present when the crash rate is greater than 1.0 per million entering vehicles. ODOT also provides crash rates separated by control type and the number of approaches, which better distinguish between varying intersection forms and are provided for reference.

The table shows that all intersections experienced a crash rate less than 1.0 crashes per million entering vehicles and all are below ODOT's 90th percentile crash rates with the exception of the Wallace Road/Orchard Heights Road intersection. In addition, the number of overall crashes at the Wallace Road/Glen Creek Road intersection is high. The crash histories at both intersections are discussed further below.

Wallace Road / Orchard Heights Road

The Wallace Road/Orchard Heights Road intersection had a crash rate greater than ODOT's 90th percentile crash rate for signalized, three-legged intersections in the urban area. Additional details about the crashes are summarized below.

- Overall, there is a decreasing trend in the number of crashes reported at this intersection each year. Figure 11 illustrates the annual number of crashes at the intersection over the five-year review period.

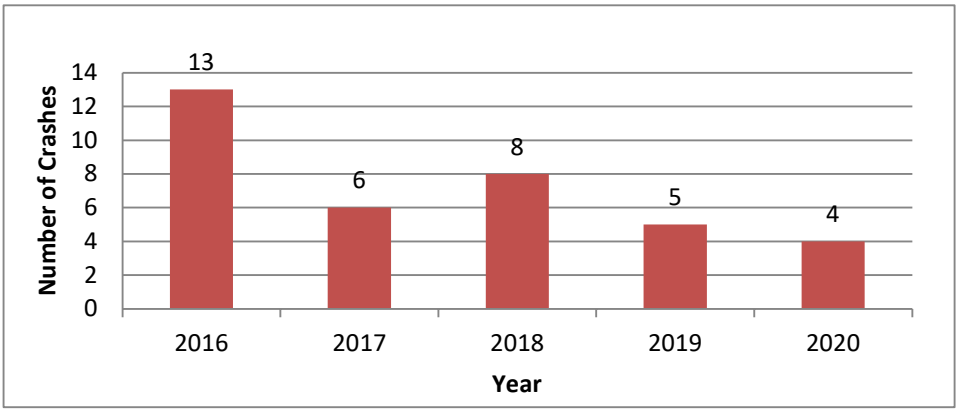


Figure 11. Wallace Road/Orchard Heights Road Annual Crash History.

- Most of the crashes (27) were rear-end collisions. Nine of these resulted in property damage only and 18 were reported as injury crashes. Only six of these occurred in the northbound direction and 21 occurred in the southbound direction. It is not clear why there is a discrepancy between the directions. Most of the crashes were attributed to "following too closely" or "inattention." Just north of the intersection there is a speed reduction from 45 miles per hour to 35 miles per hour and there is a downgrade on the approach. However, speed was only mentioned in three of the southbound crashes and two of the northbound crashes. It is recommended that this intersection be monitored and reviewed should the overall crash trend increase. Additional treatments may be needed to address rear-end crashes in the southbound direction.
- No patterns were observed among the remaining 9 crashes, which were attributed to turning, sideswipe, and fixed object collisions.

Wallace Road / Glen Creek Road

Although the Wallace Road/Glen Creek Road had an overall crash rate less than ODOT's 90th percentile crash rate for 4-legged, signalized urban intersections, it did experience an overall high number of crashes. Additional information is provided below.

- The Wallace Road/Glen Creek Road intersection is located in a congested area with numerous driveways in close proximity to the functional area of the intersection. Of the 59 crashes recorded within or near the intersection, 14 are attributed to driveways.
- Of the 59 total crashes reported at this intersection, 30 resulted in injuries and 29 resulted in property damage only.
- Of the 31 rear-end collisions, 2 occurred on the westbound approach, 19 occurred on the southbound approach, 6 occurred on the northbound approach, 3 occurred on the eastbound approach, and one was unknown.
- Three pedestrian crashes were reported as pedestrians illegally in the roadway or disregarding the traffic signal. The crashes resulted in suspected minor injury or possible injury. One crash was reported involving a southbound vehicle and a westbound pedestrian. Another crash involved an eastbound vehicle and a southbound pedestrian within the crosswalk. The third crash involved a northbound vehicle and an eastbound pedestrian south of the intersection.

- Twenty turning collisions were reported at this intersection, half of which were associated with nearby driveways. The driveways experiencing the most crashes are north of the intersection at the Chevron driveway and Roth's Glen Creek Crossing driveway. No patterns were identified among the turning collisions at the Wallace Road/Glen Creek Road traffic signal.

The crash history was also reviewed on Doaks Ferry Road along the site frontage. During the five-year period reviewed one crash was reported. It was a fixed object collision that occurred in the dark in the southbound direction. The vehicle hit a ditch or embankment and a utility pole. The collision resulted in possible injury and was attributed to driver fatigue.

A fixed object collision was also reported on Landaggard Dr. This crash occurred in the evening and involved a utility pole. No injuries were reported.

No safety concerns were identified in the study area based on the crash history.

SPIS Sites

The Safety Priority Index System (SPIS) is updated annually by ODOT and is a scoring method used to identify potential safety problems on state highways through a review of crash frequency, crash rate, and crash severity. The top 15% SPIS Groups list for year 2020 was reviewed for Wallace Road (Oregon 221). Table 8 summarizes the findings of the locations identified within the study area.

Table 8. 2020 ODOT SPIS Site in Study Area

Highway	Beginning Milepoint	End Milepoint	Connection	SPIS Percent
Highway 221 150 Salem-Dayton	20.06	20.14	Orchard Heights Rd	85%
Highway 221 150 Salem-Dayton	20.28	20.46	Glen Creek Rd	95%

Intersection Sight Distance

Intersection sight distance was reviewed to ensure an adequate view of conflicting traffic will be provided to drivers at the proposed connection to Doaks Ferry Road. The City of Salem typically applies the minimum recommended sight distance criteria based on the standard reference *A Policy on Geometric Design of Highways and Streets, 7th Edition* published by the American Association of State Highway and Transportation Officials (AASHTO) in 2018 (commonly referred to as the *Green Book*). This reference provides the recommended sight distances as measured from a height of 3.5 feet 14.5 feet from the edge of travel way at the access, based on the speed and width of the roadway.

The proposed new street connection is on the outside of a curve, which provides greater visibility at the intersection. The topography of the Doaks Ferry Road in the vicinity of the access is generally flat. Figure 12 illustrates the sight distance measurements and recommended minimum dimensions for the proposed new street connection.

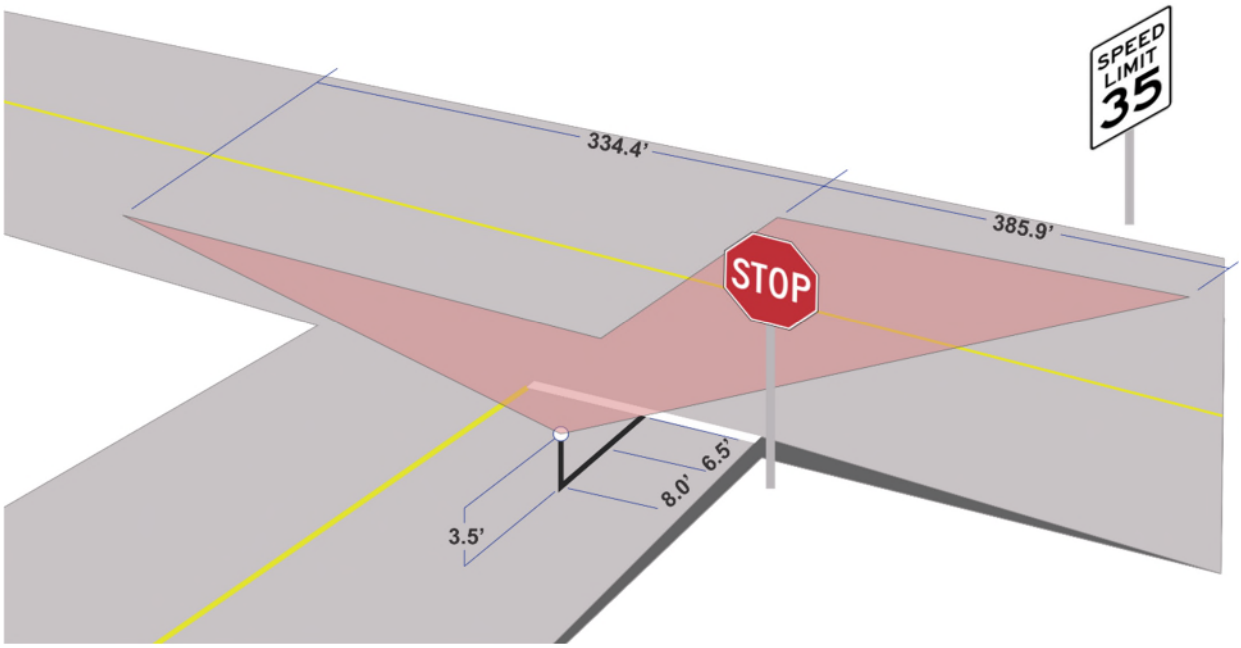


Figure 12. AASHTO minimum recommended intersection sight distance dimensions for Doaks Ferry Road.

The site was visited and inventoried in February 2020. Figures 13 and 14 illustrate the existing sight lines from the proposed street location looking toward the north and south. As shown, the available sight lines are well in excess of the minimum recommended distances cited by AASHTO.

Figure 13. View Facing North from the Proposed Access on Doaks Ferry Road.

Figure 14. View Facing South from the Proposed Access on Doaks Ferry Road.

Analysis Periods

The City requires that the TIA study the year of opening of the development. It is assumed that the site will be fully built out in year 2025. It is anticipated that development will proceed once initiated until full build-out is achieved.

FUTURE YEAR 2025 NO-BUILD TRAFFIC CONDITIONS

Future 2025 no-build traffic conditions identify conditions in the future year that the proposed development will be fully built-out but without the trips associated with the site. This scenario is presented to provide the basis for comparison to "with-site" conditions. This provides an understanding of area transportation needs that are attributable to the proposed development. These conditions consider the regional traffic growth and specific approved developments.

Growth Forecasts

Volume projections from the *Salem River Crossing Project Traffic and Transportation Technical Report Addendum* (*River Crossing*, October 2016) were reviewed on Wallace Road and Orchard Heights Road. This study reports year 2012 existing traffic volumes and forecast year 2040[1] traffic volumes within the study area based on data from the Mid-Willamette Valley Council of Governments (MWVCOG) forecasting

[1] Note that the MPO model extends beyond the planning horizon of the City's adopted Transportation System Plan.

model. This model provides the most current regional travel forecasts on the regional roadways that surround the subject property. Model-based growth reflects planned development of the surrounding area based on the current zoning. Table 9 summarizes segment volumes from the report. As shown in the table, the highest growth is expected on Orchard Heights Road with slightly less growth on Wallace Road.

Based on a review of the projected annual growth between 2012 and the forecast 2040 no build data on Orchard Heights Road and Wallace Road, an annual growth rate of 1.1-percent was applied to the intersections on Wallace Road during the weekday a.m. peak hour and 1.6-percent was applied during the weekday p.m. peak hour. This is an average of the annual growth rates for each study period. Growth is expected to be higher on Orchard Heights Road and Glen Creek Road, for which the River Crossing report provides less detail. For the purposes of this study an annual growth rate of 2-percent was applied to the Doaks Ferry Road intersections for the a.m. and p.m. study periods. This is within the range forecast for Orchard Heights Road west of Wallace Road.

Table 9. Growth Forecasts

Segment	2012 Volumes	2040 Volumes	Average Annual Growth Rate
AM Peak Hour			
Wallace Rd: North of Orchard Heights Rd	1,630	2,410	1.7%
Wallace Rd: South of Orchard Heights Rd	2,020	2,500	0.8%
Wallace Rd: North of Glen Creek Rd	2,090	2,500	0.7%
Wallace Rd: South of Glen Creek Rd	2,500	3,090	0.8%
Orchard Heights Rd: West of Wallace Rd	400	560	1.4%
		Average	**1.1%**
PM Peak Hour			
Wallace Rd: North of Orchard Heights Rd	2,260	2,970	1.1%
Wallace Rd: South of Orchard Heights Rd	2,700	3,700	1.3%
Wallace Rd: North of Glen Creek Rd	2,960	3,970	1.2%
Wallace Rd: South of Glen Creek Rd	3,260	4,990	1.9%
Orchard Heights Rd: West of Wallace Rd	480	790	2.3%
		Average	**1.6%**

In-Process Developments

Based on discussions with the City, there were no specific approved developments that were identified for inclusion in the background volumes beyond the application of background growth.

Figure 15 depicts the estimated resulting traffic volumes for year 2025 during the weekday a.m. and p.m. peak hours. Table 10 depicts the associated traffic operations. As shown in Table 10, with the additional background growth, the Wallace Road/Glen Creek Road is expected to exceed ODOT's target mobility standards during the weekday p.m. peak hour with a v/c ratio of 0.98.

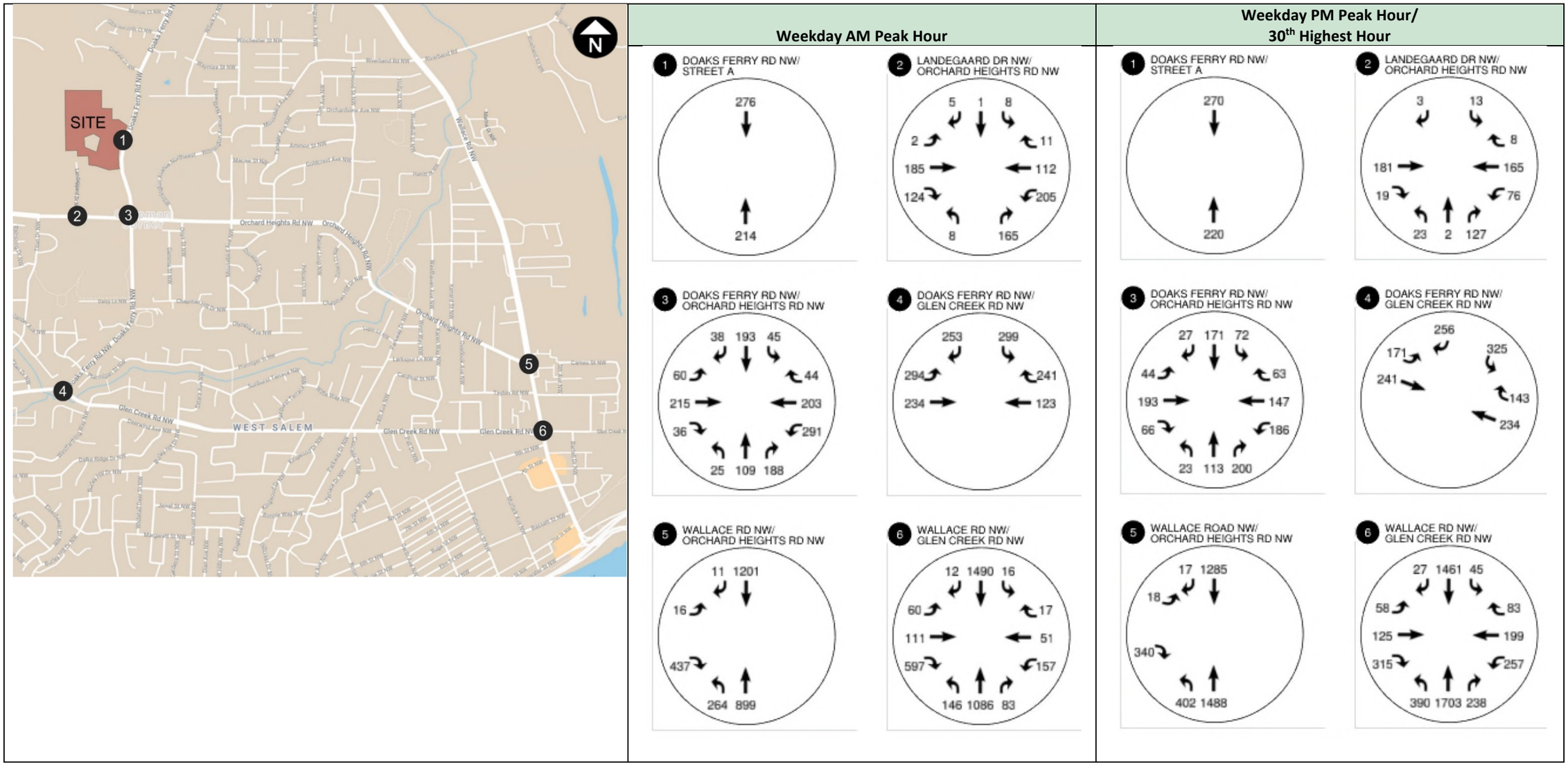


Figure 15. Future Year 2025 No-Build Traffic Volumes, Weekday AM and PM Peak Hour.

Table 10. Summary of 2025 Traffic Conditions

Intersection	Performance Standard	Weekday AM Peak Hour				Weekday PM Peak Hour/30th Highest Hour			
		LOS	Delay (sec)	v/c Ratio	95th % Queue	LOS	Delay (sec)	v/c Ratio	95th % Queue
Year 2025 No-Build Traffic Conditions									
1: Doaks Ferry Rd/ Street A (Access)	LOS E v/c ≤ 0.90								
2: Orchard Heights Rd/ Landaggard Dr NW	LOS E v/c ≤ 0.90	SB LOS E	SB 49.3	SB 0.21	SB: 25 ft WBL: 50 ft NBL: 25 ft NBR: 50 ft	SB LOS D	SB 31.9	SB 0.17	SB: 25 ft WBL: 25 ft NBL: 25 ft NBR: 50 ft
3: Doaks Ferry Rd/ Orchard Heights Rd	LOS E v/c ≤ 0.90	B	19.0	0.68	EB L: 40 ft EB TR: 235 ft WB L: 175 ft WB TR: 175 ft NB L: 30 ft NB TR: 235 ft SB L: 45 ft SB TR: 215 ft	B	19.2	0.62	EB L: 35 ft EB TR: 235 ft WB L: 115 ft WB TR: 155 ft NB L: 25 ft NB TR: 220 ft SB L: 55 ft SB TR: 160 ft
4: Doaks Ferry Rd/ Glen Creek Rd	LOS E v/c ≤ 0.90	B	13.3	0.70	EB L: 115 ft EB T: 95 ft WB TR: 225 ft SB L: 225 ft SB R: 55 ft	B	12.1	0.67	EB L: 75 ft EB T: 110 ft WB TR: 250 ft SB L: 250 ft SB R: 55 ft
5: Wallace Rd/ Orchard Heights Rd	v/c ≤ 0.95	C	28.2	0.82	EB L: 40 ft EB R: 425 ft NB L: 300 ft NB T: 210 ft SB TR: 660 ft	C	29.6	0.82	EB L: 45 ft EB R: 345 ft NB L: 355 ft NB T: 305 ft SB TR: 655 ft
6: Wallace Rd/ Glen Creek Rd	v/c ≤ 0.95	D	41.3	0.91	EB L: 105 ft EB T: 145 ft EB R: 310 ft WB L: 110 ft WB TR: 85 ft NB L: 145 ft NB T: 520 ft NB R: 15 ft SB L: 20 ft SB TR: 935 ft	D	49.2	1.00	EB L: 100 ft EB T: 160 ft EB R: 120 ft WB L: 160 ft WB TR: 315 ft NB L: 305 ft NB T: 1050 ft NB R: 115 ft SB L: 55 ft SB TR: 960 ft
Year 2025 With Project Traffic Conditions									
1: Doaks Ferry Rd/ Street A (Access)	LOS E v/c ≤ 0.90	EB LR: B	EB LR: 11.5	EB LR: 0.17	EB LR: 25 ft	EB LR: B	EB LR: 11.6	EB LR: 0.11	EB LR: 25 ft
2: Orchard Heights Rd/ Landaggard Dr NW	LOS E v/c ≤ 0.90	SB LOS F NB LOS E	SB >100 NB 42.7	SB 0.21 NB 0.15	SB: 150 ft WBL: 50 ft NBL: 25 ft NBR: 50 ft	SB LOS F NB LOS D	SB 54.2 NB 29.8	SB 0.51 NB 0.25	SB: 75 ft WBL: 25 ft NBL: 25 ft NBR: 50 ft
3: Doaks Ferry Rd/ Orchard Heights Rd	LOS E v/c ≤ 0.90	C	22.1	0.73	EB L: 40 ft EB TR: 265 ft WB L: 170 ft WB TR: 190 ft NB L: 35 ft NB TR: 260 ft SB L: 75 ft SB TR: 265 ft	C	21.6	0.69	EB L: 40 ft EB TR: 310 ft WB L: 130 ft WB TR: 220 ft NB L: 35 ft NB TR: 275 ft SB L: 70 ft SB TR: 180 ft
4: Doaks Ferry Rd/ Glen Creek Rd	LOS E v/c ≤ 0.90	B	14.4	0.73	EB L: 140 ft EB T: 105 ft WB TR: 245 ft SB L: 255 ft SB R: 55 ft	B	13.6	0.72	EB L: 95 ft EB T: 120 ft WB TR: 315 ft SB L: 300 ft SB R: 60 ft
5: Wallace Rd/ Orchard Heights Rd	v/c ≤ 0.95	C	35.5	0.86	EB L: 40 ft EB R: 505 ft NB L: 325 ft NB T: 215 ft SB TR: 660 ft	D	38.4	0.85	EB L: 45 ft EB R: 350 ft NB L: 425 ft NB T: 295 ft SB TR: 790 ft
6: Wallace Rd/ Glen Creek Rd	v/c ≤ 0.95	D	46.8	0.96	EB L: 105 ft EB T: 145 ft EB R: 360 ft WB L: 110 ft WB TR: 85 ft NB L: 155 ft NB T: 530 ft NB R: 15 ft SB L: 20 ft SB TR: 975 ft	E	56.7	1.04	EB L: 100 ft EB T: 160 ft EB R: 130 ft WB L: 160 ft WB TR: 315 ft NB L: 340 ft NB T: 1105 ft NB R: 115 ft SB L: 50 ft SB TR: 990 ft

BOLD: Performance standard not met

FUTURE YEAR 2025 WITH PROJECT TRAFFIC CONDITIONS

The 2025 analysis "with project" identifies how the study area's transportation system will operate with the inclusion of the proposed multifamily development. It includes the traffic volumes from the no-build scenario and adds in the site-generated trips. The resulting traffic volumes are shown in Figure 16. Table 10 summarizes the resulting traffic operations.

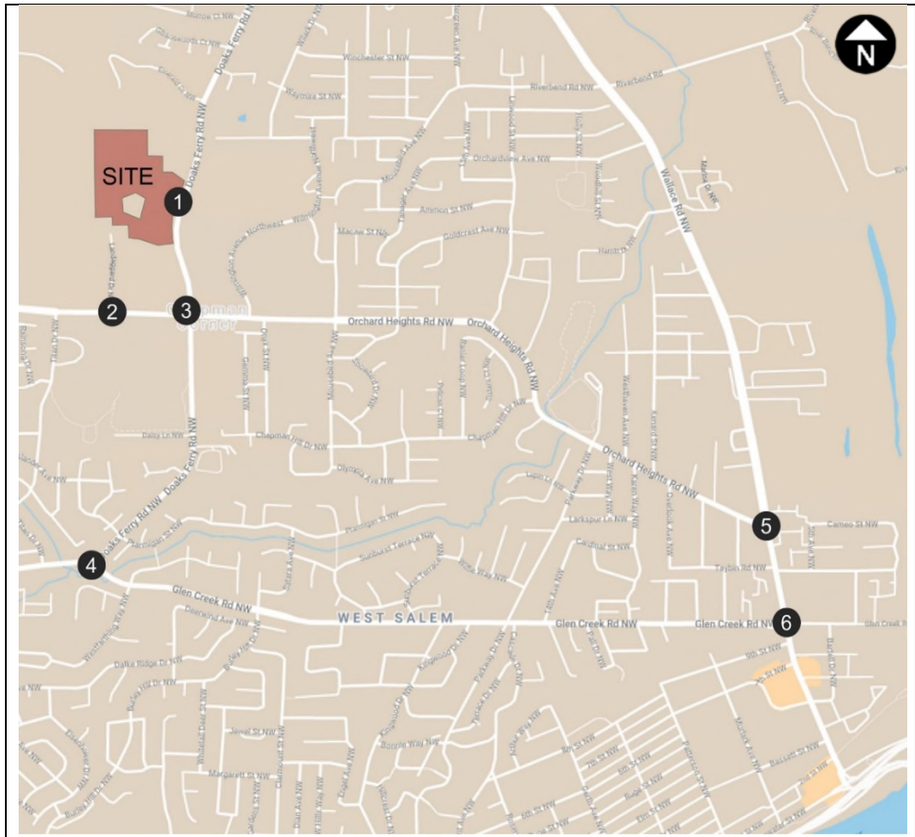
As shown in Table 10, the Wallace Road/Glen Creek Road is expected to exceed ODOT's mobility targets during the weekday p.m. peak hour in 2025 with or without the project. Operations during the morning peak hour are also near the ODOT mobility target. In addition, in the morning peak hour the Landaggard Drive NW intersection with Orchard Heights Road operates at the City standard, and with the connection of the Landaggard collector the intersection will exceed performance thresholds during the morning and afternoon school peak periods. Both of these intersections are further discussed below.

Wallace Road/Glen Creek Road Intersection

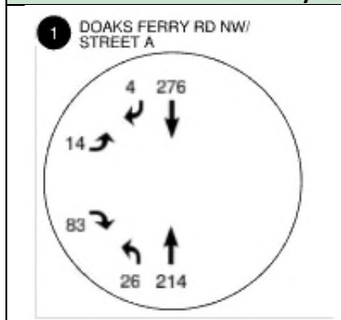
Consistent with recommendations in the City's adopted Transportation System Plan, this intersection was recently improved to include additional turn lanes in 2014 to address capacity problems at the intersection. However, even with these improvements, this intersection operates at a v/c ratio of 0.91 during the weekday p.m. peak hour under existing conditions.

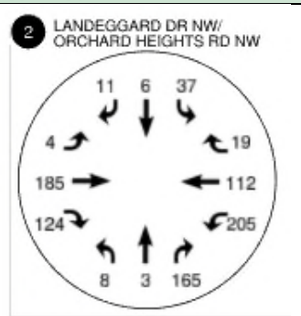
With the intersection widening that has already occurred at this intersection there are limited "minor" improvements that could be considered. Today the northbound through movement is approaching 1,600 vehicles during the weekday p.m. and the southbound through movement is nearly 1,400 vehicles during the weekday a.m. peak hour. Any improvements at this intersection will require additional lanes south of the intersection on Wallace Road continuing onto the Center Street Bridge. With these volumes alternative routes are typically considered to disperse traffic.

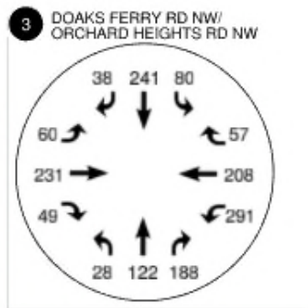
Issues related to West Salem congestion near the Marion Street and Center Street bridges are well known and documented within various transportation plans. The Salem River Crossing Project was tasked with reviewing the potential for a third crossing (effectively a second crossing as the two bridges form a couplet system providing drivers with only one option depending on travel direction) over the Willamette River to help relieve some of the congestion on the connecting roadways, such as Wallace Road. The purpose of the Salem River Crossing Project was to reduce congestion on the two existing bridges crossing the Willamette River and the connecting roads in downtown and West Salem, which includes Wallace Road. The construction of a third river crossing would allow the better dispersion of traffic from its current consolidation with OR 22, but the project was rejected by the City Council to further continue the Environmental Impact Assessment and there are no alternative plans currently in place.

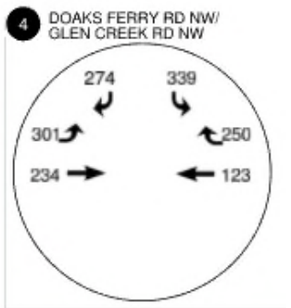


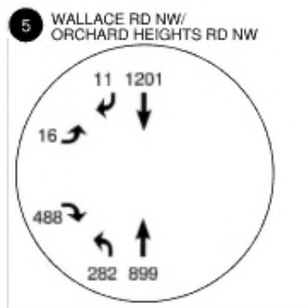
Weekday AM Peak Hour

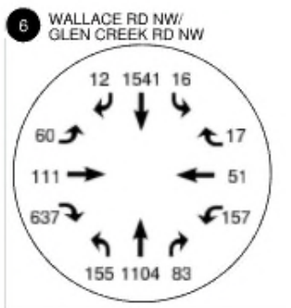




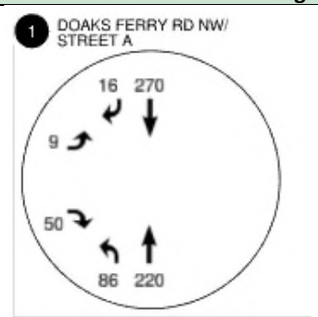


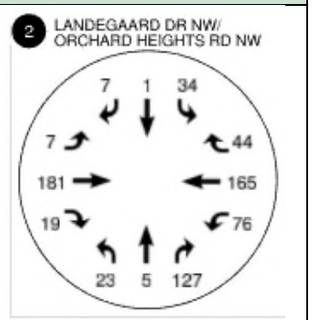


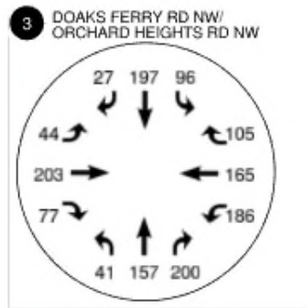


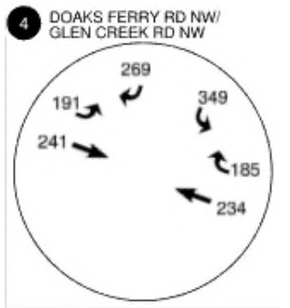


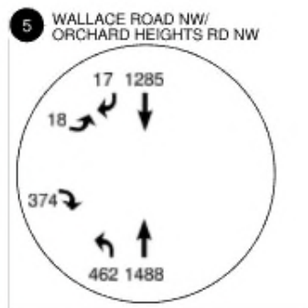
Weekday PM Peak Hour/ 30th Highest Hour











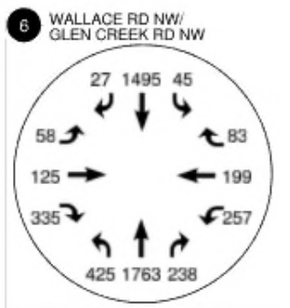


Figure 16. Future Year 2025 With Project Traffic Volumes, Weekday AM and PM Peak Hour.

The City's Transportation System Plan states that "*The major constraint points in the future will be Wallace Road NW and the Willamette River bridges."* The following is also included in the TSP specific to the Wallace Road corridor:

Wallace Road NW (Highway 221)

Wallace Road NW serves as one of the primary routes into the city of Salem, connecting the Willamette River bridges with Dayton and McMinnville. Wallace Road NW is classified as a Major Arterial in the Salem classification system and as a District Highway in the State of Oregon highway system. Most of West Salem's east-west arterials begin at Wallace Road NW, making it the primary north-south route in West Salem. With the majority of traffic heading to or from the Center Street and Marion Street Bridges and the commercial district south of Orchard Heights Road NW, significant congestion occurs on the southern end of Wallace Road NW during peak travel hours.

In 1993 daily traffic volumes on Wallace Road NW ranged from 27,000 north of Edgewater Street NW to 6,800 north of Michigan City Lane NW. By the Year 2005, these traffic volumes had increased to 40,700 and 8,700 respectively. Volumes at the Edgewater location represent a 50 percent increase in the 12-year period.

A major issue concerning Wallace Road NW now and in the future is the ability of the highway, between Orchard Heights Road NW and Edgewater Street NW, to handle the tremendous traffic load expected over the next 20 to 40 years. The Wallace Road Local Access and Circulation Study, adopted by Council in November 1997, identified ways to increase local street circulation, connectivity between properties, consolidating access, and the potential of a collector level street that would parallel Wallace Road NW on the east.

The nearest alternative crossings include the Wheatland Ferry located approximately 12 miles north that is only suitable for moving low levels of vehicles and farming equipment. The River Road crossing located south in Independence is also about 12 miles each way and would provide an unrealistic alternative route for residents of West Salem.

Based on this review it appears that the intersection has been fully built-out and additional capacity improvements are likely limited to system management measures (such as signal timing/detection improvements). Even with additional intersection capacity the existing downstream constraints with the bridges would continue to result in the same levels of congestion. The City has identified mitigation measures that could be implemented to address this congestion but has opted not to proceed with those measures due to trade-offs, and policies adopting revised performance standards have not been adopted.

Orchard Heights Road NW/Landaggard Drive NW

The unsignalized intersection of Landaggard Drive NW with Orchard Heights Road NW occurs in alignment with the entrance to West Salem High School's parking lot. During the morning and afternoon school dismissal periods there are high delays on both the northbound and southbound approaches, and with the addition of site-generated trips to this intersection these delays are substantially increased.

The congested conditions surrounding a school are typical, with the operational results conservatively showing the combined peak residential evening commute trips corresponding with peak school arrival and departure trips. The operational results show conditions during the peak fifteen-minute period when these conditions are most pronounced. Review of the traffic counts shows a substantial peaking between

7:55 a.m. and 8:15 a.m., with traffic volumes outside of this 20-minute period operating with a third of the traffic, as shown in Figure 17.

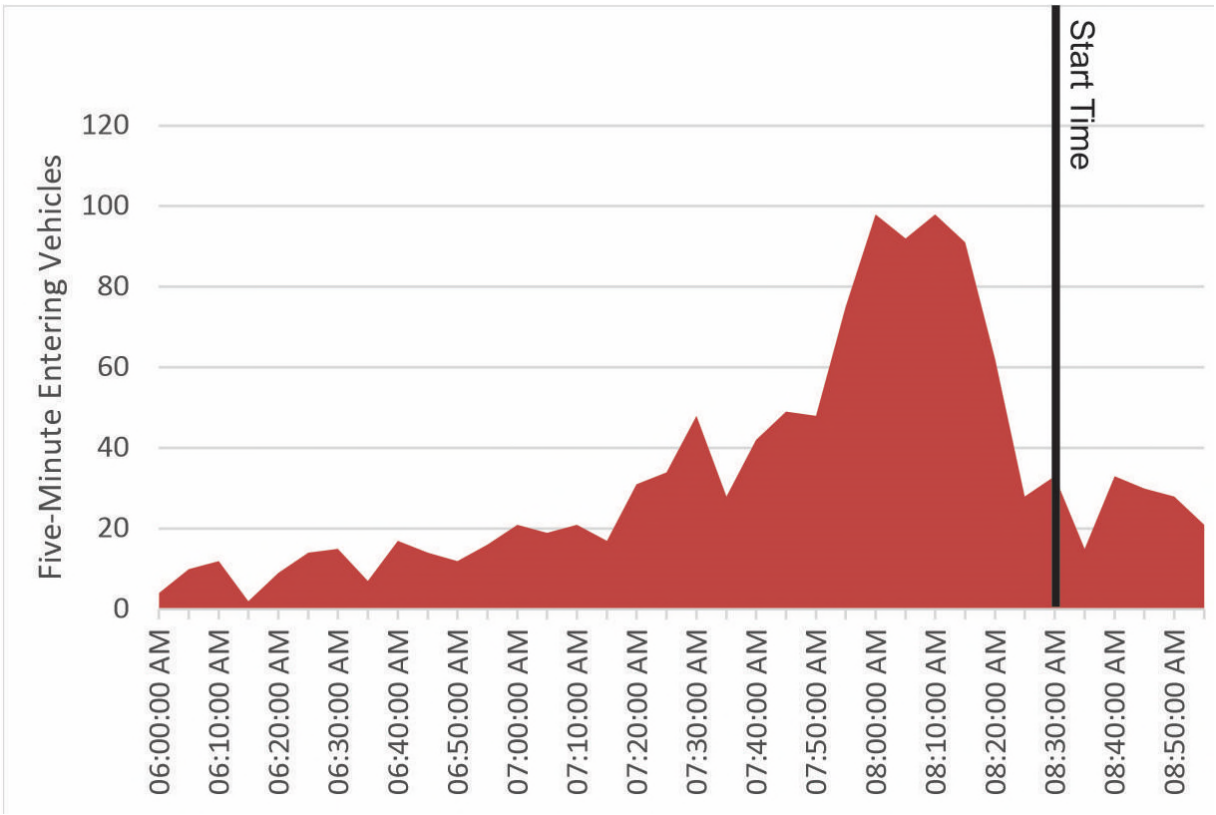


Figure 17. Existing Orchard Heights Rd NW/Landaggard Drive NW five-minute volume profile.

Analysis of the intersection over the course of the peak hour (rather than the peak fifteen-minute period required by the City) shows that the intersection operates well within acceptable performance thresholds during both the morning and evening peak hours, as summarized in Table 11.

Table 11. Hourly Analysis of Orchard Heights Road NW/Landaggard Drive NW (PHF = 1.0)

Intersection	Performance Standard	Weekday AM Peak Hour			
		LOS	Delay (sec)	v/c Ratio	95th % Queue
2: Orchard Heights Rd/ Landaggard Dr NW	LOS E v/c ≤ 0.90	SB LOS D NBL LOS C NBR LOS B	SB 25.6 NBL 20.2 NBR 10.9	SB 0.24 NBL 0.04 NBR 0.21	SB: 25 ft WBL: 25 ft NBL: 25 ft NBR: 25 ft
Intersection	**Performance Standard**	**Weekday PM Peak Hour**			
		LOS	**Delay (sec)**	**v/c Ratio**	**95th % Queue**
2: Orchard Heights Rd/ Landaggard Dr NW	LOS E v/c ≤ 0.90	SB LOS C NBL LOS C NBR LOS B	SB 16.3 NBL 15.4 NBR 10.5	SB 0.12 NBL 0.08 NBR 0.16	SB: 25 ft WBL: 25 ft NBL: 25 ft NBR: 25 ft

With the location of the school entrance within an established school zone, with no record of crashes in the past five years, in alignment with Landaggard Drive NW, and experiencing high pedestrian volumes it is recommended that mitigation for this intersection occur as follows:

- No traffic control changes at Landaggard Drive are recommended due to the proximity of the intersection to the signalized Doaks Ferry Road intersection.
- A raised pedestrian refuge island with a marked pedestrian crossing and accessible ramps (similar to the treatment at Wilmington Avenue NW) is recommended on the west side of the intersection to provide a direct crossing from the Titan Hill site to the school entrance. The installation of this raised pedestrian island will prevent eastbound left-turns from turning onto Landaggard Drive, which is a low-volume movement (2 weekday a.m. peak hour left-turns and 0 weekday p.m. peak hour left-turns within the existing traffic counts). The rerouting of these trips to Doaks Ferry Road will have minimal impact on operations. The addition of a refuge island on this downgrade will improve pedestrian access and safety to the school.

In addition, the operational issues present at this intersection provide further basis for the realignment of the Collector onto Doaks Ferry Road, allowing Landaggard Drive to serve as a local street as currently designed, and a pedestrian school route with the proposed western sidewalk and pedestrian crossing improvements.

TURN LANE WARRANTS

Left-turn and right-turn lane warrants were reviewed at the new 'Street A' access onto Doaks Ferry Road.

Left-Turn Lane Warrants

Turn lane warrants are reviewed based on guidance within the ODOT Transportation Planning and Analysis Unit's publication *Analysis Procedures Manual*. Left-turn lane warrants are based on the posted roadway speed, bidirectional traffic volume, and percentage of the total volume turning left. The left-turn lane warrants are essentially a cost-benefit calculation of the safety benefits provided by separating through and turning traffic versus the construction costs. Left-turn lane warrants do not apply to stop-controlled minor-street approaches. Figure 18 illustrates the left-turn lane warrants for the northbound left-turn movement at the proposed site access on Doaks Ferry Road for the year 2025 traffic volumes with the project during the weekday a.m. and p.m. peak hours.

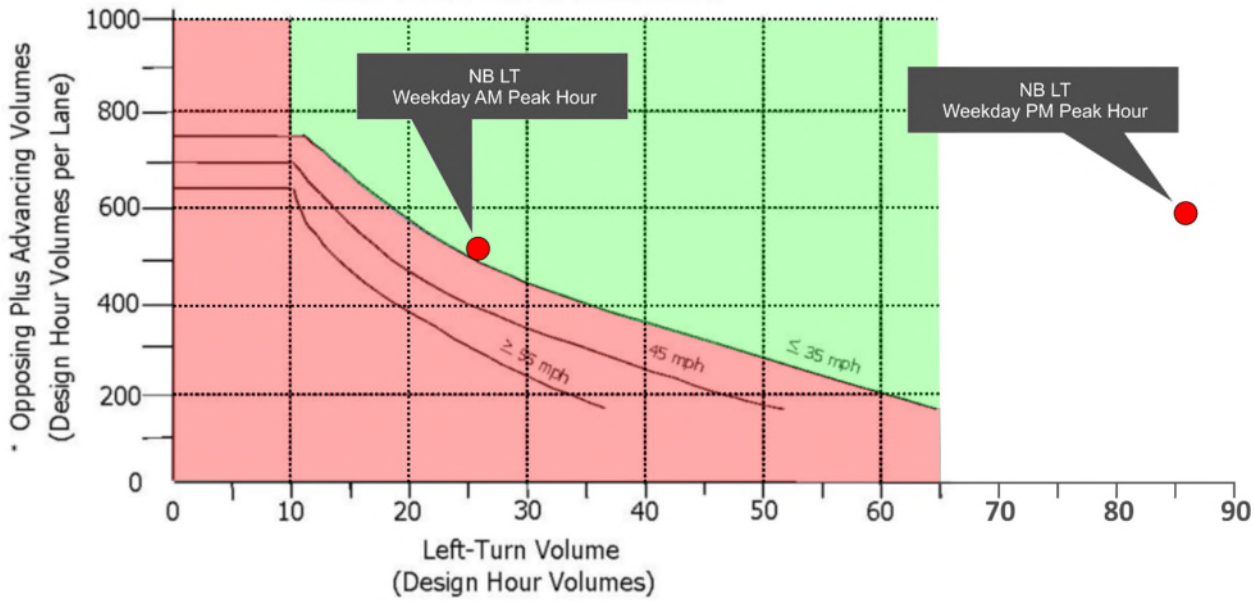


Figure 18. ODOT Left-Turn Lane Warrant Review, Year 2025 With Project, Weekday AM and PM Peak Hour.

As shown in the figure, a left-turn lane is needed to serve the new roadway into the site with approximately 30 percent of site build-out. This is consistent with the planned center turn lanes on Doaks Ferry Road in its improvement to interim *Minor Arterial* standards. For a residential street it is recommended that the improvement include a minimum storage distance of 75 feet.

Right-Turn Lane Warrants

The purpose of a right-turn lane is to improve safety and capacity of a roadway by reducing the speed differential between through vehicles and decelerating vehicles. Right turn lanes are typically reviewed based on the ODOT methodology for rural highways. Doaks Ferry Road is developed to urban standards north of the site near Brush College Road and south of the site south of Orchard Heights Road. Given the urbanizing environment and the very low southbound right-turn volumes expected at the new 'Street A' connection, a right-turn deceleration lane would not be appropriate at this location and further review was not conducted.

PROJECT FRONTAGE IMPROVEMENTS

Doaks Ferry Road is designated as a *Major Arterial* within the City's Transportation System Plan. Although the standard cross-section for a *Major Arterial* is a five-lane section, City's Transportation System Plan has identified the need for upgrading the current cross-section on Doaks Ferry Road to an interim *Minor Arterial* standard in project 82. This is a Committed Project for Doaks Ferry Road from Brush College Road to Orchard Heights Road. The standard cross-section for a minor arterial is provided in Figure 19, and standard local street sections are shown in Figure 20. The City of Salem requires a ¾ street improvements along development frontage and the full completion of internal streets.

Doaks Ferry Road NW (Brush College Road NW to Orchard Heights Road NW) (82)

Funds are identified in the *Capital Improvement Plan* to improve this Major Arterial street to interim Minor Arterial standards.

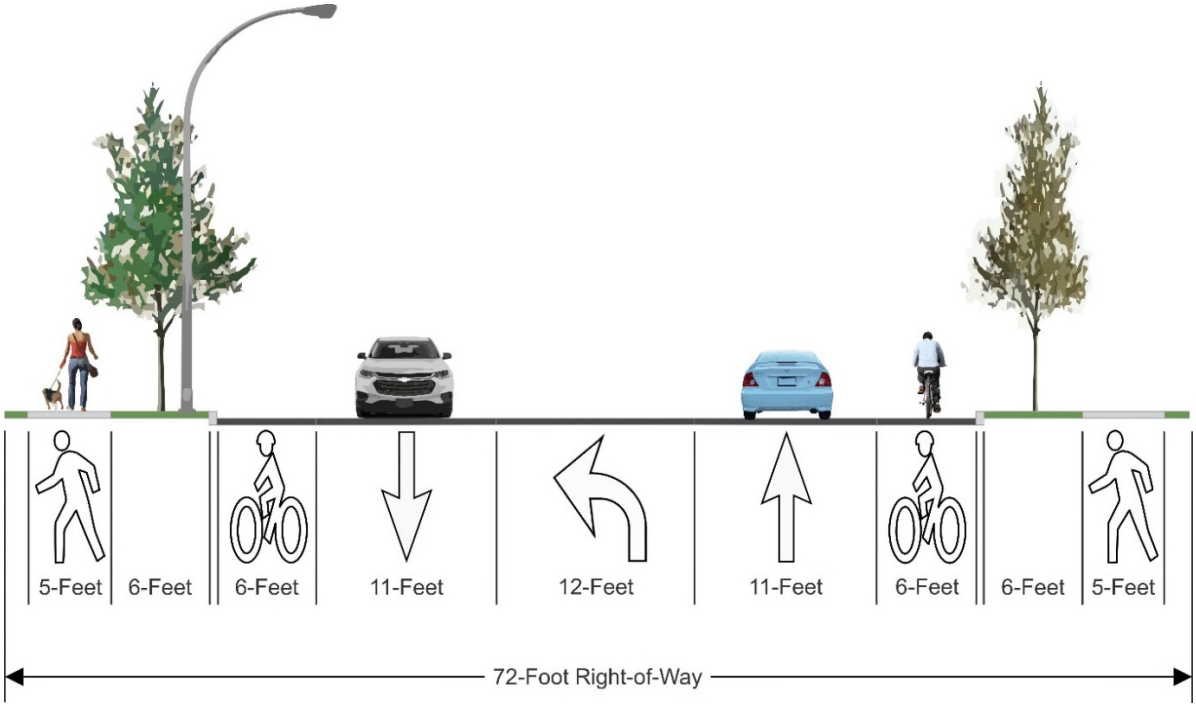


Figure 19. Standard City of Salem *Minor Arterial* Cross-Section.

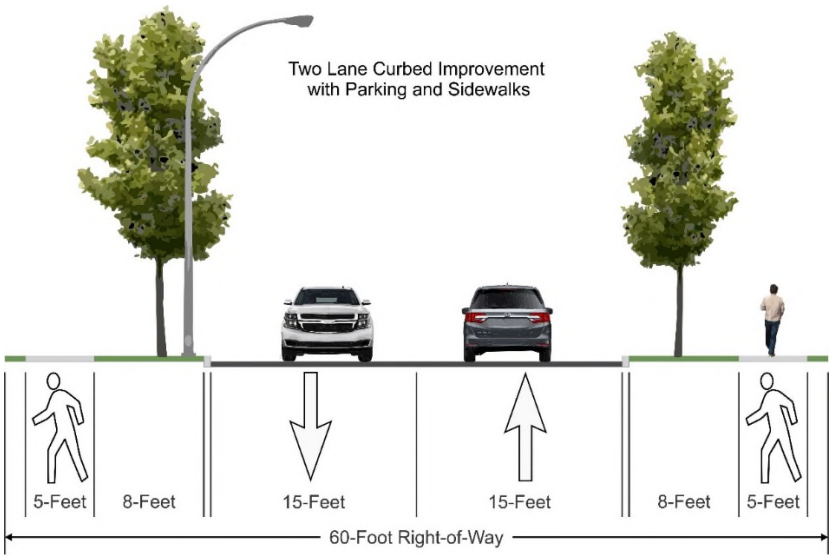


Figure 20. Standard City of Salem Local Street Cross-Section.

LANDAGGARD DRIVE TRAFFIC CALMING REVIEW

As the operational analysis shows, Landaggard Drive NW experiences congestion during the school peak hours as it aligns with the West Salem High School entrance. Minimizing the amount of vehicular traffic along this route is recommended to address this operational deficiency and better support a safer school route. The current design of Landaggard Drive NW would not be suitable as a Collector, as it contains several direct residential driveway accesses along its length with gravel roadside areas that residents park within.

To reduce speeds and traffic volumes it is recommended that the pedestrian refuge island at the Orchard Heights Road NW intersection be constructed to prevent eastbound left-turns onto Landaggard Drive. In addition, installation of a continuous sidewalk on the west side of the street, along with curbing and drainage, will help better define the travel way and reduce the potential for high-speed cut-through trips.

The inclusion of the West Salem High School frontage along Orchard Heights Road NW (extending from west of Titan Drive NW to east of Doaks Ferry Road NW, if not also encompassing the Straub Middle School frontage near Mousebird) will further improve area pedestrian and vehicular safety, providing additional incentive for motorists to use Doaks Ferry Road for commute trips.

SCHOOL CONNECTIVITY

The site of the proposed multifamily development is near West Salem's elementary, middle, and high school. West Salem High School would be most easily accessed via the Landaggard Drive intersection, but field review noted that there are no curb returns or accessible landings in place and there is a crest vertical curve to the west. The City has already installed School Crossing and Pedestrian Crossing signage in advance of the unmarked crossing. While there is no designated pedestrian route along the existing section of Landaggard Street this is the most direct route to the high school. It is recommended that accessible ramps be installed on the northwest intersection quadrant to connect into the sidewalk system into the school. It is also recommended that the crossing of Orchard Heights Road be marked, with crosswalk signage also installed.

Connections to Kalapuya Elementary School or Robert Straub Middle School would be most easily provided with a connection to Orchard Heights Road NW to allow students to cross Doaks Ferry Road at a signalized intersection. With future development of the southern property area frontage improvements will be extended south to Orchard Heights Road. However, it is recommended that this school route occur with the initial project phase to address school connectivity.

TRANSPORTATION SYSTEM PLAN AMENDMENT

A concern noted by our development team, staff, and neighbors at the prior rezone phase of the application was with the City's *Collector* designation of Landaggard Drive NW. This street is currently built to a rural standard, it lacks curbing, sidewalks, and even if it were improved it still provides direct driveway access to the abutting residential properties. Based on the team's preliminary discussions with City staff, it is our understanding that extending new street connections along Landaggard Drive NW and offsite improvements to the road south to Orchard Heights NW will be a requirement of this project. At the prior hearings staff noted support for modifying the *Collector* alignment, extending the higher order street due east to Doaks Ferry Road NW and maintaining Landaggard as a *Local Street*.

Realignment of this higher-order street to connect to Doaks Ferry Road NW will reduce the amount of new trips along Landaggard Drive, which is currently a cul-de-sac serving about 20 homes. It will, however, require an amendment to the City's adopted Transportation System plan to justify the revised alignment and show that the overall system impacts can be appropriately mitigated.

FINDINGS AND RECOMMENDATIONS

This section summarizes findings and recommendations of this transportation study for the proposed Bonaventure Titan Hill multifamily development on Doaks Ferry Road.

- The proposed multifamily development was previously rezoned to Multiple Family Residential 2 (RM2), allowing the proposed apartments as an outright allowable use.
- The existing conditions analysis shows that all of the intersections operate acceptably today, with only marginal reserve capacity at the Glen Creek Road/Wallace Road intersection despite the recent widening improvements.
- There were no safety issues identified within the study area. There are elevated crash rates on Wallace Road where the congestion is occurring.
- Development plans include up to 450 apartments within the northern portion of the site. Trip generation estimates identify that this will create 3,033 new weekday daily trips, including 180 trips during the morning commute period and 230 trips during the evening commute period.
- The level of development proposed is consistent with the 500-unit apartment trip cap assumed within the rezone application.
- Access will be provided from an extension of Landaggard Drive NW and a new connection onto NW Doaks Ferry Road. Adequate intersection sight distance can be provided at the new connection to Doaks Ferry Road.
- If the Landaggard connection is constructed as a *Collector* it will exceed City operational standards during the school peaks, and the adjacent development patterns along the southern portion of the road do not support this higher-order designation. With the operations and high level of pedestrian activity it is recommended that the *Collector* be realigned east along "Street A" to connect to Doaks Ferry Road.
- The design of Landaggard Drive should be downgraded to a Local Street with a functional role of providing a pedestrian school route. To best meet this function the design should include a western sidewalk and curbing to help manage speeds and encourage use of Doaks Ferry Road as the primary access to the multifamily site.
- Without the multiunit residential project the Glen Creek Road/Wallace Road intersection is forecast to exceed its adopted mobility target but remain slightly under its carrying capacity in 2025. With build-out of the development the v/c ratio will increase by 0.04 and exceed capacity. No feasible capacity improvements were identified at the intersection as part of this project to address the congestion associated with the limited bridge connections to West Salem. It is recommended that mitigation for these regional impacts focus on interconnecting the adjacent school and transit routes, enabling these travel modes to better support the new residents as well as the broader surrounding community.
- To help encourage alternative travel modes, a new Cherriots transit stop should be incorporated into the Doaks Ferry Road frontage design to support transit service to the site. Accessible sidewalks should be completed linking this stop with the building entrances.
- Left-turn lanes are warranted on Doaks Ferry Road with approximately 30 percent of site development and will also be required as part of the site frontage requirements. When installed, the left-turn lane should include a minimum storage length of 75 feet.

- Standard frontage improvements should be provided concurrent with development. This will include widening along Doaks Ferry Road (which will support the left-turn lane) and completion of internal streets to the City's *Local Street* standards.
- A complete pedestrian route should be provided from the multifamily site to connect to the nearby elementary and middle schools with initial site development. Ideally this connection would occur south along the Doaks Ferry Road frontage. The sidewalks should extend to the Orchard Heights Road/Doaks Ferry Road intersection to access the crossings at the signalized intersection to connect to the middle and elementary schools.
- A connection to the high school should also be provided with initial site development. This should include new accessible ramps on the northwest corner of Orchard Heights Road/Landaggard Drive along with a marked pedestrian crossing and supporting school crossing signage. A raised pedestrian refuge on the west side of the intersection (to align with the school entrance and retain the more critical westbound left-turn lane) could help improve the safety and visibility of this crossing, requiring that the low volume of eastbound left-turns access the neighborhoods to the north from Doaks Ferry Road.
- Given the current and future school-related activity in the area, a school zone is recommended along Orchard Heights Road encompassing the high school (and middle school) frontage. Discussions with the school district and City should occur to identify whether this should be provided as a time of day treatment (e.g., 7AM to 5PM) or other more limited strategies.
- The development should contribute toward regional improvements through payment of the City's Transportation System Development Charges.

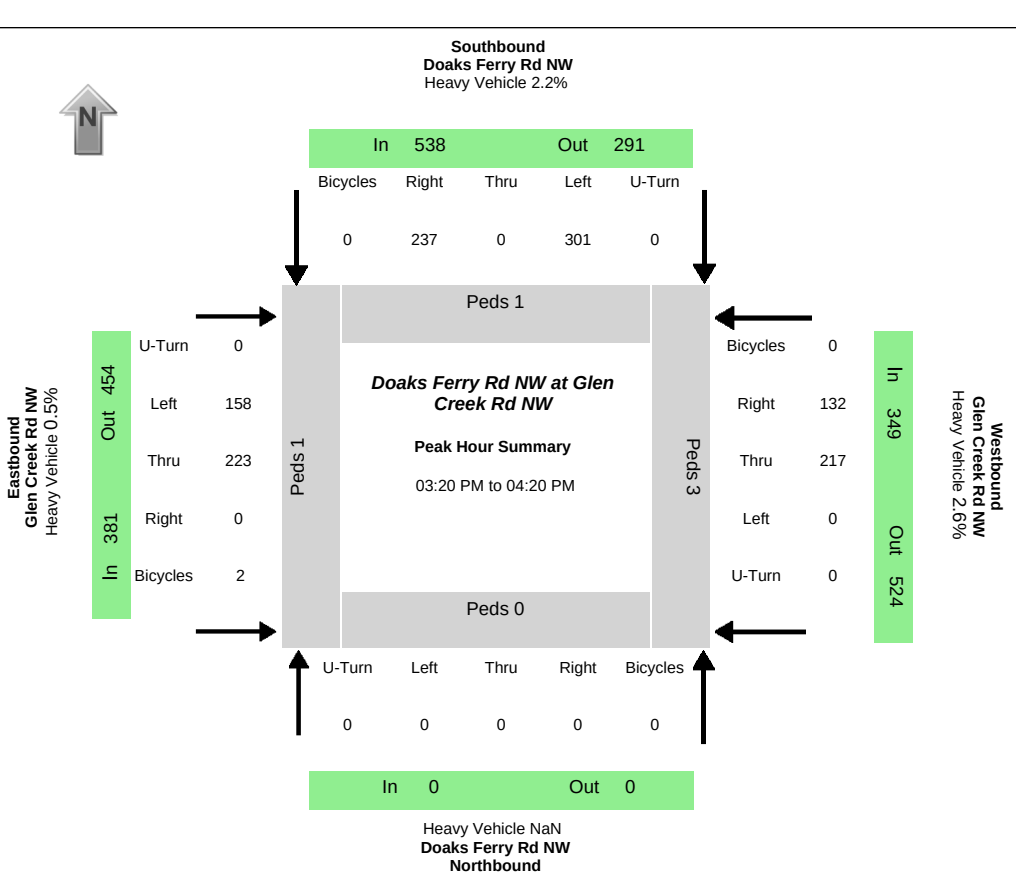
Please let me know if you have any questions or comments on this Transportation impact Analysis at (503) 997-4473 or via email at joe@transightconsulting.com.

Attachments:

- Traffic Count Worksheets
- Crash Summary Sheets
- Existing Conditions LOS Worksheets
- Year 2025 No-Build Conditions LOS Worksheets
- Year 2025 "With Project" Conditions LOS Worksheets
- ODOT Critical Movement Analysis Worksheets
- Hourly Landaggard Drive Traffic Operations Worksheets

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Doaks Ferry Rd NW*
E/W street	*Glen Creek Rd NW*
City, State	Salem OR
Site Notes	
Location	44.95208 - -123.08433
Start Date	Thursday, September 16, 2021
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	03:20:00 PM
Peak 15 Min Start	03:30:00 PM
PHF (15-Min Int)	0.91



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	0	0	0	301	0	237	0	158	223	0	0	0	217	132	0	0	538	381	349	0	290	454	524

Percent Heavy Vehicles

0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	2.1%	0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	2.8%	2.3%	0.0%	NaN	2.2%	0.5%	2.6%	NaN	1.0%	2.4%	1.7%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**
0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2

PHV - Pedestrians

in Crosswalk				
NB	SB	EB	WB	**Sum**
0	1	1	3	5

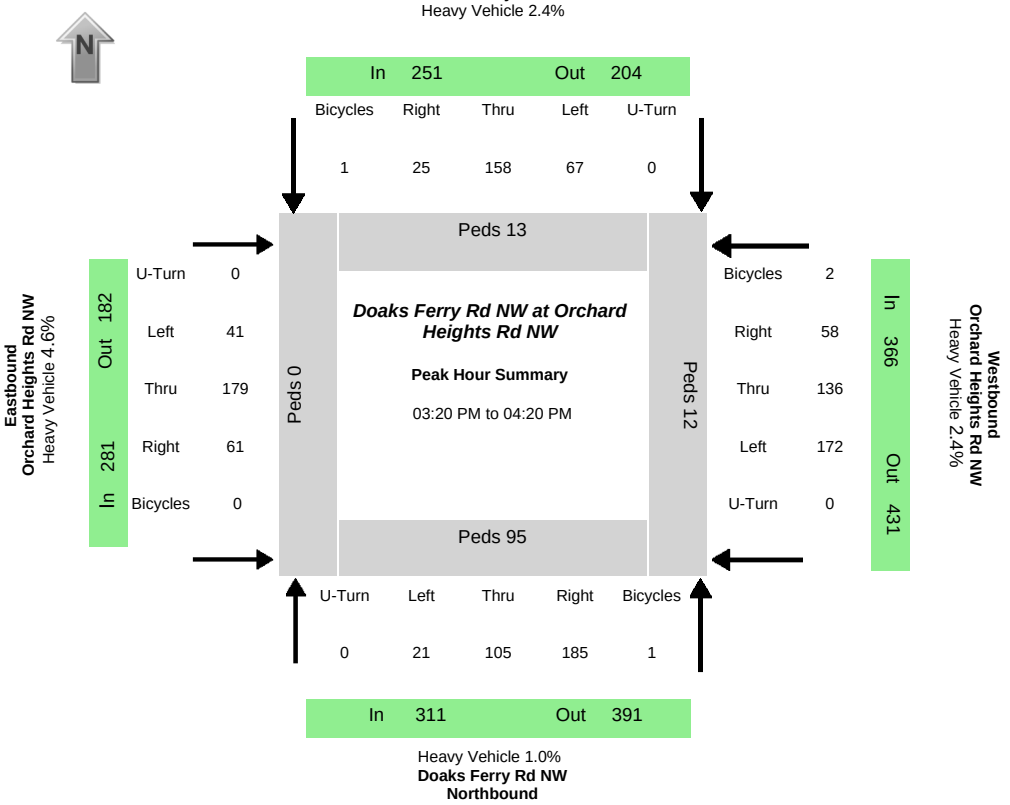
All Vehicle Volumes

	Northbound Doaks Ferry Rd NW				Southbound Doaks Ferry Rd NW				Eastbound Glen Creek Rd NW				Westbound Glen Creek Rd NW				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	0	0	0	0	6	0	8	0	9	14	0	0	0	10	13	0		
02:05:00 PM	0	0	0	0	5	0	4	0	20	15	0	0	0	15	15	0		
02:10:00 PM	0	0	0	0	9	0	3	0	17	16	0	0	0	16	9	0	204	
02:15:00 PM	0	0	0	0	11	0	6	0	13	9	0	0	0	14	9	0	206	
02:20:00 PM	0	0	0	0	7	0	11	0	14	11	0	0	0	11	6	0	192	
02:25:00 PM	0	0	0	0	19	0	23	0	4	11	0	0	0	9	10	0	198	
02:30:00 PM	0	0	0	0	21	0	30	0	10	12	0	0	0	12	13	0	234	
02:35:00 PM	0	0	0	0	15	0	15	0	5	13	0	0	0	16	10	0	248	
02:40:00 PM	0	0	0	0	11	0	12	0	8	18	0	0	0	11	6	0	238	
02:45:00 PM	0	0	0	0	16	0	8	0	13	10	0	0	0	14	7	0	208	
02:50:00 PM	0	0	0	0	7	0	8	0	16	12	0	0	0	14	15	0	206	
02:55:00 PM	0	0	0	0	4	0	10	0	10	9	0	0	0	9	16	0	198	838
03:00:00 PM	0	0	0	0	7	0	5	0	9	14	0	0	0	12	13	0	190	838
03:05:00 PM	0	0	0	0	6	0	13	0	15	13	0	0	0	23	18	0	206	852
03:10:00 PM	0	0	0	0	10	0	10	0	15	5	0	0	0	18	21	0	227	861
03:15:00 PM	0	0	0	0	13	0	6	0	14	19	0	0	0	13	13	0	245	877
03:20:00 PM	0	0	0	0	26	0	10	0	10	22	0	0	0	15	7	0	247	907
03:25:00 PM	0	0	0	0	24	0	26	0	12	14	0	0	0	22	10	0	276	939
03:30:00 PM	0	0	0	0	39	0	17	0	17	19	0	0	0	18	8	0	316	959
03:35:00 PM	0	0	0	0	32	0	16	0	15	19	0	0	0	18	10	0	336	995
03:40:00 PM	0	0	0	0	33	0	34	0	16	15	0	0	0	16	8	0	350	1051
03:45:00 PM	0	0	0	0	29	0	20	0	10	25	0	0	0	18	13	0	347	1098
03:50:00 PM	0	0	0	0	12	0	18	0	16	18	0	0	0	19	21	0	341	1130
03:55:00 PM	0	0	0	0	15	0	11	0	12	17	0	0	0	11	15	0	300	1153

04:00:00 PM	0	0	0	0	16	0	11	0	11	23	0	0	0	16	17	0	279	1187
04:05:00 PM	0	0	0	0	23	0	32	0	12	11	0	0	0	28	4	0	285	1209
04:10:00 PM	0	0	0	0	28	0	25	0	11	22	0	0	0	17	8	0	315	1241
04:15:00 PM	0	0	0	0	24	0	17	0	16	18	0	0	0	19	11	0	326	1268
04:20:00 PM	0	0	0	0	16	0	13	0	10	19	0	0	0	21	10	0	305	1267
04:25:00 PM	0	0	0	0	15	0	11	0	11	9	0	0	0	17	14	0	271	1236
04:30:00 PM	0	0	0	0	13	0	5	0	8	20	0	0	0	15	13	0	240	1192
04:35:00 PM	0	0	0	0	16	0	11	0	8	19	0	0	0	20	13	0	238	1169
04:40:00 PM	0	0	0	0	16	0	11	0	10	14	0	0	0	16	13	0	241	1127
04:45:00 PM	0	0	0	0	21	0	17	0	13	21	0	0	0	22	7	0	268	1113
04:50:00 PM	0	0	0	0	11	0	8	0	14	15	0	0	0	19	9	0	257	1085
04:55:00 PM	0	0	0	0	12	0	6	0	15	17	0	0	0	12	6	0	245	1072
05:00:00 PM	0	0	0	0	7	0	11	0	14	18	0	0	0	25	8	0	227	1061
05:05:00 PM	0	0	0	0	14	0	12	0	9	18	0	0	0	17	10	0	231	1031
05:10:00 PM	0	0	0	0	12	0	10	0	11	9	0	0	0	24	9	0	238	995
05:15:00 PM	0	0	0	0	20	0	7	0	14	9	0	0	0	14	8	0	227	962
05:20:00 PM	0	0	0	0	12	0	8	0	19	11	0	0	0	17	22	0	236	962
05:25:00 PM	0	0	0	0	11	0	8	0	16	18	0	0	0	15	13	0	242	966
05:30:00 PM	0	0	0	0	12	0	8	0	14	12	0	0	0	14	18	0	248	970
05:35:00 PM	0	0	0	0	20	0	6	0	10	10	0	0	0	16	21	0	242	966
05:40:00 PM	0	0	0	0	9	0	9	0	19	13	0	0	0	9	23	0	243	968
05:45:00 PM	0	0	0	0	17	0	11	0	20	8	0	0	0	22	13	0	256	958
05:50:00 PM	0	0	0	0	14	0	7	0	25	10	0	0	0	10	11	0	250	959
05:55:00 PM	0	0	0	0	8	0	12	0	15	20	0	0	0	30	21	0	274	997

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Doaks Ferry Rd NW*
E/W street	*Orchard Heights Rd NW*
City, State	Salem OR
Site Notes	
Location	44.96044 - -123.07966
Start Date	Thursday, September 16, 2021
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	03:20:00 PM
Peak 15 Min Start	03:30:00 PM
PHF (15-Min Int)	0.88



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
21	105	185	0	67	158	25	0	41	179	61	0	172	136	58	0	311	250	281	366	391	204	182	431

Percent Heavy Vehicles

0.0%	1.0%	1.1%	0.0%	6.0%	0.6%	4.0%	0.0%	7.3%	3.4%	6.6%	0.0%	1.7%	4.4%	0.0%	0.0%	1.0%	2.4%	4.6%	2.5%	2.0%	2.0%	3.8%	2.8%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**
0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	4

PHV - Pedestrians

in Crosswalk				
NB	SB	EB	WB	**Sum**
95	13	0	12	120

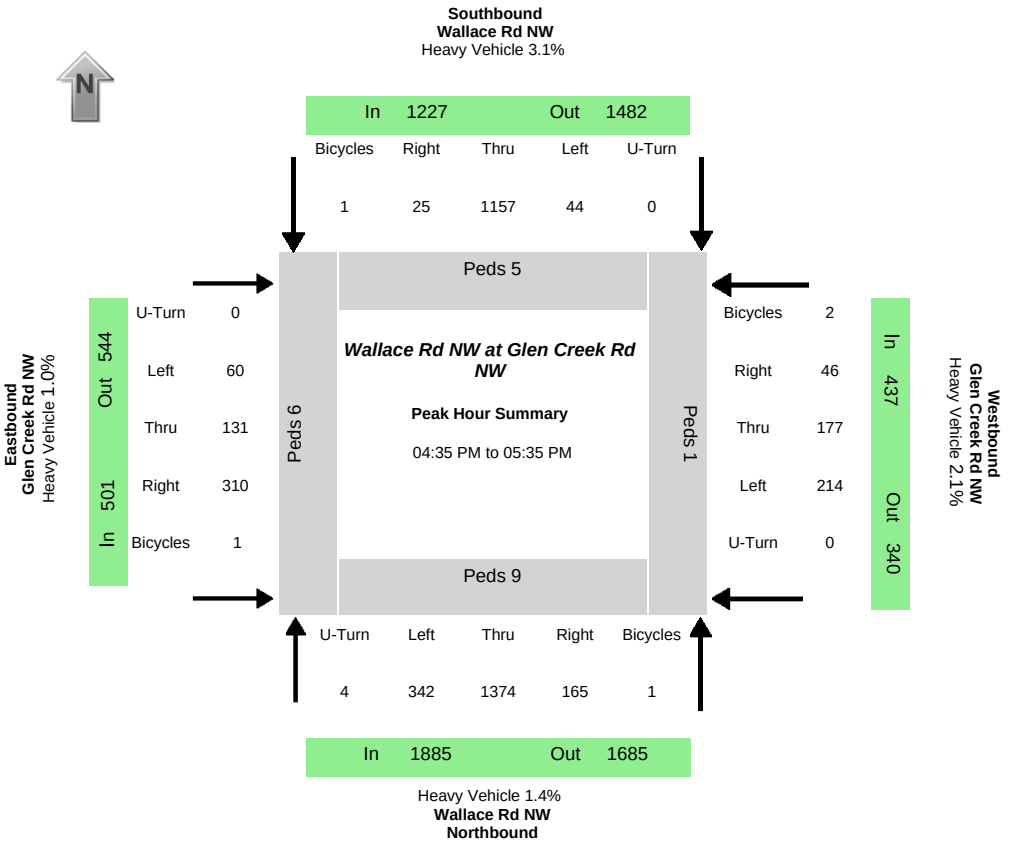
All Vehicle Volumes

	Northbound Doaks Ferry Rd NW				Southbound Doaks Ferry Rd NW				Eastbound Orchard Heights Rd NW				Westbound Orchard Heights Rd NW				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	1	6	10	0	1	5	0	0	0	9	2	0	4	4	1	0		
02:05:00 PM	0	6	12	0	1	5	0	0	1	10	1	0	4	5	1	0		
02:10:00 PM	1	5	9	0	2	6	1	0	2	12	0	0	3	10	5	0	145	
02:15:00 PM	1	10	17	0	3	3	2	0	2	11	6	0	3	3	0	0	163	
02:20:00 PM	0	6	6	0	4	8	0	0	3	7	1	0	4	4	4	0	164	
02:25:00 PM	1	7	9	0	1	3	0	0	1	5	1	0	26	13	5	0	180	
02:30:00 PM	0	11	8	0	3	4	1	0	3	3	1	0	32	17	1	0	203	
02:35:00 PM	2	6	6	0	3	4	0	0	0	9	0	0	23	7	6	0	222	
02:40:00 PM	1	8	5	0	4	8	2	0	2	5	3	0	13	7	3	0	211	
02:45:00 PM	1	6	2	0	1	8	1	0	3	10	1	0	12	3	2	0	177	
02:50:00 PM	1	6	13	0	3	7	2	0	1	8	1	0	5	9	4	0	171	
02:55:00 PM	1	8	6	0	2	3	1	0	1	7	2	0	10	10	1	0	162	698
03:00:00 PM	2	11	3	0	3	5	3	0	2	6	0	0	3	17	3	0	170	713
03:05:00 PM	4	8	4	0	1	8	0	0	1	10	3	0	15	7	2	0	173	730
03:10:00 PM	1	10	11	0	0	8	4	0	2	10	2	0	11	22	3	0	205	758
03:15:00 PM	5	10	6	0	5	19	3	0	1	2	0	0	13	14	0	0	225	775
03:20:00 PM	3	6	10	0	4	15	1	0	4	12	3	0	8	21	2	0	251	817
03:25:00 PM	0	5	6	0	3	26	4	0	6	25	11	0	11	12	3	0	279	857
03:30:00 PM	0	6	12	0	5	14	3	0	8	25	11	0	6	8	3	0	302	874
03:35:00 PM	6	16	18	0	4	10	1	0	8	19	9	0	9	12	7	0	332	927
03:40:00 PM	1	17	30	0	4	15	3	0	5	19	10	0	12	6	2	0	344	990
03:45:00 PM	1	5	23	0	5	10	1	0	1	19	3	0	19	8	1	0	339	1036
03:50:00 PM	2	9	16	0	10	7	2	0	0	8	4	0	12	6	2	0	298	1054
03:55:00 PM	3	7	22	0	13	9	5	0	1	14	2	0	9	9	3	0	271	1099

04:00:00 PM	2	14	10	0	7	10	1	0	4	10	0	0	12	4	5	0	254	1120
04:05:00 PM	2	3	13	0	6	19	1	0	2	13	4	0	22	17	9	0	287	1168
04:10:00 PM	0	9	9	0	2	15	3	0	1	12	1	0	29	23	15	0	309	1203
04:15:00 PM	1	8	16	0	4	8	0	0	1	3	3	0	23	10	6	0	313	1208
04:20:00 PM	2	12	8	0	4	8	3	0	0	5	2	0	13	7	6	0	272	1189
04:25:00 PM	0	13	4	0	5	14	1	0	1	4	0	0	6	7	2	0	210	1134
04:30:00 PM	1	8	3	0	5	7	2	0	5	8	1	0	4	6	3	0	180	1086
04:35:00 PM	4	8	8	0	2	15	2	0	2	4	1	0	8	9	3	0	176	1033
04:40:00 PM	0	8	5	0	3	11	1	0	2	8	2	0	4	9	4	0	176	966
04:45:00 PM	1	9	4	0	6	21	1	0	2	4	0	0	5	9	1	0	186	933
04:50:00 PM	2	10	4	0	1	9	1	0	8	4	3	0	7	9	4	0	182	917
04:55:00 PM	2	13	6	0	4	5	3	0	1	7	3	0	5	10	1	0	185	880
05:00:00 PM	0	8	2	0	3	10	4	0	2	6	0	0	5	13	1	0	176	855
05:05:00 PM	1	12	5	0	1	16	2	0	1	6	2	0	4	5	0	0	169	799
05:10:00 PM	0	8	6	0	0	10	3	0	1	18	0	0	9	9	3	0	176	747
05:15:00 PM	3	9	3	0	3	17	1	0	1	5	1	0	6	10	5	0	186	728
05:20:00 PM	1	17	9	0	6	9	1	0	4	4	2	0	6	14	5	0	209	736
05:25:00 PM	0	14	12	0	2	7	3	0	1	2	2	0	8	10	2	0	205	742
05:30:00 PM	1	13	6	0	4	10	2	0	2	4	0	0	4	10	1	0	198	746
05:35:00 PM	1	12	4	0	3	18	4	0	2	7	1	0	3	13	8	0	196	756
05:40:00 PM	2	9	4	0	5	12	0	0	1	10	1	0	10	12	1	0	200	766
05:45:00 PM	1	8	8	0	5	18	3	0	2	8	1	0	6	15	2	0	220	780
05:50:00 PM	2	17	12	0	5	11	9	0	0	6	2	0	7	22	4	0	241	815
05:55:00 PM	1	9	7	0	3	10	3	0	4	4	2	0	4	15	4	0	240	821

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Wallace Rd NW*
E/W street	*Glen Creek Rd NW*
City, State	Salem OR
Site Notes	
Location	44.95009 - -123.05165
Start Date	Thursday, September 16, 2021
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:35:00 PM
Peak 15 Min Start	04:35:00 PM
PHF (15-Min Int)	0.98



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
342	1374	165	4	44	1157	25	0	60	131	310	0	214	177	46	0	1885	1226	501	437	1685	1480	544	340

Percent Heavy Vehicles

1.2%	1.5%	1.2%	0.0%	0.0%	3.3%	0.0%	0.0%	0.0%	0.0%	1.6%	0.0%	2.8%	1.1%	2.2%	0.0%	1.4%	3.1%	1.0%	2.1%	2.9%	1.4%	1.1%	0.6%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**
0	1	0	0	0	1	0	0	0	1	0	0	0	1	1	0	5

PHV - Pedestrians

in Crosswalk				
NB	SB	EB	WB	**Sum**
9	5	6	1	21

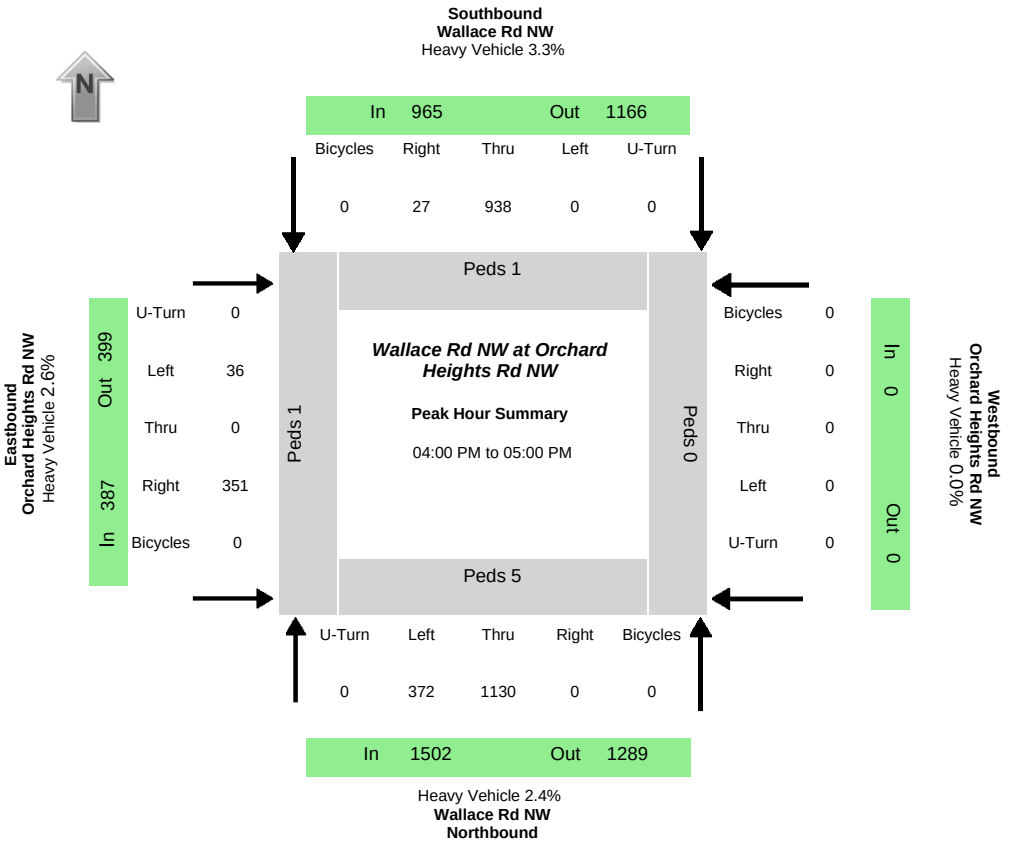
All Vehicle Volumes

	Northbound Wallace Rd NW				Southbound Wallace Rd NW				Eastbound Glen Creek Rd NW				Westbound Glen Creek Rd NW				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	21	70	17	0	3	59	2	0	3	16	31	1	32	11	5	0		
02:05:00 PM	15	96	15	0	5	103	3	0	2	12	24	1	26	17	9	0		
02:10:00 PM	24	109	11	0	3	78	1	0	5	7	15	0	23	13	2	0	890	
02:15:00 PM	20	100	15	0	3	69	3	0	3	6	24	0	18	15	7	0	902	
02:20:00 PM	24	84	17	0	7	69	1	0	6	5	17	1	27	8	1	0	841	
02:25:00 PM	14	111	16	0	5	109	1	0	4	15	12	0	11	8	4	0	860	
02:30:00 PM	28	90	15	0	6	87	3	0	4	8	38	1	14	8	4	0	883	
02:35:00 PM	26	78	13	0	1	93	4	0	9	17	24	1	24	18	10	0	934	
02:40:00 PM	19	100	8	0	3	112	1	0	4	5	21	0	20	10	1	0	928	
02:45:00 PM	25	79	12	0	2	94	1	0	5	8	45	1	18	8	1	0	921	
02:50:00 PM	33	84	18	0	3	70	5	0	6	10	25	1	22	16	6	0	902	
02:55:00 PM	18	108	19	0	5	105	3	0	4	6	20	0	22	5	8	0	921	3599
03:00:00 PM	24	87	17	0	3	77	1	0	4	3	21	0	19	12	2	0	892	3598
03:05:00 PM	34	98	13	0	2	67	0	0	5	14	17	0	15	11	5	0	874	3551
03:10:00 PM	30	98	14	0	10	88	1	0	5	4	19	0	23	14	7	0	864	3573
03:15:00 PM	23	141	11	0	4	113	2	0	3	4	21	0	12	10	2	0	940	3636
03:20:00 PM	35	115	15	0	2	74	2	0	2	8	30	0	14	10	3	0	969	3679
03:25:00 PM	24	86	19	1	2	93	5	0	6	4	33	0	15	13	11	0	968	3681
03:30:00 PM	16	106	11	0	2	115	5	0	8	10	26	0	17	9	3	0	950	3703
03:35:00 PM	39	110	12	0	7	75	2	0	4	8	30	0	24	15	0	0	966	3711
03:40:00 PM	24	101	13	0	3	78	1	0	10	5	30	0	23	16	11	0	969	3722
03:45:00 PM	27	105	16	0	6	111	0	0	8	10	29	0	14	18	2	0	987	3769
03:50:00 PM	35	141	15	0	4	101	1	0	7	9	25	0	15	9	8	0	1031	3840
03:55:00 PM	23	99	11	0	2	85	2	0	7	21	16	0	21	19	3	0	1025	3826

04:00:00 PM	24	103	21	0	4	99	2	0	2	7	28	0	22	14	4	0	1009	3886
04:05:00 PM	31	112	12	0	4	105	1	0	7	11	32	0	10	20	7	0	991	3957
04:10:00 PM	22	103	20	0	4	83	3	0	5	15	34	0	21	11	3	0	1006	3968
04:15:00 PM	28	95	15	0	7	67	1	0	7	8	25	0	26	21	7	0	983	3929
04:20:00 PM	22	124	15	0	1	111	5	0	5	8	27	0	18	10	4	0	981	3969
04:25:00 PM	26	111	16	0	2	79	1	0	4	13	39	0	15	15	5	0	983	3983
04:30:00 PM	20	94	14	0	9	96	5	0	4	8	23	0	21	10	4	0	984	3963
04:35:00 PM	22	124	18	0	6	113	4	0	5	6	25	0	14	16	5	0	992	3995
04:40:00 PM	30	126	18	1	1	88	2	0	7	12	33	0	19	20	4	0	1027	4041
04:45:00 PM	26	91	14	1	2	83	1	0	6	19	20	0	22	21	3	0	1028	4004
04:50:00 PM	14	126	11	0	4	108	4	0	5	12	26	0	15	5	8	0	1008	3972
04:55:00 PM	44	135	12	1	2	95	2	0	5	11	31	0	13	10	2	0	1010	4026
05:00:00 PM	27	99	13	0	5	87	3	0	4	17	23	0	21	23	4	0	1027	4022
05:05:00 PM	28	100	17	0	4	103	0	0	7	9	21	0	23	15	2	0	1018	3999
05:10:00 PM	40	126	13	0	1	93	3	0	1	5	30	0	21	14	3	0	1005	4025
05:15:00 PM	28	113	18	0	2	81	2	0	6	12	32	0	15	14	2	0	1004	4043
05:20:00 PM	17	98	7	1	6	93	1	0	2	9	25	0	29	19	7	0	989	4007
05:25:00 PM	29	121	11	0	6	115	0	0	3	8	16	0	9	9	3	0	969	4011
05:30:00 PM	37	115	13	0	5	98	3	0	9	11	28	0	13	11	3	0	990	4049
05:35:00 PM	25	95	17	0	6	96	1	0	6	14	25	0	27	18	3	0	1009	4024
05:40:00 PM	29	111	11	0	3	85	1	0	6	7	16	0	16	15	3	0	982	3966
05:45:00 PM	34	119	19	0	2	89	3	0	5	11	21	1	18	6	4	0	968	3989
05:50:00 PM	26	112	18	0	5	82	1	0	5	10	33	1	9	22	1	0	960	3976
05:55:00 PM	23	110	18	0	2	92	5	0	2	16	13	0	13	16	1	0	968	3924

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Wallace Rd NW*
E/W street	*Orchard Heights Rd NW*
City, State	Salem OR
Site Notes	
Location	44.95334 - -123.05251
Start Date	Thursday, September 16, 2021
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:00:00 PM
Peak 15 Min Start	04:45:00 PM
PHF (15-Min Int)	0.97



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
372	1130	0	0	0	938	27	0	36	0	351	0	0	0	0	0	1502	965	387	0	1289	1166	399	0

Percent Heavy Vehicles

1.6%	2.7%	0.0%	0.0%	0.0%	3.3%	3.7%	0.0%	2.8%	0.0%	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	3.3%	2.6%	0.0%	3.1%	2.7%	1.8%	0.0%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PHV - Pedestrians

in Crosswalk				
NB	SB	EB	WB	**Sum**
5	1	1	0	7

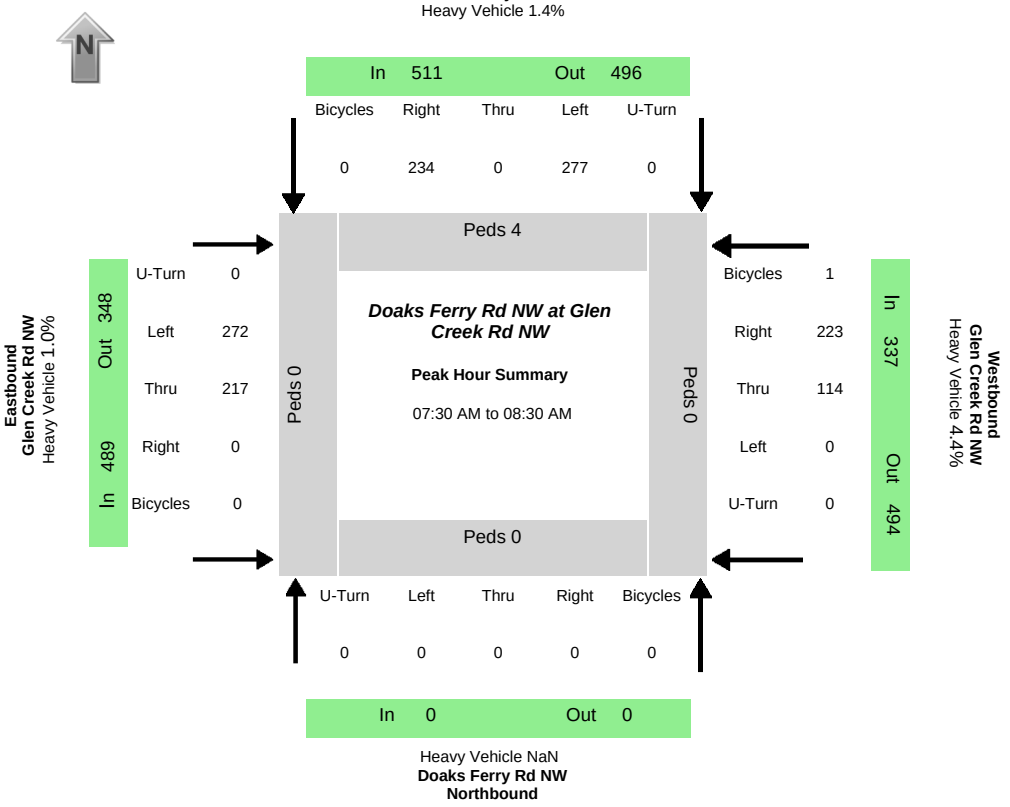
All Vehicle Volumes

	Northbound Wallace Rd NW				Southbound Wallace Rd NW				Eastbound Orchard Heights Rd NW				Westbound Orchard Heights Rd NW				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	23	50	0	0	0	65	4	0	2	0	21	0	0	0	0	0		
02:05:00 PM	47	77	0	0	0	55	2	0	1	0	28	0	0	0	0	0		
02:10:00 PM	35	65	0	0	0	65	0	0	2	0	24	0	0	0	0	0	566	
02:15:00 PM	33	71	0	0	0	61	1	0	3	0	25	0	0	0	0	0	595	
02:20:00 PM	21	74	0	0	0	60	3	0	0	0	29	0	0	0	0	0	572	
02:25:00 PM	25	79	0	0	0	86	1	0	0	0	23	0	0	0	0	0	595	
02:30:00 PM	24	73	0	0	0	86	0	0	2	0	39	0	0	0	0	0	625	
02:35:00 PM	28	84	0	0	0	80	0	0	0	0	36	0	0	0	0	0	666	
02:40:00 PM	21	86	0	0	0	74	2	0	0	0	43	0	0	0	0	0	678	
02:45:00 PM	21	70	0	0	0	74	1	0	1	0	26	0	0	0	0	0	647	
02:50:00 PM	29	68	0	0	0	60	2	0	4	0	35	0	0	0	0	0	617	
02:55:00 PM	30	88	0	0	0	43	1	1	1	0	24	0	0	0	0	0	579	2418
03:00:00 PM	27	74	0	0	0	69	1	0	1	0	28	0	0	0	0	0	586	2453
03:05:00 PM	23	69	0	0	0	82	2	0	0	0	26	0	0	0	0	0	590	2445
03:10:00 PM	40	96	0	0	0	74	3	0	1	0	24	0	0	0	0	0	640	2492
03:15:00 PM	36	86	0	0	0	65	1	0	2	0	25	0	0	0	0	0	655	2513
03:20:00 PM	28	90	0	0	0	110	1	0	0	0	11	0	0	0	0	0	693	2566
03:25:00 PM	22	82	0	0	0	83	1	0	3	0	31	0	0	0	0	0	677	2574
03:30:00 PM	44	77	0	0	0	67	5	0	3	0	31	0	0	0	0	0	689	2577
03:35:00 PM	26	82	0	0	0	75	1	0	3	0	39	0	0	0	0	0	675	2575
03:40:00 PM	27	105	0	0	0	87	2	0	3	0	30	0	0	0	0	0	707	2603
03:45:00 PM	41	86	0	0	0	61	3	0	3	0	43	0	0	0	0	0	717	2647
03:50:00 PM	28	93	0	0	0	73	0	0	3	0	27	0	0	0	0	0	715	2673
03:55:00 PM	24	82	0	0	0	103	3	0	0	0	19	0	0	0	0	0	692	2716

04:00:00 PM	35	90	0	0	0	75	9	0	0	0	30	0	0	0	0	0	694	2755
04:05:00 PM	31	82	0	0	0	86	2	0	5	0	30	0	0	0	0	0	706	2789
04:10:00 PM	33	83	0	0	0	74	1	0	4	0	31	0	0	0	0	0	701	2777
04:15:00 PM	26	99	0	0	0	58	1	0	9	0	39	0	0	0	0	0	694	2794
04:20:00 PM	32	100	0	0	0	59	2	0	3	0	36	0	0	0	0	0	690	2786
04:25:00 PM	34	76	0	0	0	92	2	0	0	0	22	0	0	0	0	0	690	2790
04:30:00 PM	28	91	0	0	0	94	6	0	0	0	17	0	0	0	0	0	694	2799
04:35:00 PM	30	108	0	0	0	78	1	0	1	0	29	0	0	0	0	0	709	2820
04:40:00 PM	26	95	0	0	0	76	0	0	6	0	43	0	0	0	0	0	729	2812
04:45:00 PM	29	83	0	0	0	72	1	0	5	0	25	0	0	0	0	0	708	2790
04:50:00 PM	45	118	0	0	0	75	0	0	0	0	31	0	0	0	0	0	730	2835
04:55:00 PM	23	105	0	0	0	99	2	0	3	0	18	0	0	0	0	0	734	2854
05:00:00 PM	43	79	0	0	0	88	2	0	0	0	20	0	0	0	0	0	751	2847
05:05:00 PM	26	95	0	0	0	77	2	0	2	0	24	0	0	0	0	0	708	2837
05:10:00 PM	31	91	0	0	0	69	1	0	2	0	35	0	0	0	0	0	687	2840
05:15:00 PM	37	83	0	0	0	70	0	0	0	0	22	0	0	0	0	0	667	2820
05:20:00 PM	23	104	0	0	0	91	2	0	2	0	25	0	0	0	0	0	688	2835
05:25:00 PM	27	87	0	0	0	89	1	0	0	0	16	0	0	0	0	0	679	2829
05:30:00 PM	33	90	0	0	0	96	5	0	2	0	15	0	0	0	0	0	708	2834
05:35:00 PM	41	93	0	0	0	86	2	0	2	0	23	0	0	0	0	0	708	2834
05:40:00 PM	41	84	0	0	0	72	2	0	0	0	32	0	0	0	0	0	719	2819
05:45:00 PM	29	77	0	0	0	67	2	0	3	0	38	0	0	0	0	0	694	2820
05:50:00 PM	44	89	0	0	0	73	1	0	1	0	24	0	0	0	0	0	679	2783
05:55:00 PM	38	90	0	0	0	74	2	0	5	0	24	0	0	0	0	0	681	2766

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Doaks Ferry Rd NW*
E/W street	*Glen Creek Rd NW*
City, State	Salem OR
Site Notes	
Location	44.95208 - -123.08433
Start Date	Thursday, September 16, 2021
Start Time	06:00:00 AM
Weather	
Study ID #	
Peak Hour Start	07:30:00 AM
Peak 15 Min Start	08:00:00 AM
PHF (15-Min Int)	0.92



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	0	0	0	277	0	234	0	272	217	0	0	0	114	223	0	0	511	489	337	0	495	348	494

Percent Heavy Vehicles

0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	1.3%	0.0%	0.7%	1.4%	0.0%	0.0%	0.0%	7.9%	2.7%	0.0%	NaN	1.4%	1.0%	4.5%	NaN	1.6%	3.4%	1.4%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1

PHV - Pedestrians

in Crosswalk				
NB	SB	EB	WB	Sum
0	4	0	0	4

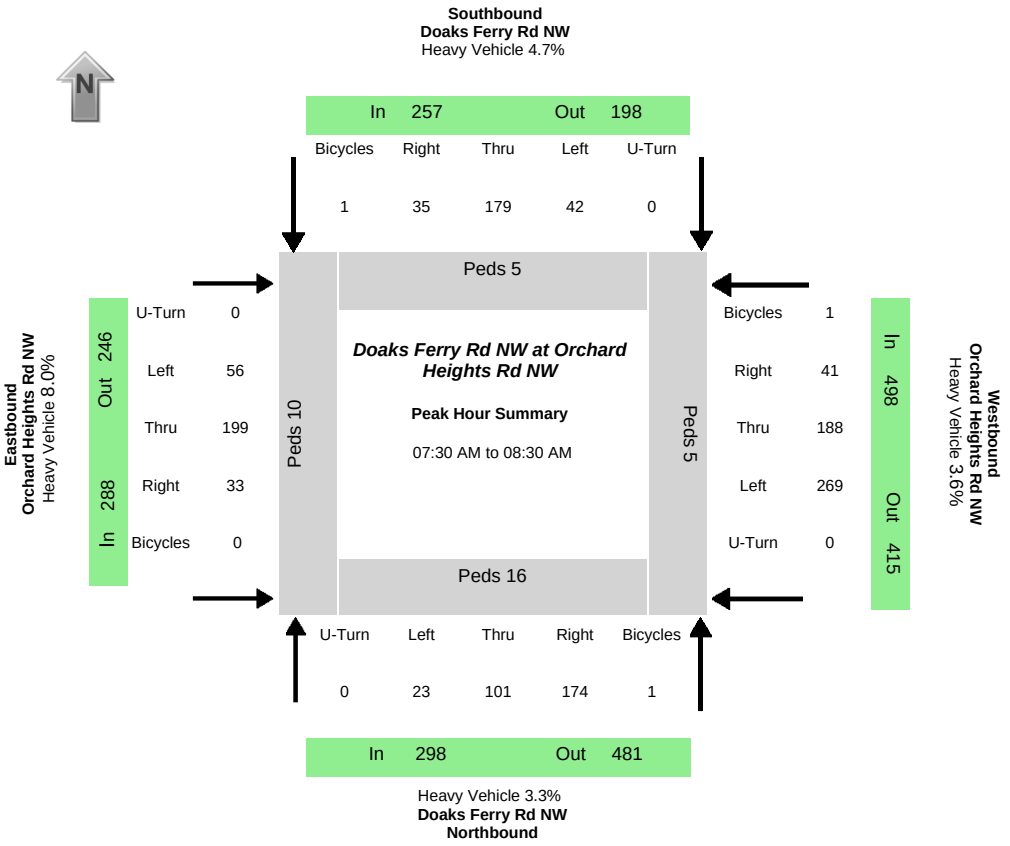
All Vehicle Volumes

	Northbound Doaks Ferry Rd NW				Southbound Doaks Ferry Rd NW				Eastbound Glen Creek Rd NW				Westbound Glen Creek Rd NW				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
06:00:00 AM	0	0	0	0	2	0	2	0	0	10	0	0	0	3	0	0		
06:05:00 AM	0	0	0	0	1	0	4	0	1	9	0	0	0	3	1	0		
06:10:00 AM	0	0	0	0	3	0	5	0	2	4	0	0	0	3	1	0	54	
06:15:00 AM	0	0	0	0	1	0	4	0	2	12	0	0	0	0	3	0	59	
06:20:00 AM	0	0	0	0	4	0	3	0	3	5	0	0	0	1	3	0	59	
06:25:00 AM	0	0	0	0	1	0	4	0	5	10	0	0	0	0	3	0	64	
06:30:00 AM	0	0	0	0	5	0	5	0	4	12	0	0	0	5	2	0	75	
06:35:00 AM	0	0	0	0	4	0	4	0	3	16	0	0	0	7	1	0	91	
06:40:00 AM	0	0	0	0	5	0	3	0	2	10	0	0	0	6	3	0	97	
06:45:00 AM	0	0	0	0	4	0	7	0	6	11	0	0	0	5	2	0	99	
06:50:00 AM	0	0	0	0	7	0	8	0	6	13	0	0	0	9	1	0	108	
06:55:00 AM	0	0	0	0	3	0	3	0	9	23	0	0	0	8	6	0	131	346
07:00:00 AM	0	0	0	0	2	0	11	0	14	16	0	0	0	8	3	0	150	383
07:05:00 AM	0	0	0	0	13	0	14	0	11	11	0	0	0	6	8	0	169	427
07:10:00 AM	0	0	0	0	11	0	13	0	9	17	0	0	0	5	11	0	183	475
07:15:00 AM	0	0	0	0	9	0	14	0	12	18	0	0	0	9	8	0	199	523
07:20:00 AM	0	0	0	0	11	0	10	0	22	15	0	0	0	9	4	0	207	575
07:25:00 AM	0	0	0	0	8	0	8	0	28	11	0	0	0	6	9	0	211	622
07:30:00 AM	0	0	0	0	10	0	14	0	41	19	0	0	0	6	18	0	249	697
07:35:00 AM	0	0	0	0	13	0	14	0	33	21	0	0	0	7	21	0	287	771
07:40:00 AM	0	0	0	0	20	0	20	0	44	15	0	0	0	6	22	0	344	869
07:45:00 AM	0	0	0	0	25	0	37	0	14	18	0	0	0	5	9	0	344	942
07:50:00 AM	0	0	0	0	15	0	32	0	20	17	0	0	0	15	16	0	350	1013
07:55:00 AM	0	0	0	0	22	0	21	0	18	14	0	0	0	16	17	0	331	1069

08:00:00 AM	0	0	0	0	22	0	20	0	22	16	0	0	0	13	20	0	336	1128
08:05:00 AM	0	0	0	0	35	0	11	0	30	17	0	0	0	7	24	0	345	1189
08:10:00 AM	0	0	0	0	27	0	20	0	23	13	0	0	0	16	29	0	365	1251
08:15:00 AM	0	0	0	0	32	0	16	0	10	20	0	0	0	8	26	0	364	1293
08:20:00 AM	0	0	0	0	22	0	14	0	9	22	0	0	0	14	13	0	334	1316
08:25:00 AM	0	0	0	0	34	0	15	0	8	25	0	0	0	1	8	0	297	1337
08:30:00 AM	0	0	0	0	27	0	11	0	6	22	0	0	0	11	5	0	267	1311
08:35:00 AM	0	0	0	0	14	0	7	0	11	16	0	0	0	10	7	0	238	1267
08:40:00 AM	0	0	0	0	9	0	5	0	10	15	0	0	0	12	13	0	211	1204
08:45:00 AM	0	0	0	0	11	0	7	0	10	20	0	0	0	15	12	0	204	1171
08:50:00 AM	0	0	0	0	14	0	8	0	9	15	0	0	0	11	5	0	201	1118
08:55:00 AM	0	0	0	0	14	0	6	0	5	16	0	0	0	8	7	0	193	1066

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Doaks Ferry Rd NW*
E/W street	*Orchard Heights Rd NW*
City, State	Salem OR
Site Notes	
Location	44.96044 - -123.07966
Start Date	Thursday, September 16, 2021
Start Time	06:00:00 AM
Weather	
Study ID #	
Peak Hour Start	07:30:00 AM
Peak 15 Min Start	08:05:00 AM
PHF (15-Min Int)	0.87



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
23	101	174	0	42	179	35	0	56	199	33	0	269	188	41	0	298	256	288	498	481	198	246	415

Percent Heavy Vehicles

8.7%	5.9%	1.1%	0.0%	11.9%	0.6%	17.1%	0.0%	10.7%	6.0%	15.2%	0.0%	3.0%	5.3%	0.0%	0.0%	3.4%	4.7%	8.0%	3.6%	2.9%	6.1%	7.3%	4.6%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum
0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	3

PHV - Pedestrians

in Crosswalk				
NB	SB	EB	WB	Sum
16	5	10	5	36

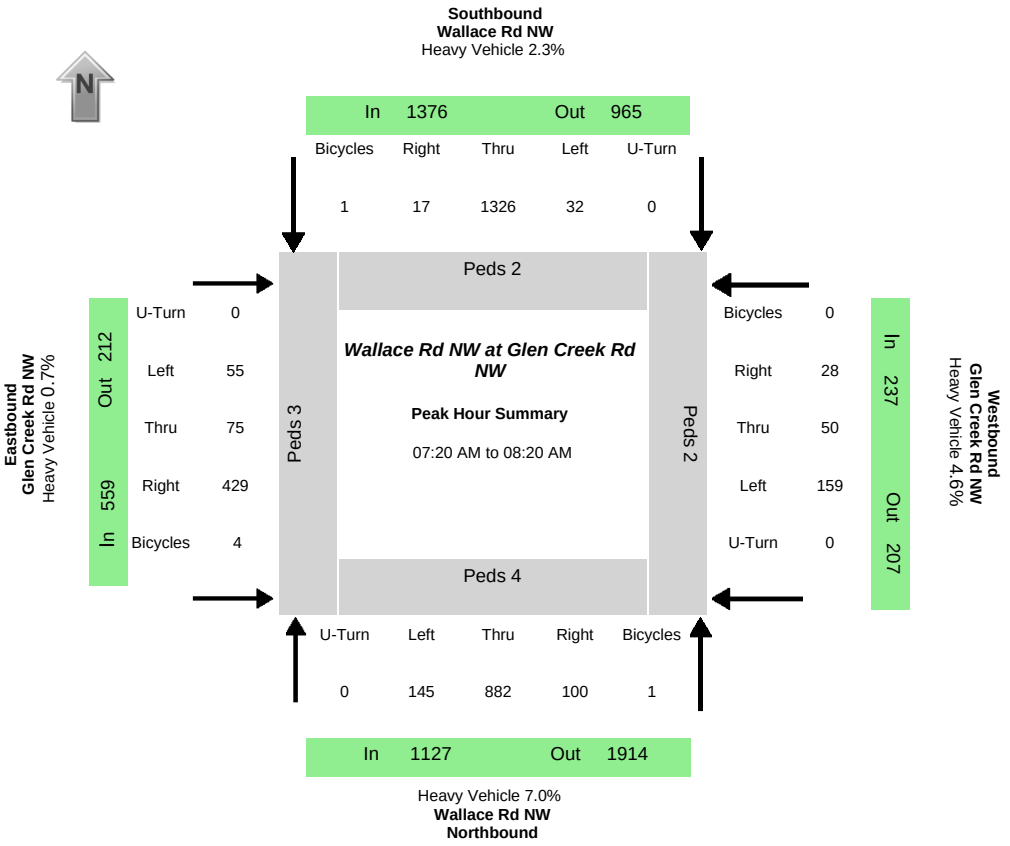
All Vehicle Volumes

	Northbound Doaks Ferry Rd NW				Southbound Doaks Ferry Rd NW				Eastbound Orchard Heights Rd NW				Westbound Orchard Heights Rd NW				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
06:00:00 AM	0	1	0	0	1	1	0	0	1	1	0	0	2	0	0	0		
06:05:00 AM	0	2	0	0	0	0	0	0	1	3	1	0	4	1	1	0		
06:10:00 AM	0	5	0	0	0	4	0	0	0	3	1	0	1	3	0	0	37	
06:15:00 AM	0	2	1	0	2	5	0	0	0	2	0	0	1	2	0	0	45	
06:20:00 AM	0	9	0	0	0	3	0	0	2	1	0	0	2	3	3	0	55	
06:25:00 AM	0	1	1	0	1	2	0	0	0	3	0	0	1	0	1	0	48	
06:30:00 AM	0	4	2	0	1	2	1	0	0	1	2	0	2	2	1	0	51	
06:35:00 AM	0	2	2	0	2	4	1	0	0	3	0	0	1	4	0	0	47	
06:40:00 AM	0	2	1	0	3	4	0	0	0	6	0	0	2	0	0	0	55	
06:45:00 AM	0	4	2	0	1	3	1	0	1	10	1	0	5	4	2	0	71	
06:50:00 AM	0	8	1	0	1	3	0	0	1	4	1	0	7	6	3	0	87	
06:55:00 AM	0	5	3	0	2	3	3	0	1	7	2	0	2	5	1	0	103	243
07:00:00 AM	0	3	9	0	3	9	0	0	2	13	0	0	5	5	4	0	122	289
07:05:00 AM	1	6	9	0	1	7	2	0	2	6	1	0	7	3	3	0	135	324
07:10:00 AM	0	4	13	0	6	8	0	0	2	7	1	0	14	3	3	0	162	368
07:15:00 AM	0	11	9	0	3	9	0	0	1	15	0	0	11	3	3	0	174	418
07:20:00 AM	0	4	7	0	3	5	0	0	2	6	3	0	12	8	4	0	180	449
07:25:00 AM	0	7	16	0	4	6	0	0	0	7	3	0	11	5	4	0	182	502
07:30:00 AM	0	10	24	0	2	11	0	0	3	20	0	0	11	6	4	0	208	575
07:35:00 AM	1	17	25	0	3	11	2	0	7	13	4	0	20	18	4	0	279	681
07:40:00 AM	3	11	27	0	4	6	2	0	2	24	2	0	28	12	6	0	343	790
07:45:00 AM	1	10	28	0	5	7	2	0	7	12	1	0	35	21	4	0	385	889
07:50:00 AM	0	9	11	0	3	12	0	0	2	10	0	0	30	18	5	0	360	954
07:55:00 AM	1	4	11	0	4	11	4	0	2	7	2	0	23	17	2	0	321	1008

08:00:00 AM	0	9	17	0	10	8	1	0	3	14	2	0	10	9	4	0	275	1042
08:05:00 AM	1	4	6	0	4	19	4	0	4	17	4	0	23	27	4	0	292	1111
08:10:00 AM	2	10	9	0	4	22	7	0	5	18	5	0	33	15	1	0	335	1181
08:15:00 AM	6	5	8	0	1	29	3	0	10	27	6	0	21	20	3	0	387	1255
08:20:00 AM	5	5	6	0	2	32	5	0	4	13	4	0	21	14	1	0	382	1313
08:25:00 AM	3	7	2	0	0	11	5	0	7	24	3	0	14	11	3	0	341	1340
08:30:00 AM	2	8	7	0	1	6	1	0	1	11	2	0	5	4	1	0	251	1298
08:35:00 AM	3	6	5	0	1	4	1	0	3	7	2	0	2	1	3	0	177	1211
08:40:00 AM	2	10	3	0	4	3	0	0	3	11	1	0	7	8	3	0	142	1139
08:45:00 AM	0	16	2	0	4	8	1	0	5	9	1	0	4	2	4	0	149	1062
08:50:00 AM	0	3	5	0	7	5	1	0	3	7	2	0	8	7	5	0	164	1015
08:55:00 AM	0	6	10	0	4	14	0	0	1	9	3	0	4	5	9	0	174	992

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Wallace Rd NW*
E/W street	*Glen Creek Rd NW*
City, State	Salem OR
Site Notes	
Location	44.95009 - -123.05165
Start Date	Thursday, September 16, 2021
Start Time	06:00:00 AM
Weather	
Study ID #	
Peak Hour Start	07:20:00 AM
Peak 15 Min Start	07:40:00 AM
PHF (15-Min Int)	0.94



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
145	882	100	0	32	1326	17	0	55	75	429	0	159	50	28	0	1127	1375	559	237	1914	965	212	207

Percent Heavy Vehicles

7.6%	6.9%	7.0%	0.0%	3.1%	2.3%	0.0%	0.0%	0.0%	1.3%	0.7%	0.0%	4.4%	6.0%	3.6%	0.0%	7.0%	2.3%	0.7%	4.6%	2.1%	6.4%	6.6%	4.3%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				Southbound				Eastbound				Westbound					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
0	0	1	0	0	1	0	0	0	3	1	0	0	0	0	0	6	4	2	3	2	11

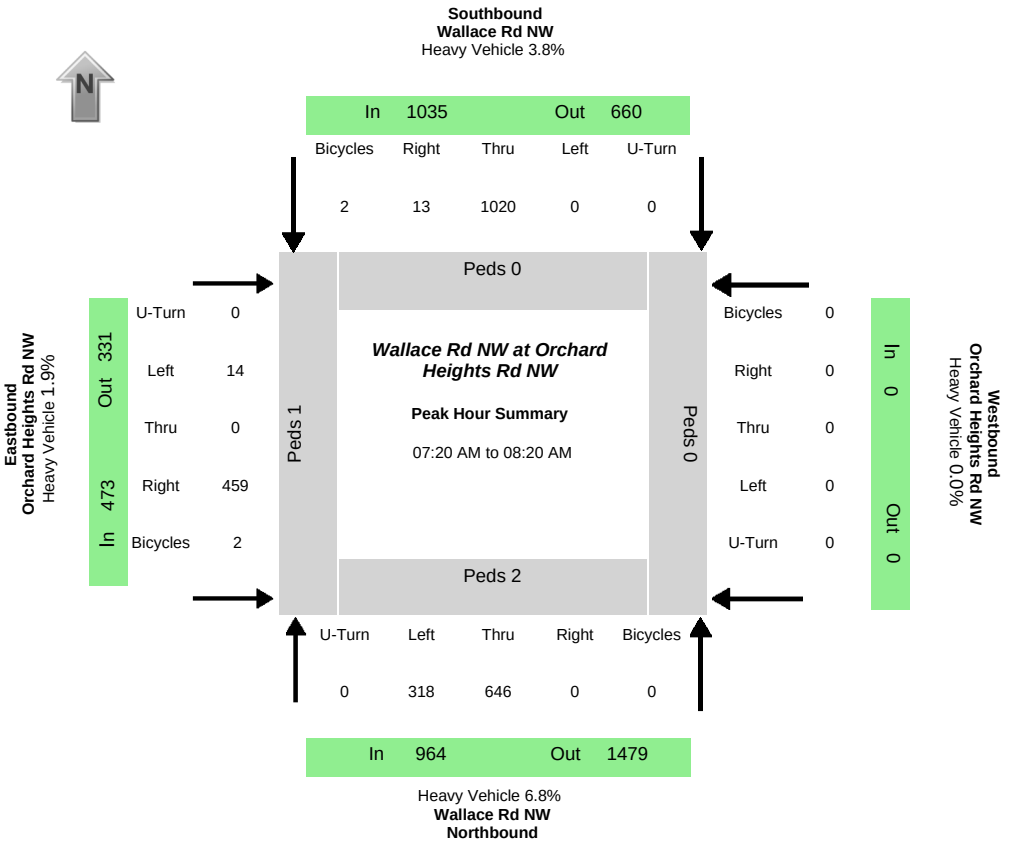
All Vehicle Volumes

	Northbound Wallace Rd NW				Southbound Wallace Rd NW				Eastbound Glen Creek Rd NW				Westbound Glen Creek Rd NW				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
06:00:00 AM	2	54	3	0	3	41	0	0	2	1	19	0	4	1	0	0		
06:05:00 AM	0	51	2	0	1	38	1	0	4	1	17	1	2	1	2	0		
06:10:00 AM	3	48	1	0	0	51	0	0	2	1	18	0	5	2	3	0	385	
06:15:00 AM	2	50	0	0	0	56	0	0	2	2	23	0	6	2	5	0	403	
06:20:00 AM	4	52	3	0	2	58	0	0	1	6	20	0	7	1	1	0	437	
06:25:00 AM	2	50	0	0	0	68	1	0	1	8	17	0	7	5	1	0	463	
06:30:00 AM	4	47	2	0	0	67	0	0	2	3	23	0	5	6	1	0	475	
06:35:00 AM	4	52	3	0	0	101	0	0	3	3	18	0	11	3	2	0	520	
06:40:00 AM	3	50	2	0	2	83	0	0	3	1	34	0	10	3	1	0	552	
06:45:00 AM	6	51	3	0	1	78	1	0	7	5	38	0	9	2	4	0	597	
06:50:00 AM	4	79	9	0	0	97	1	0	2	2	17	0	16	6	1	0	631	
06:55:00 AM	5	47	4	0	1	83	1	0	2	8	27	0	6	5	1	0	629	2029
07:00:00 AM	5	55	4	0	1	103	0	0	5	4	37	0	8	2	1	0	649	2124
07:05:00 AM	9	44	3	0	0	115	1	0	4	2	25	0	13	4	0	0	635	2223
07:10:00 AM	4	54	9	0	0	105	2	0	0	3	27	0	3	7	5	0	664	2308
07:15:00 AM	11	64	7	0	1	108	2	0	1	4	45	0	18	2	2	0	704	2425
07:20:00 AM	8	63	10	0	1	99	0	0	2	5	34	0	10	4	1	0	721	2507
07:25:00 AM	7	90	9	0	1	106	3	0	6	2	32	0	9	5	2	0	774	2619
07:30:00 AM	10	73	9	0	2	116	1	0	3	6	34	0	10	5	2	0	780	2730
07:35:00 AM	7	66	5	0	2	116	2	0	5	5	38	0	17	9	3	0	818	2805
07:40:00 AM	9	89	8	0	2	118	0	0	8	9	26	0	18	0	3	0	836	2903
07:45:00 AM	14	65	8	0	3	137	1	0	3	7	41	0	12	5	3	0	864	2997
07:50:00 AM	22	63	3	0	2	107	0	0	7	10	47	0	16	4	3	0	873	3047
07:55:00 AM	11	68	12	0	5	100	3	0	6	4	34	0	14	2	1	0	843	3117

08:00:00 AM	15	91	9	0	5	125	3	0	1	4	31	0	15	5	2	0	850	3198
08:05:00 AM	18	60	6	0	4	95	3	0	2	4	32	0	13	5	2	0	810	3222
08:10:00 AM	14	67	14	0	4	96	1	0	9	12	48	0	10	2	2	0	829	3282
08:15:00 AM	10	87	7	0	1	111	0	0	3	7	32	0	15	4	4	0	804	3298
08:20:00 AM	14	64	5	0	1	68	2	0	4	3	48	0	11	4	2	0	786	3287
08:25:00 AM	13	74	6	0	5	77	0	0	4	7	34	0	14	7	4	0	752	3260
08:30:00 AM	5	78	8	0	5	82	1	0	6	12	38	0	9	5	4	0	724	3242
08:35:00 AM	11	71	10	0	2	92	1	0	1	9	42	0	25	8	3	0	773	3242
08:40:00 AM	18	58	13	0	3	79	1	0	2	10	43	0	19	6	1	0	781	3205
08:45:00 AM	17	74	7	0	3	84	0	0	5	9	38	0	22	6	7	0	800	3178
08:50:00 AM	14	78	13	0	5	85	0	0	6	16	31	0	16	2	2	0	793	3162
08:55:00 AM	11	72	7	0	3	111	1	0	4	3	26	0	20	8	3	0	809	3171

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Wallace Rd NW*
E/W street	*Orchard Heights Rd NW*
City, State	Salem OR
Site Notes	
Location	44.95334 - -123.05251
Start Date	Thursday, September 16, 2021
Start Time	06:00:00 AM
Weather	
Study ID #	
Peak Hour Start	07:20:00 AM
Peak 15 Min Start	07:30:00 AM
PHF (15-Min Int)	0.88



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
318	646	0	0	0	1020	13	0	14	0	459	0	0	0	0	0	964	1033	473	0	1479	660	331	0

Percent Heavy Vehicles

2.5%	9.0%	0.0%	0.0%	0.0%	3.5%	23.1%	0.0%	7.1%	0.0%	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%	6.8%	3.8%	1.9%	0.0%	3.0%	8.9%	3.3%	0.0%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum
0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	4

PHV - Pedestrians

in Crosswalk				
NB	SB	EB	WB	Sum
2	0	1	0	3

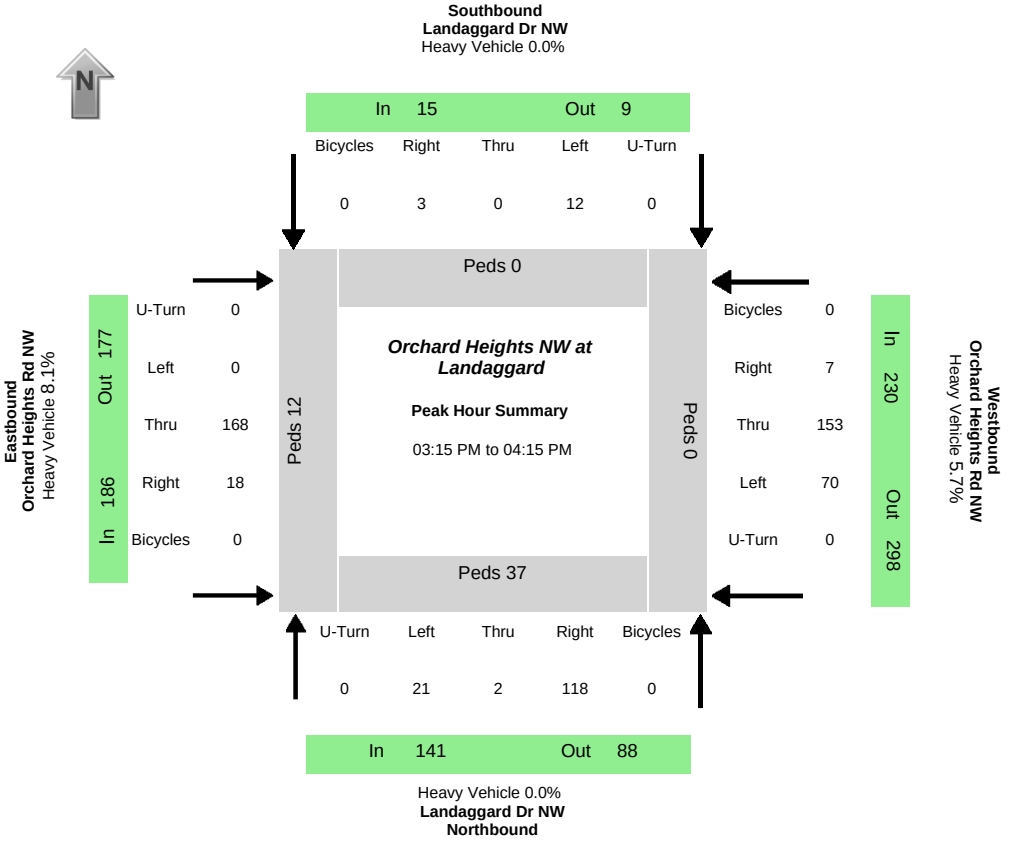
All Vehicle Volumes

	Northbound Wallace Rd NW				Southbound Wallace Rd NW				Eastbound Orchard Heights Rd NW				Westbound Orchard Heights Rd NW				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
06:00:00 AM	2	43	0	0	0	27	0	0	0	0	8	0	0	0	0	0		
06:05:00 AM	7	43	0	0	0	37	0	0	0	0	6	0	0	0	0	0		
06:10:00 AM	5	48	0	0	0	42	0	0	0	0	12	0	0	0	0	0	280	
06:15:00 AM	7	58	0	0	0	61	1	0	1	0	9	0	0	0	0	0	337	
06:20:00 AM	4	35	0	0	0	41	0	0	1	0	14	0	0	0	0	0	339	
06:25:00 AM	3	57	0	0	0	58	1	0	1	0	23	0	0	0	0	0	375	
06:30:00 AM	6	44	0	0	0	63	1	0	3	0	17	0	0	0	0	0	372	
06:35:00 AM	5	48	0	0	0	77	0	0	0	0	18	0	0	0	0	0	425	
06:40:00 AM	6	42	0	0	0	79	1	0	1	0	29	0	0	0	0	0	440	
06:45:00 AM	11	58	0	0	0	68	0	0	1	0	24	0	0	0	0	0	468	
06:50:00 AM	13	53	0	0	0	68	1	0	1	0	24	0	0	0	0	0	480	
06:55:00 AM	12	40	0	0	0	75	0	0	1	0	30	0	0	0	0	0	480	1575
07:00:00 AM	16	35	0	0	0	85	1	0	0	0	35	0	0	0	0	0	490	1667
07:05:00 AM	11	46	0	0	0	101	1	0	1	0	25	0	0	0	0	0	515	1759
07:10:00 AM	14	44	0	0	0	78	1	0	1	0	27	0	0	0	0	0	522	1817
07:15:00 AM	19	43	0	0	0	81	1	0	0	0	31	0	0	0	0	0	525	1855
07:20:00 AM	15	63	0	0	0	75	2	0	0	0	34	0	0	0	0	0	529	1949
07:25:00 AM	29	54	0	0	0	84	0	0	1	0	21	0	0	0	0	0	553	1995
07:30:00 AM	37	49	0	0	0	88	1	0	0	0	55	0	0	0	0	0	608	2091
07:35:00 AM	28	63	0	0	0	104	1	0	0	0	41	0	0	0	0	0	656	2180
07:40:00 AM	26	65	0	0	0	103	2	0	1	0	37	0	0	0	0	0	701	2256
07:45:00 AM	21	48	0	0	0	93	0	0	2	0	58	0	0	0	0	0	693	2316
07:50:00 AM	24	48	0	0	0	97	0	0	0	0	32	0	0	0	0	0	657	2357
07:55:00 AM	21	53	0	0	0	83	3	0	2	0	38	0	0	0	0	0	623	2399

08:00:00 AM	35	52	0	0	0	86	2	0	2	0	45	0	0	0	0	0	623	2449
08:05:00 AM	21	41	0	0	0	68	0	0	3	0	19	0	0	0	0	0	574	2416
08:10:00 AM	30	58	0	0	0	77	0	0	1	0	40	0	0	0	0	0	580	2457
08:15:00 AM	31	52	0	0	0	62	2	0	2	0	39	0	0	0	0	0	546	2470
08:20:00 AM	20	39	0	0	0	60	3	0	2	0	31	0	0	0	0	0	549	2436
08:25:00 AM	15	78	0	0	0	66	0	0	1	0	35	0	0	0	0	0	538	2442
08:30:00 AM	18	64	0	0	0	52	1	0	5	0	30	0	0	0	0	0	520	2382
08:35:00 AM	13	54	0	0	0	47	1	0	3	0	34	0	0	0	0	0	517	2297
08:40:00 AM	12	59	0	0	0	86	0	0	0	0	31	0	0	0	0	0	510	2251
08:45:00 AM	22	52	0	0	0	78	4	0	1	0	32	0	0	0	0	0	529	2218
08:50:00 AM	22	56	0	0	0	95	2	0	1	0	32	0	0	0	0	0	585	2225
08:55:00 AM	27	62	0	0	0	64	1	0	2	0	25	0	0	0	0	0	578	2206

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Landaggard Dr NW*
E/W street	*Orchard Heights Rd NW*
City, State	Salem OR
Site Notes	
Location	44.96044 - -123.083449
Start Date	Tuesday, September 13, 2022
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	03:15:00 PM
Peak 15 Min Start	03:20:00 PM
PHF (15-Min Int)	0.58



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
21	2	118	0	12	0	3	0	0	168	18	0	70	153	7	0	141	15	186	230	88	9	177	298

Percent Heavy Vehicles

0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.9%	0.0%	0.0%	2.9%	7.2%	0.0%	0.0%	0.0%	0.0%	8.1%	5.7%	2.3%	0.0%	6.2%	5.0%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PHV - Pedestrians

in Crosswalk				
NB	SB	EB	WB	**Sum**
37	0	12	0	49

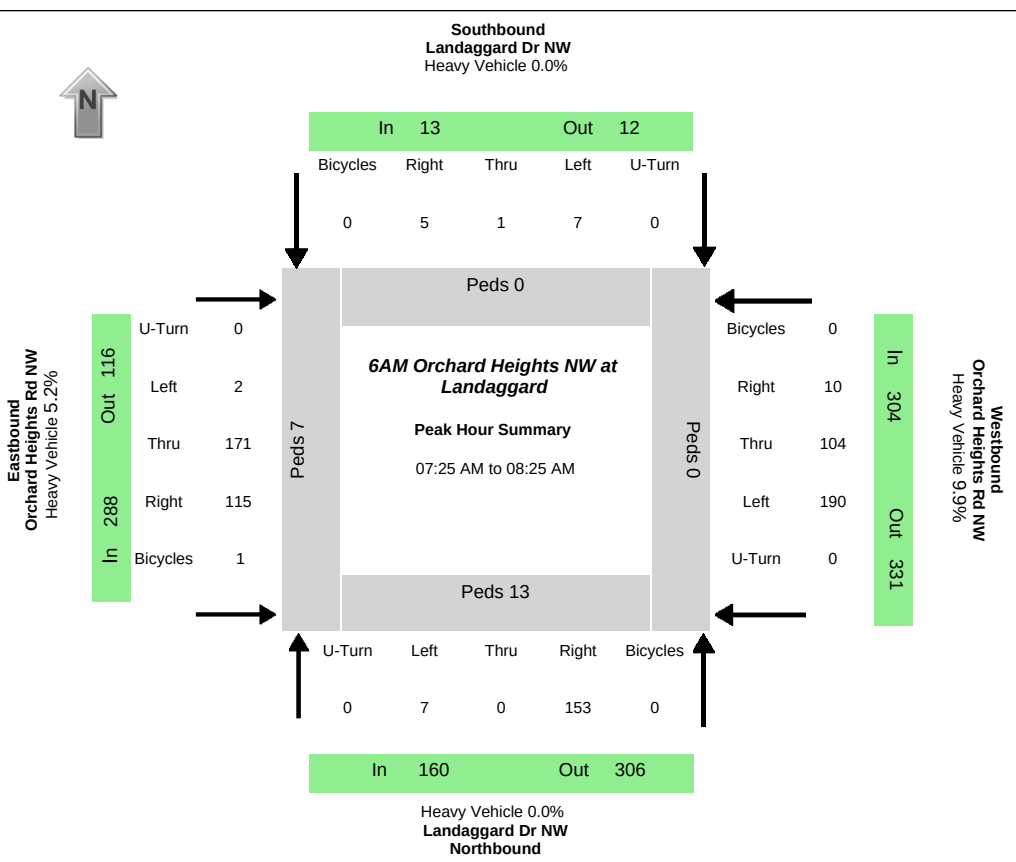
All Vehicle Volumes

	Northbound Landaggard Dr NW				Southbound Landaggard Dr NW				Eastbound Orchard Heights Rd NW				Westbound Orchard Heights Rd NW				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	1	0	4	0	1	0	0	0	0	4	1	0	4	9	0	1		
02:05:00 PM	1	0	0	0	1	0	0	0	0	4	0	0	1	6	0	0		
02:10:00 PM	0	0	0	0	3	0	0	0	0	9	0	0	0	5	0	0	55	
02:15:00 PM	0	0	0	0	0	0	0	0	0	11	1	0	0	7	0	0	49	
02:20:00 PM	0	1	0	0	0	0	0	0	0	8	1	0	1	7	1	0	55	
02:25:00 PM	0	0	1	0	0	0	0	0	0	4	0	0	0	10	0	0	53	
02:30:00 PM	0	0	0	0	0	0	1	0	1	15	0	0	1	14	0	0	66	
02:35:00 PM	0	0	1	0	0	0	0	0	0	13	1	0	2	11	1	0	76	
02:40:00 PM	0	0	0	0	1	0	0	0	0	7	1	0	2	12	0	0	84	
02:45:00 PM	0	0	0	0	2	0	0	0	0	5	0	0	3	6	1	0	69	
02:50:00 PM	0	0	0	0	0	0	0	0	0	3	2	0	2	9	0	0	56	
02:55:00 PM	0	0	0	0	0	0	1	0	0	10	1	0	4	13	0	0	62	254
03:00:00 PM	0	0	0	0	0	0	0	0	0	11	3	0	5	11	0	0	75	259
03:05:00 PM	1	0	1	0	0	0	1	0	0	12	0	0	5	13	0	0	92	279
03:10:00 PM	1	0	1	0	0	0	0	0	0	6	2	0	4	13	3	0	93	292
03:15:00 PM	0	0	5	0	2	0	0	0	0	13	1	0	9	18	2	0	113	323
03:20:00 PM	4	0	14	0	3	0	1	0	0	26	0	0	8	20	1	0	157	381
03:25:00 PM	2	2	22	0	2	0	0	0	0	21	2	0	9	15	1	0	203	442
03:30:00 PM	3	0	31	0	1	0	2	0	0	24	5	0	13	13	0	0	245	502
03:35:00 PM	6	0	25	0	1	0	0	0	0	11	1	0	4	7	0	0	223	528
03:40:00 PM	0	0	9	0	0	0	0	0	0	7	4	0	5	6	0	0	178	536
03:45:00 PM	2	0	4	0	1	0	0	0	0	9	0	0	9	8	0	0	119	552
03:50:00 PM	0	0	2	0	2	0	0	0	0	14	1	0	2	3	0	0	88	560
03:55:00 PM	0	0	1	0	0	0	0	0	0	14	1	0	2	12	0	0	87	561

04:00:00 PM	3	0	3	0	0	0	0	0	0	11	1	0	4	8	0	0	84	561
04:05:00 PM	0	0	2	0	0	0	0	0	0	9	1	0	1	19	1	0	93	561
04:10:00 PM	1	0	0	0	0	0	0	0	0	9	1	0	4	24	2	0	104	572
04:15:00 PM	2	0	1	0	0	0	1	0	0	10	3	0	3	14	1	1	110	558
04:20:00 PM	0	0	5	0	0	0	0	0	0	9	0	0	2	7	0	0	100	504
04:25:00 PM	1	0	0	0	1	0	0	0	0	7	2	0	1	8	1	0	80	449
04:30:00 PM	1	0	0	0	0	0	0	0	0	6	2	0	5	12	1	0	71	384
04:35:00 PM	0	0	0	0	0	0	0	0	0	2	1	0	3	12	0	0	66	347
04:40:00 PM	1	0	2	0	0	0	1	0	0	8	1	0	1	9	0	0	68	339
04:45:00 PM	0	0	1	0	0	0	0	0	1	9	0	0	4	9	1	0	66	331
04:50:00 PM	0	0	0	0	1	0	0	0	0	10	1	0	4	9	1	0	74	333
04:55:00 PM	1	0	4	0	1	0	0	0	0	6	2	0	2	8	1	0	76	328
05:00:00 PM	0	0	0	0	0	0	0	0	0	9	2	0	5	6	2	0	75	322
05:05:00 PM	0	1	1	0	0	1	0	0	0	10	1	0	6	14	3	0	86	326
05:10:00 PM	3	0	1	0	1	0	0	0	0	15	3	0	1	6	0	0	91	315
05:15:00 PM	0	0	1	0	1	0	0	0	0	8	2	0	1	11	0	0	91	303
05:20:00 PM	2	0	0	0	1	0	0	0	0	8	0	0	1	14	1	0	81	307
05:25:00 PM	1	0	1	0	0	0	0	0	0	5	1	0	1	15	1	0	76	311
05:30:00 PM	0	0	1	0	1	0	0	0	0	4	1	0	3	13	1	0	76	308
05:35:00 PM	1	0	1	0	0	0	0	0	0	6	0	0	0	15	2	0	74	315
05:40:00 PM	1	0	1	0	1	0	0	0	1	6	0	0	2	9	0	0	70	313
05:45:00 PM	0	0	0	0	0	0	0	0	0	5	1	0	1	7	0	0	60	302
05:50:00 PM	1	0	0	0	0	0	0	0	0	9	0	0	1	8	0	0	54	295
05:55:00 PM	0	0	0	0	0	0	0	0	0	10	1	0	0	8	0	0	52	289

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Landaggard Dr NW*
E/W street	*Orchard Heights Rd NW*
City, State	Salem OR
Site Notes	
Location	44.96044 - -123.083449
Start Date	Tuesday, September 13, 2022
Start Time	06:00:00 AM
Weather	
Study ID #	
Peak Hour Start	07:25:00 AM
Peak 15 Min Start	08:00:00 AM
PHF (15-Min Int)	0.66



Peak-Hour Volumes (PHV)																								
Northbound				Southbound				Eastbound				Westbound				Entering				Leaving				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB	
7	0	153	0	7	1	5	0	2	171	115	0	190	104	10	0	160	13	288	304	306	12	116	331	
Percent Heavy Vehicles																								
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.8%	0.0%	0.0%	10.5%	0.0%	100.0%	0.0%	0.0%	0.0%	5.2%	9.9%	6.5%	83.3%	0.0%	4.5%	

PHV- Bicycles																	PHV - Pedestrians					
Northbound				Southbound				Eastbound				Westbound					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	13	0	7	0	20

All Vehicle Volumes

	Northbound Landaggard Dr NW				Southbound Landaggard Dr NW				Eastbound Orchard Heights Rd NW				Westbound Orchard Heights Rd NW				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
06:00:00 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0		
06:05:00 AM	0	0	0	0	1	0	0	0	0	4	0	0	0	5	0	0		
06:10:00 AM	0	0	0	0	0	0	0	0	0	5	0	0	0	7	0	0	26	
06:15:00 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	24	
06:20:00 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	5	0	0	23	
06:25:00 AM	0	0	0	0	0	0	0	0	0	6	0	0	0	8	0	0	25	
06:30:00 AM	1	0	0	0	1	0	0	0	0	7	0	0	0	5	1	0	38	
06:35:00 AM	0	0	0	0	0	0	0	0	0	5	0	0	0	2	0	0	36	
06:40:00 AM	0	0	1	0	0	0	0	0	0	10	0	0	0	6	0	0	39	
06:45:00 AM	0	0	0	0	1	0	0	0	0	7	0	0	0	6	0	0	38	
06:50:00 AM	0	0	1	0	1	0	0	0	0	3	0	0	1	6	0	0	43	
06:55:00 AM	0	0	0	0	1	0	0	0	0	8	0	0	0	6	1	0	42	132
07:00:00 AM	0	0	0	0	0	0	0	0	0	16	1	0	0	3	1	0	49	149
07:05:00 AM	0	0	0	0	0	0	0	0	0	14	0	0	0	4	1	0	56	158
07:10:00 AM	1	0	0	0	2	0	0	0	0	11	1	0	2	3	1	0	61	167
07:15:00 AM	0	0	1	0	0	0	0	0	0	12	1	0	1	2	0	0	57	182
07:20:00 AM	1	0	2	0	2	0	0	0	0	18	0	0	3	4	1	0	69	204
07:25:00 AM	0	0	1	0	2	0	0	0	0	25	0	0	1	5	0	0	82	224
07:30:00 AM	1	0	1	0	3	0	1	0	0	28	2	0	3	7	2	0	113	257
07:35:00 AM	0	0	1	0	0	0	1	0	0	10	1	0	7	6	2	0	110	278
07:40:00 AM	0	0	5	0	0	0	0	0	0	12	1	0	6	16	2	0	118	303
07:45:00 AM	0	0	6	0	0	0	0	0	0	11	4	0	20	8	0	0	119	338
07:50:00 AM	0	0	13	0	0	0	0	0	0	8	5	0	19	2	1	0	139	374
07:55:00 AM	1	0	13	0	0	1	0	0	0	9	19	0	25	7	0	0	172	433

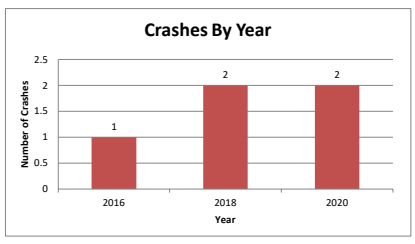
08:00:00 AM	1	0	25	0	0	0	0	0	0	9	24	0	25	14	0	0	221	510
08:05:00 AM	0	0	25	0	0	0	1	0	0	16	21	0	19	9	1	0	265	583
08:10:00 AM	1	0	25	0	0	0	2	0	2	11	20	0	25	12	0	0	288	660
08:15:00 AM	2	0	27	0	2	0	0	0	0	15	10	0	21	12	2	0	281	734
08:20:00 AM	1	0	11	0	0	0	0	0	0	17	8	0	19	6	0	0	251	765
08:25:00 AM	0	0	3	0	0	0	0	0	0	14	3	0	5	3	0	0	181	759
08:30:00 AM	0	0	3	0	1	0	0	0	0	21	0	0	1	7	0	0	123	744
08:35:00 AM	0	0	0	0	0	0	0	0	0	10	0	0	4	1	0	0	76	731
08:40:00 AM	0	0	1	0	1	0	0	0	0	17	0	0	1	13	0	0	81	722
08:45:00 AM	0	0	2	0	2	0	0	0	0	13	1	0	1	11	0	0	78	703
08:50:00 AM	0	0	0	0	2	0	0	0	0	11	1	0	1	13	0	0	91	683
08:55:00 AM	0	0	0	0	0	0	0	0	0	9	0	0	2	8	2	0	79	629

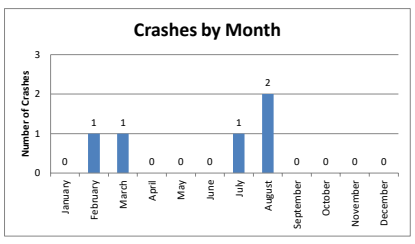
Project Name:	Bonaventure Titan Hill Multifamily
Project Number	1774
Query Information:	Doaks Ferry_Glen Creek
Date Queried:	January 2016 - December 2020
Data Provider:	ODOT Crash Analysis Reporting Unit
Analyst:	JWW
Summary Date:	9/8/2022
Text File Name:	
Filters Applied:	: : County: Polk

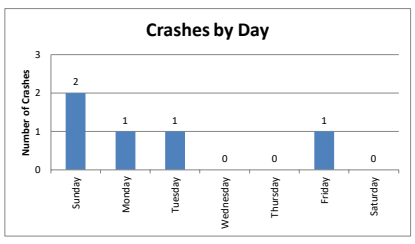
Doaks Ferry Road/ Glen Creek Road

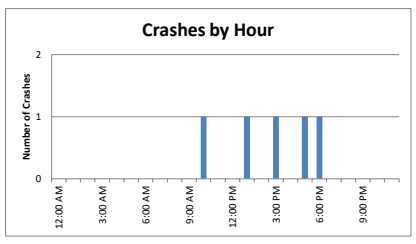
(January 2016 through December 2020)

Crash Summary by Date and Time

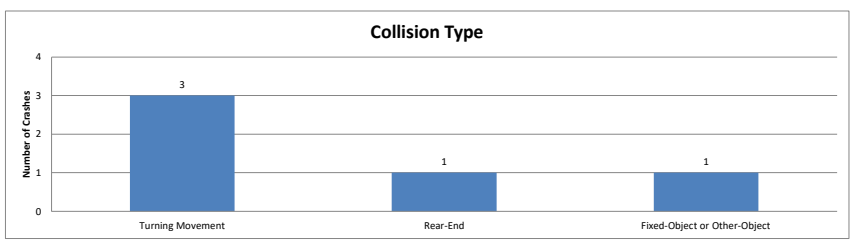


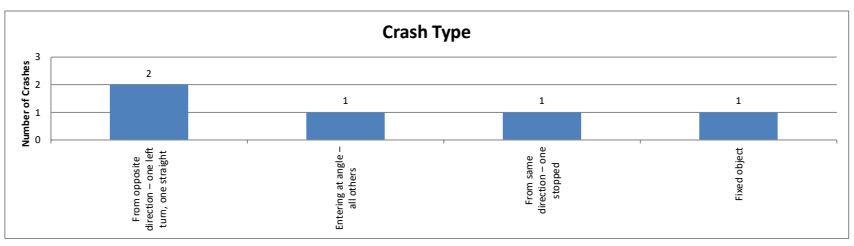




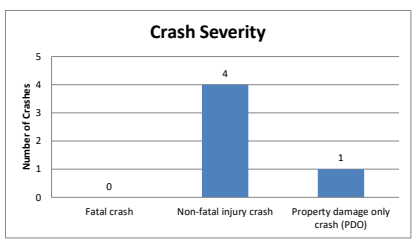


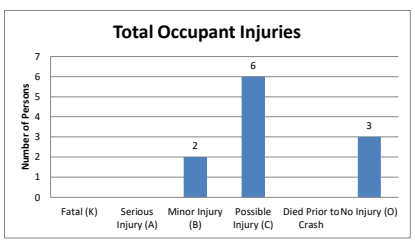
Crash Summary by Type



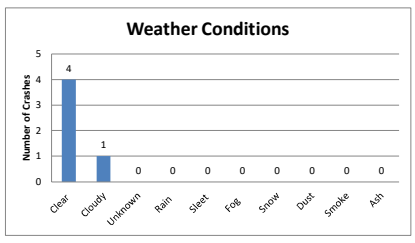


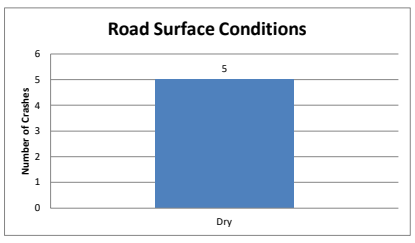
Crash Severity

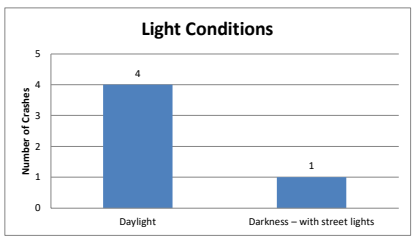




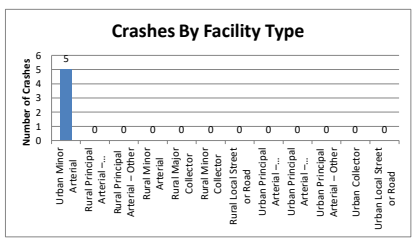
Crash Environment Characteristics

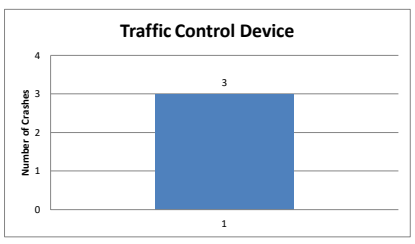


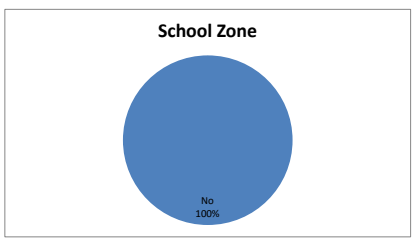


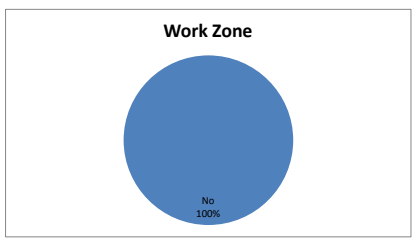


Crash Area Characteristics

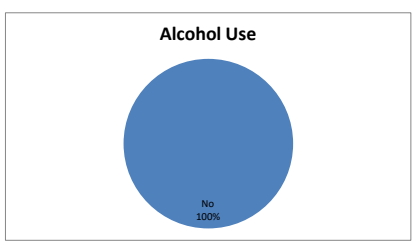


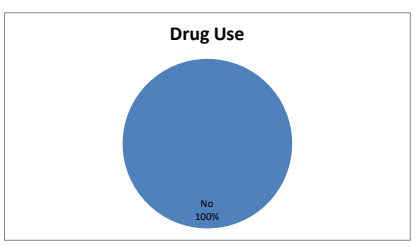




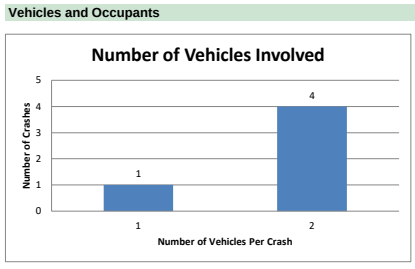


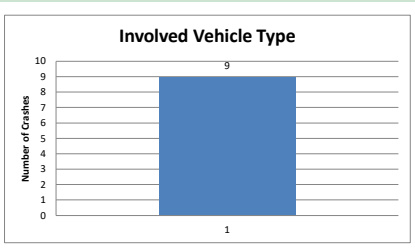
Driving Impairments

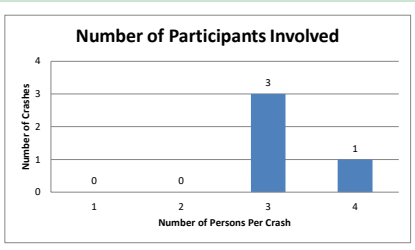




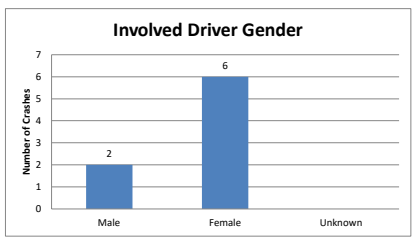
Vehicles and Occupants

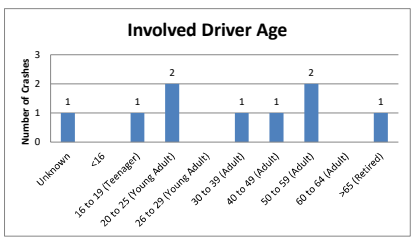


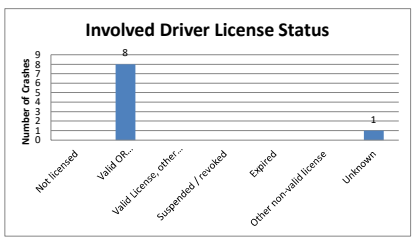


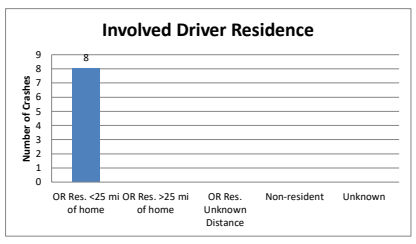


Involved Driver Characteristics

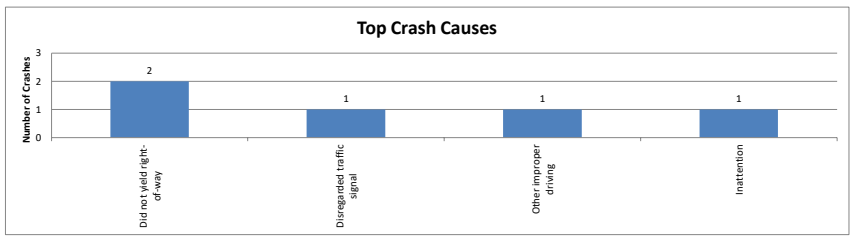


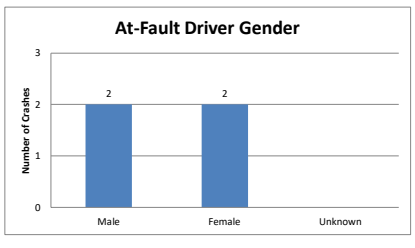


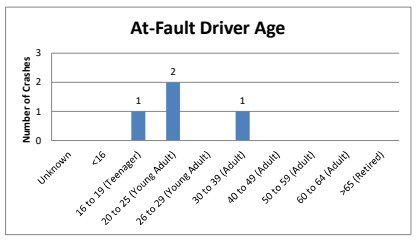




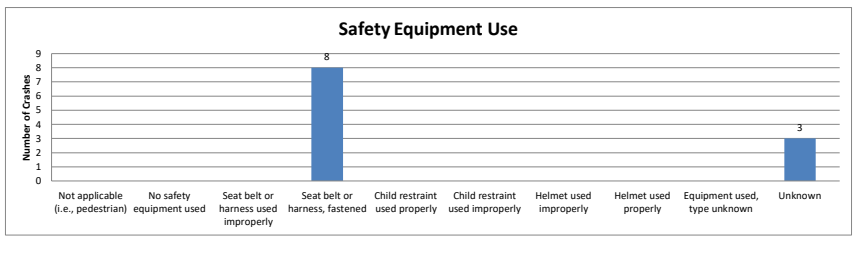
At-Fault Driver Characteristics

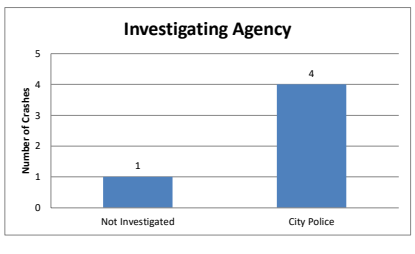






Other Crash Characteristics



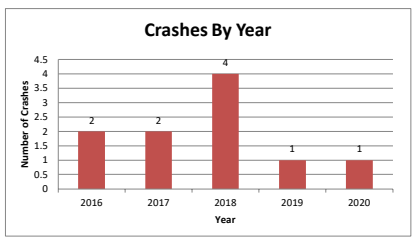


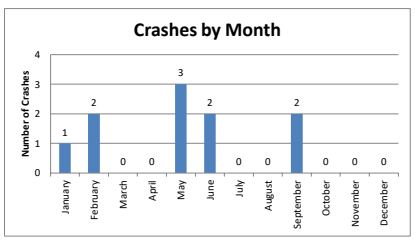
Project Name:	Bonaventure Titan Hill Multifamily
Project Number	1774
Query Information:	Doaks Ferry_Orchard Heights
Date Queried:	January 2016 - December 2020
Data Provider:	ODOT Crash Analysis Reporting Unit
Analyst:	JWW
Summary Date:	9/8/2022
Text File Name:	
Filters Applied:	: : County: Polk

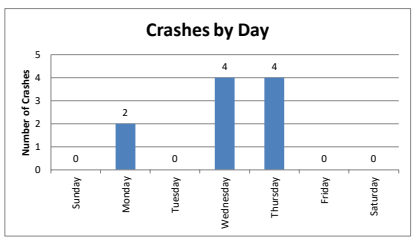
Doaks Ferry Road/ Orchard Heights Road

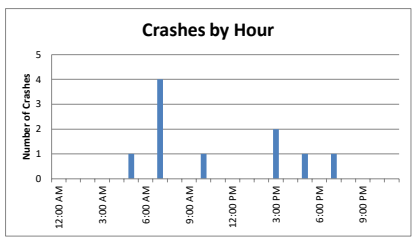
(January 2016 through December 2020)

Crash Summary by Date and Time

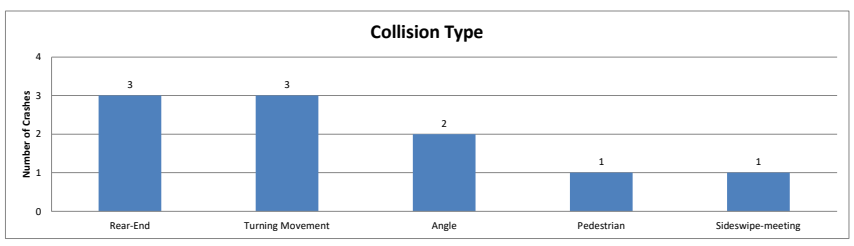


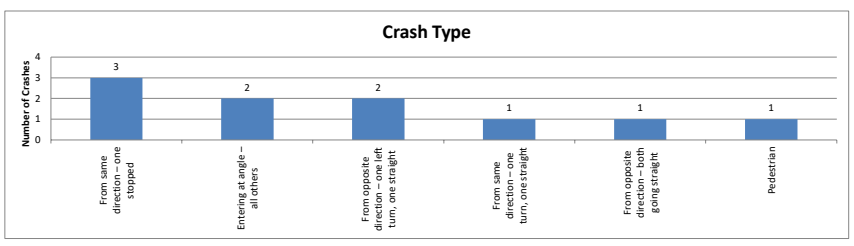




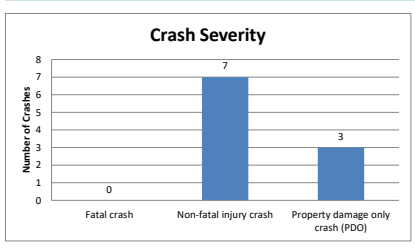


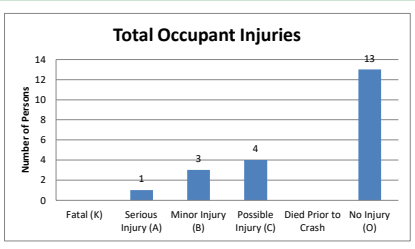
Crash Summary by Type



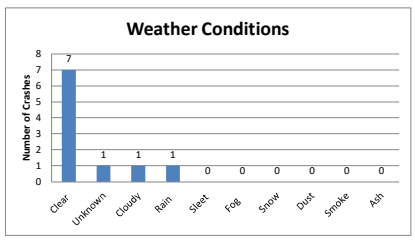


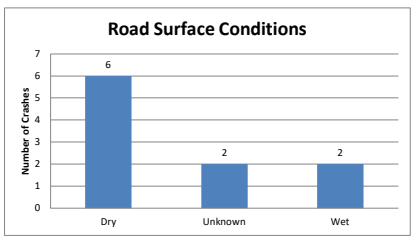
Crash Severity

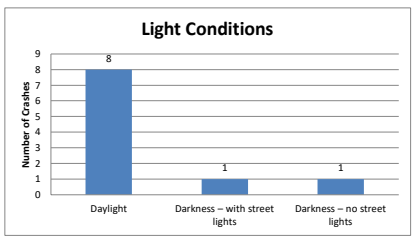




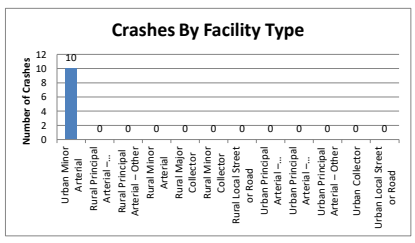
Crash Environment Characteristics

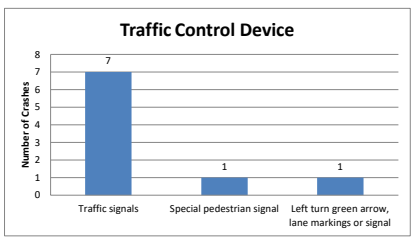


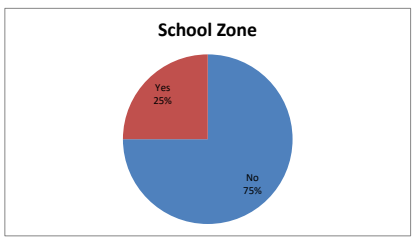


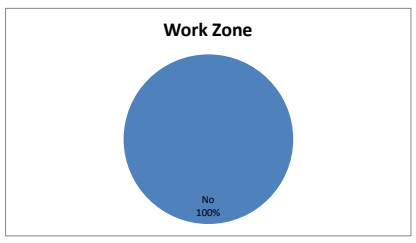


Crash Area Characteristics

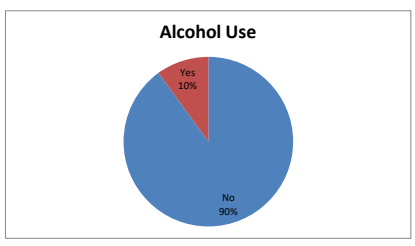


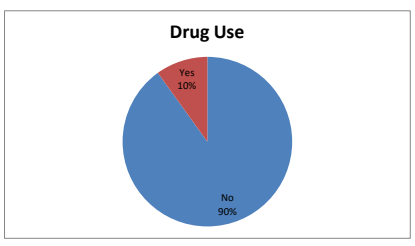




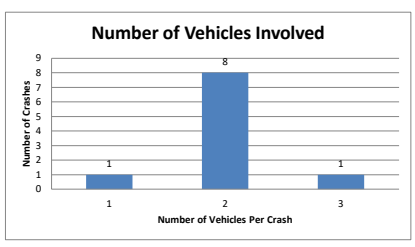


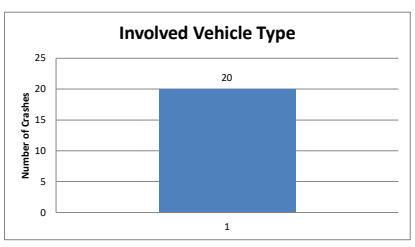
Driving Impairments

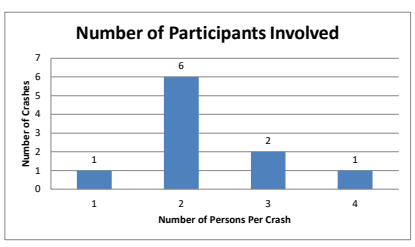




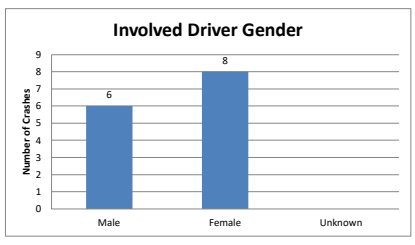
Vehicles and Occupants

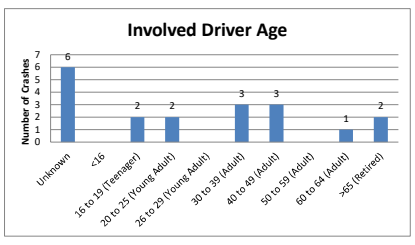


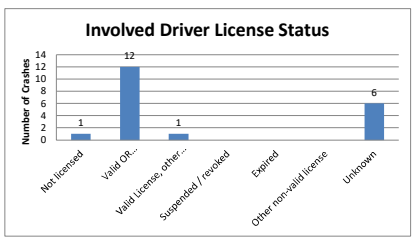


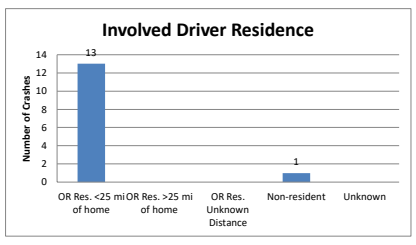


Involved Driver Characteristics

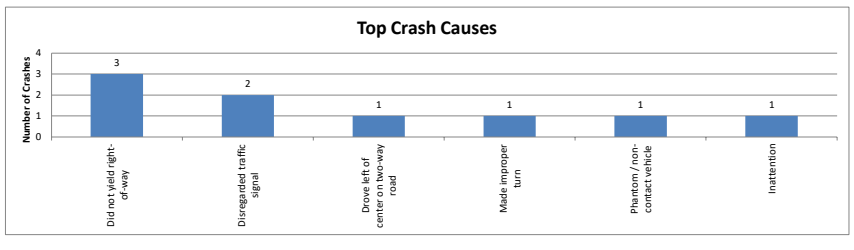


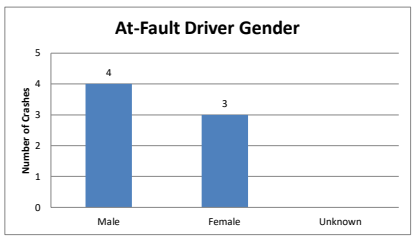


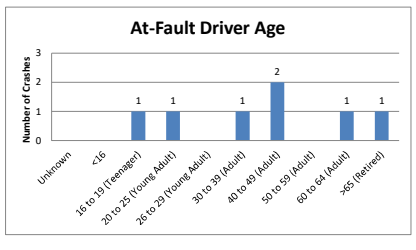




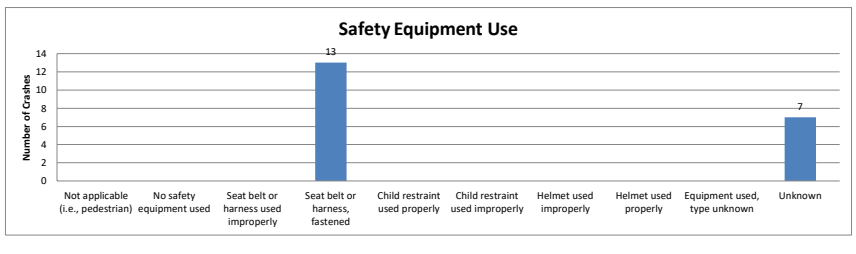
At-Fault Driver Characteristics

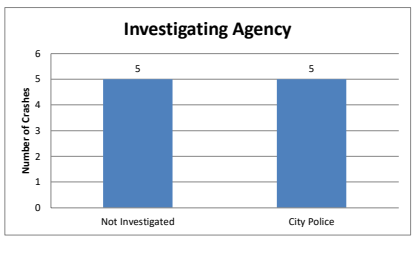






Other Crash Characteristics



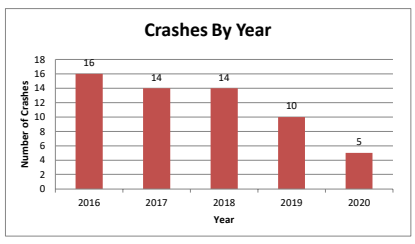


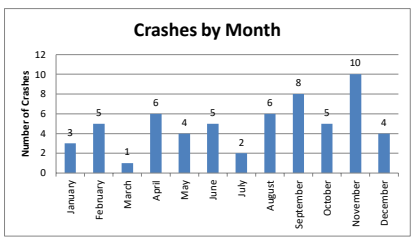
Project Name:	Bonaventure Titan Hill Multifamily
Project Number	1774
Query Information:	Wallace_Glen Creek
Date Queried:	January 2016 - December 2020
Data Provider:	ODOT Crash Analysis Reporting Unit
Analyst:	JWW
Summary Date:	9/8/2022
Text File Name:	
Filters Applied:	: : County: Polk

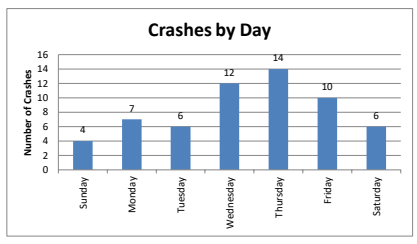
Wallace Road/ Glen Creek Road

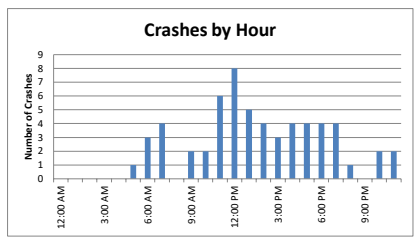
(January 2016 through December 2020)

Crash Summary by Date and Time

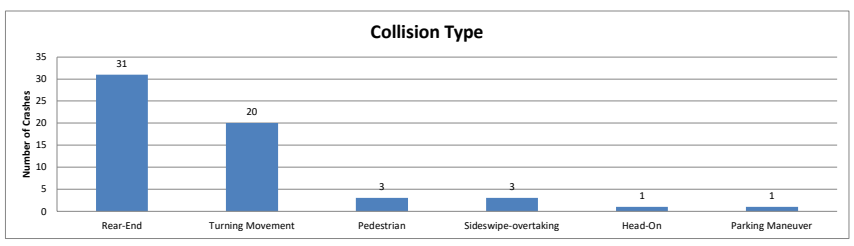


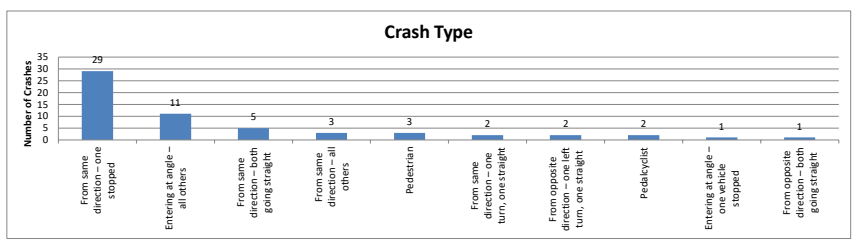




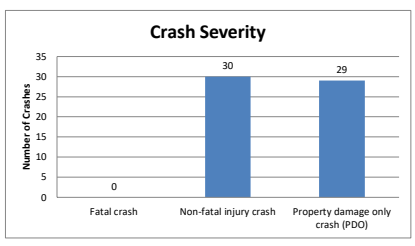


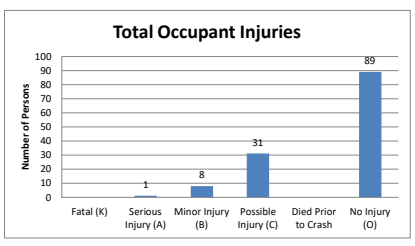
Crash Summary by Type



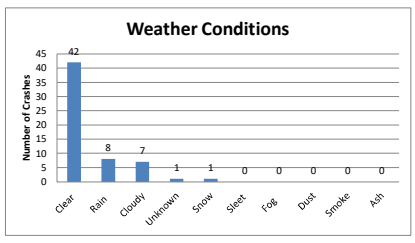


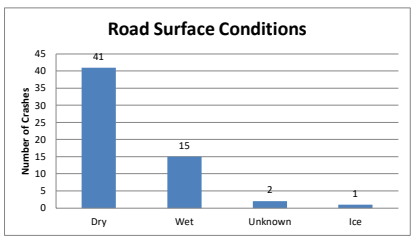
Crash Severity

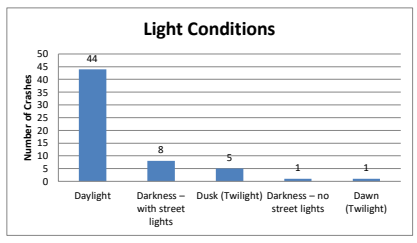




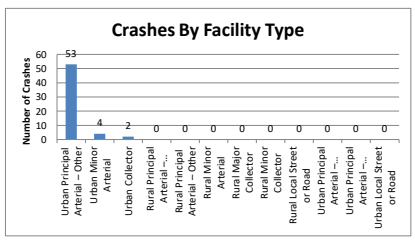
Crash Environment Characteristics

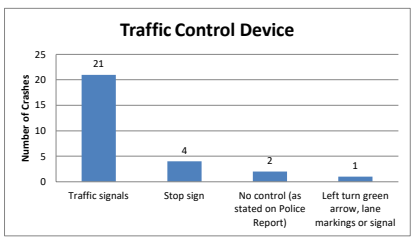


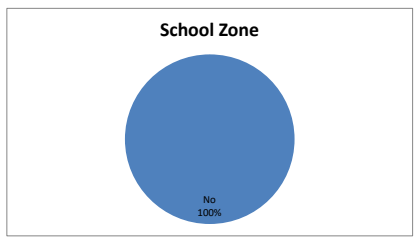


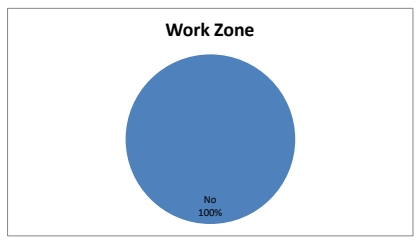


Crash Area Characteristics

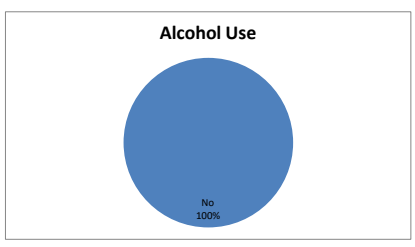


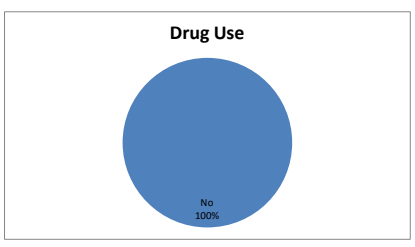




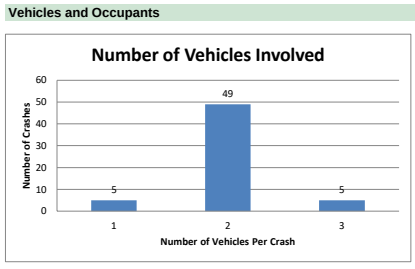


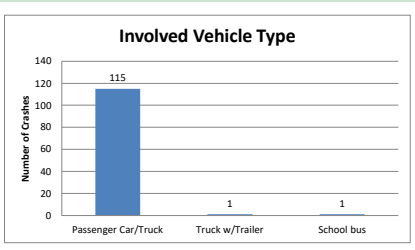
Driving Impairments

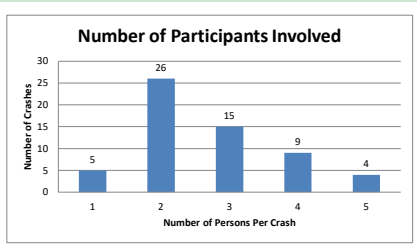




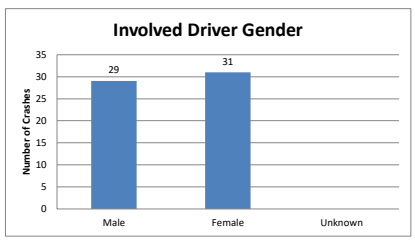
Vehicles and Occupants

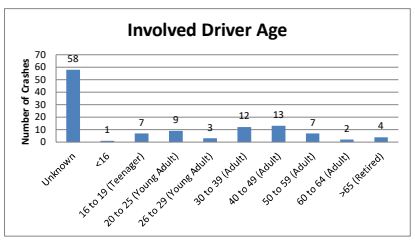


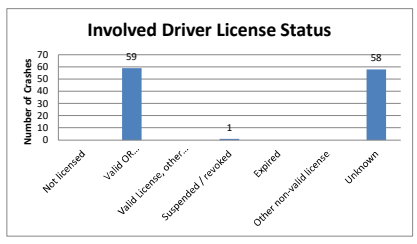


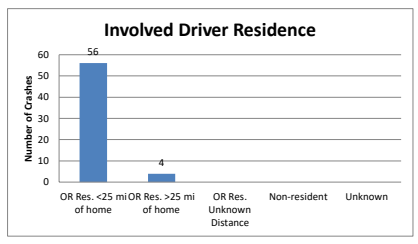


Involved Driver Characteristics

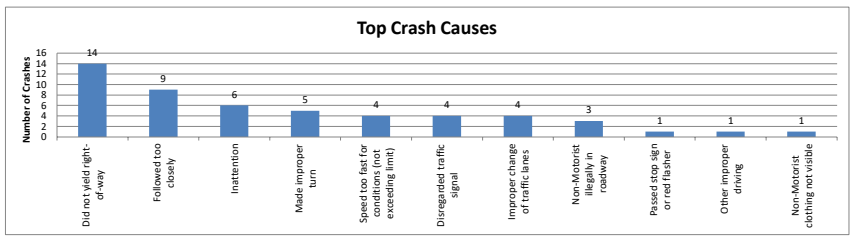


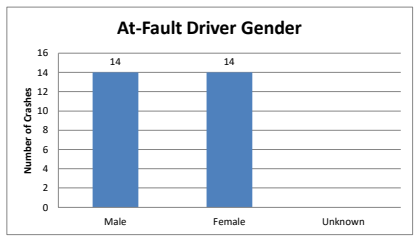


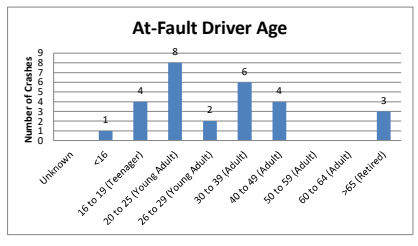




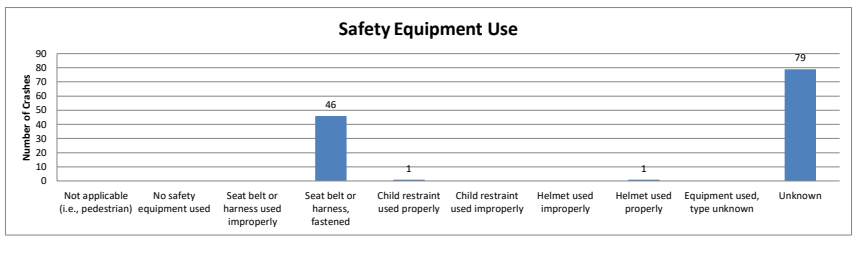
At-Fault Driver Characteristics

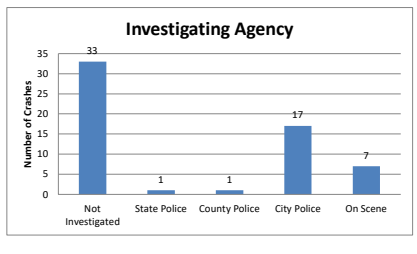






Other Crash Characteristics



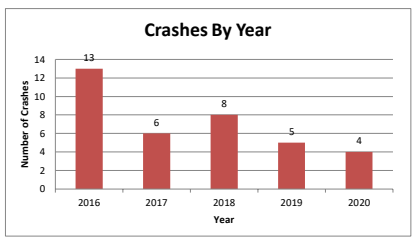


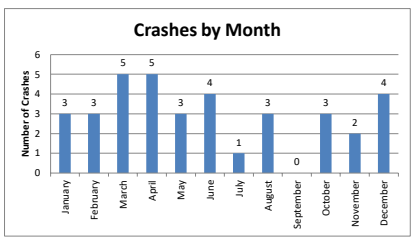
Project Name:	Bonaventure Titan Hill Multifamily
Project Number	1774
Query Information:	Wallace_Orchard Heights
Date Queried:	January 2016 - December 2020
Data Provider:	ODOT Crash Analysis Reporting Unit
Analyst:	JWW
Summary Date:	9/8/2022
Text File Name:	
Filters Applied:	: : County: Polk

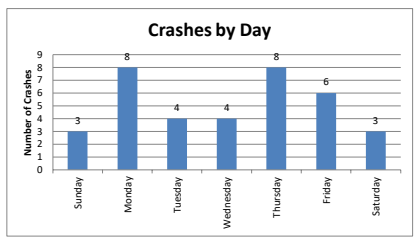
Wallace Road/ Orchard Heights Road

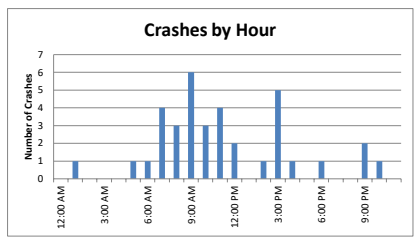
(January 2016 through December 2020)

Crash Summary by Date and Time

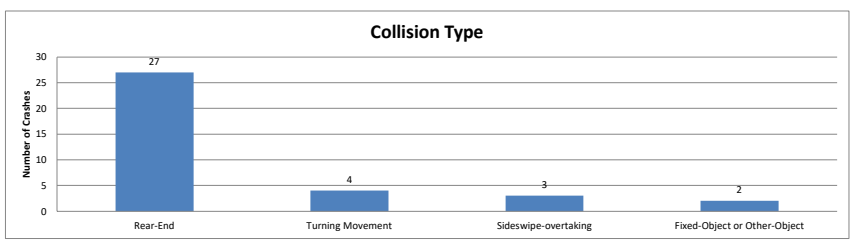


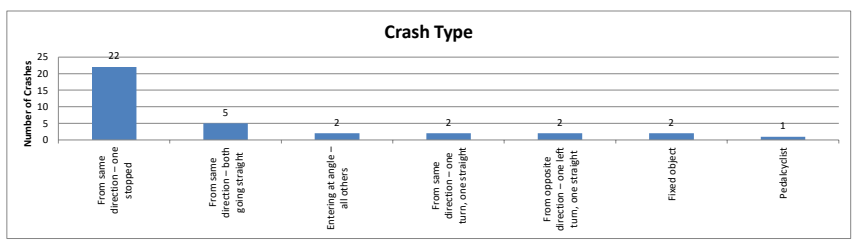




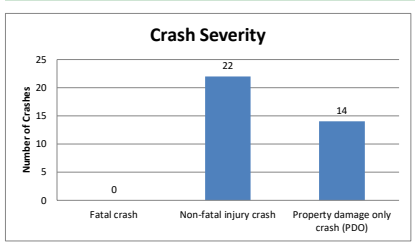


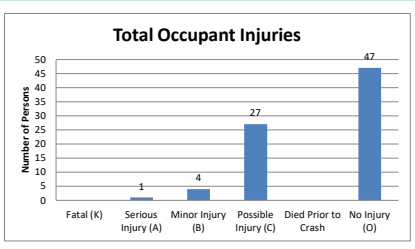
Crash Summary by Type



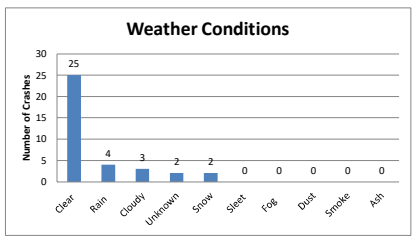


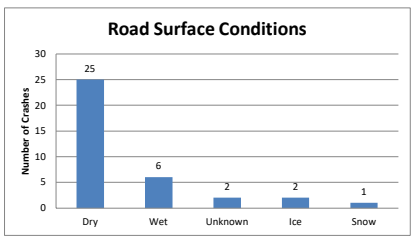
Crash Severity

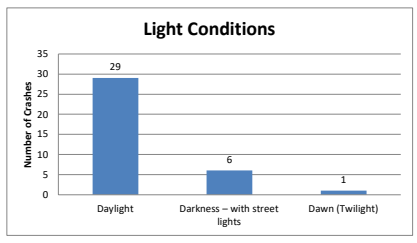




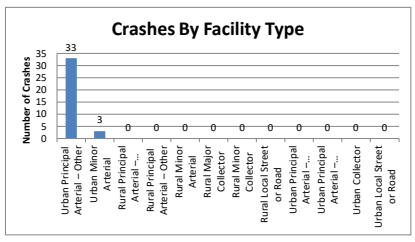
Crash Environment Characteristics

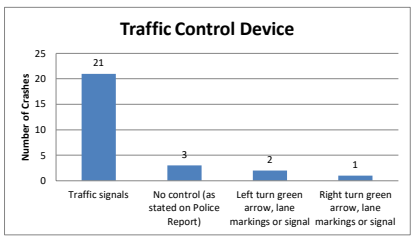


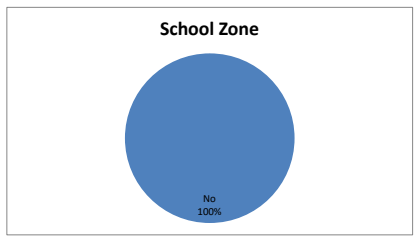


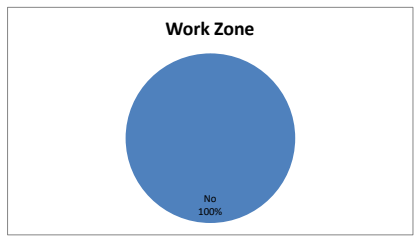


Crash Area Characteristics

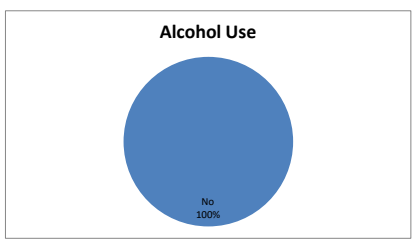


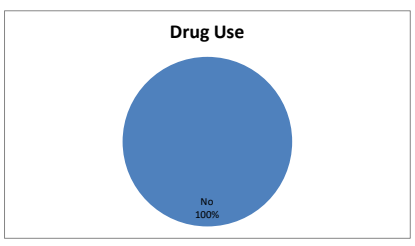




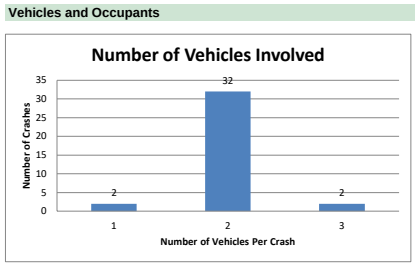


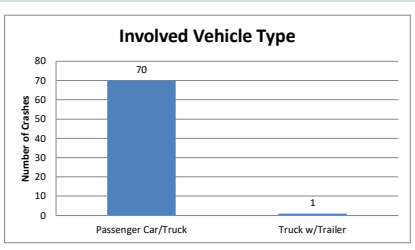
Driving Impairments

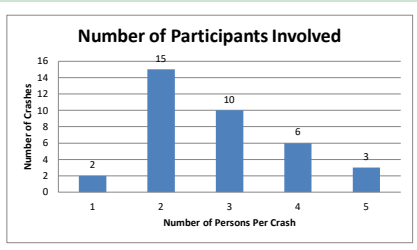




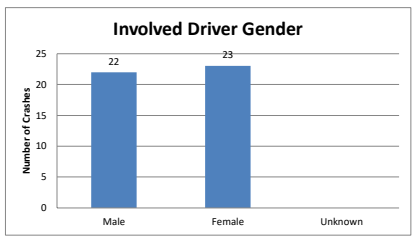
Vehicles and Occupants

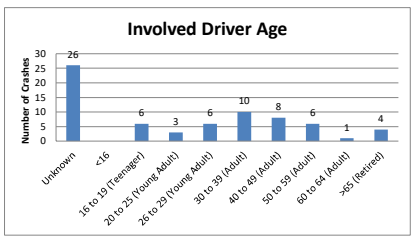


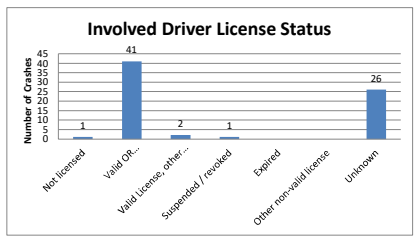


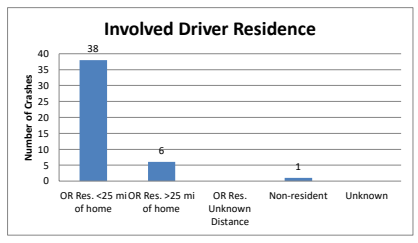


Involved Driver Characteristics

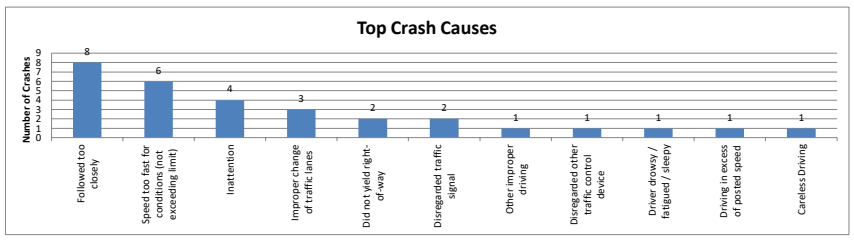


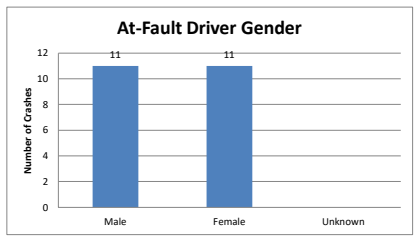


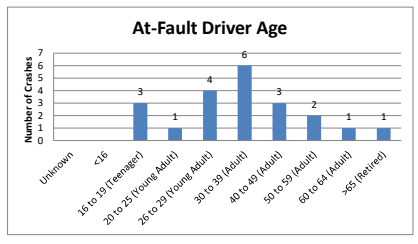




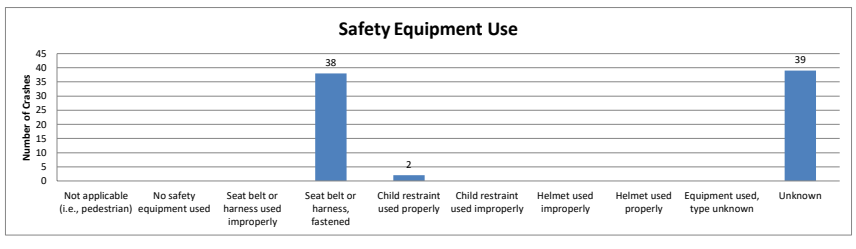
At-Fault Driver Characteristics

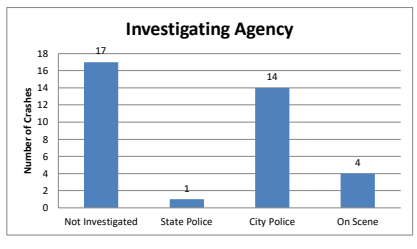






Other Crash Characteristics





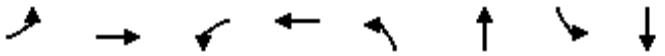
Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	171	115	190	104	10	7	0	153	7	1	5
Future Vol, veh/h	2	171	115	190	104	10	7	0	153	7	1	5
Conflicting Peds, #/hr	0	0	13	13	0	0	7	0	0	0	0	7
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	110	-	-	225	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	66	66	66	66	66	66	66	66	66	66	66	66
Heavy Vehicles, %	0	9	0	11	0	100	0	0	0	0	0	0
Mvmt Flow	3	259	174	288	158	15	11	0	232	11	2	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	173	0	0	446	0	0	1119	1114	359	1210	1194	173
Stage 1	-	-	-	-	-	-	365	365	-	742	742	-
Stage 2	-	-	-	-	-	-	754	749	-	468	452	-
Critical Hdwy	4.1	-	-	4.21	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.299	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1416	-	-	1068	-	-	186	210	690	161	188	876
Stage 1	-	-	-	-	-	-	658	627	-	411	425	-
Stage 2	-	-	-	-	-	-	404	422	-	579	574	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1416	-	-	1055	-	-	141	151	681	84	135	870
Mov Cap-2 Maneuver	-	-	-	-	-	-	141	151	-	84	135	-
Stage 1	-	-	-	-	-	-	649	618	-	410	309	-
Stage 2	-	-	-	-	-	-	288	307	-	381	566	-

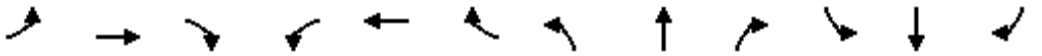
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	6.1	13.9	36.2
HCM LOS			B	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	141	681	1416	-	-	1055	-	-	135
HCM Lane V/C Ratio	0.075	0.34	0.002	-	-	0.273	-	-	0.146
HCM Control Delay (s)	32.6	13	7.5	-	-	9.7	-	-	36.2
HCM Lane LOS	D	B	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	0.2	1.5	0	-	-	1.1	-	-	0.5



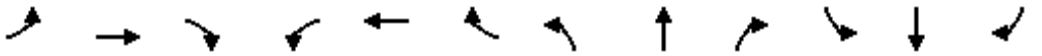
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	267	309	263	26	316	48	246
v/c Ratio	0.19	0.74	0.54	0.35	0.09	0.79	0.21	0.58
Control Delay	12.6	38.3	13.8	16.1	17.4	33.7	18.8	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	38.3	13.8	16.1	17.4	33.7	18.8	28.0
Queue Length 50th (ft)	12	93	65	69	6	84	12	67
Queue Length 95th (ft)	38	214	157	162	26	206	40	189
Internal Link Dist (ft)		872		1419		1586		230
Turn Bay Length (ft)	190		200		200		110	
Base Capacity (vph)	410	910	747	1235	318	850	260	889
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.29	0.41	0.21	0.08	0.37	0.18	0.28

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	199	33	269	188	41	23	101	174	42	179	35
Future Volume (vph)	56	199	33	269	188	41	23	101	174	42	179	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	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	0.99		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.91		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1536	1632		1653	1674		1561	1557		1525	1685	
Flt Permitted	0.60	1.00		0.37	1.00		0.54	1.00		0.31	1.00	
Satd. Flow (perm)	965	1632		652	1674		880	1557		495	1685	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	64	229	38	309	216	47	26	116	200	48	206	40
RTOR Reduction (vph)	0	6	0	0	8	0	0	67	0	0	8	0
Lane Group Flow (vph)	64	261	0	309	255	0	26	249	0	48	238	0
Confl. Peds. (#/hr)	5		16	16		5	10		5	5		10
Confl. Bikes (#/hr)						1						1
Heavy Vehicles (%)	11%	6%	15%	3%	5%	0%	9%	6%	1%	12%	1%	17%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	18.7	16.2		34.1	27.6		15.5	14.1		17.9	15.3	
Effective Green, g (s)	18.7	16.2		34.1	27.6		15.5	14.1		17.9	15.3	
Actuated g/C Ratio	0.29	0.25		0.53	0.43		0.24	0.22		0.28	0.24	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	0.5	0.5		0.5	0.5		0.5	0.5		0.5	0.5	
Lane Grp Cap (vph)	300	408		557	713		225	338		178	397	
v/s Ratio Prot	0.01	c0.16		c0.12	0.15		0.00	c0.16		c0.01	0.14	
v/s Ratio Perm	0.05			0.17			0.03			0.06		
v/c Ratio	0.21	0.64		0.55	0.36		0.12	0.74		0.27	0.60	
Uniform Delay, d1	17.1	21.7		9.6	12.6		19.1	23.6		17.9	22.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	2.4		0.7	0.1		0.1	7.1		0.3	1.8	
Delay (s)	17.2	24.1		10.2	12.7		19.2	30.7		18.2	23.8	
Level of Service	B	C		B	B		B	C		B	C	
Approach Delay (s)		22.8			11.4			29.8			22.9	
Approach LOS		C			B			C			C	

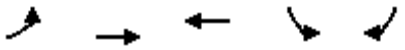
Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	64.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	199	33	269	188	41	23	101	174	42	179	35
Future Volume (veh/h)	56	199	33	269	188	41	23	101	174	42	179	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.97	0.99		0.96	0.99		0.98	0.99		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	1646	1716	1589	1758	1730	1800	1674	1716	1786	1632	1786	1561
Adj Flow Rate, veh/h	64	229	38	309	216	47	26	116	200	48	206	40
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	11	6	15	3	5	0	9	6	1	12	1	17
Cap, veh/h	414	332	55	488	483	105	305	145	250	233	393	76
Arrive On Green	0.04	0.23	0.23	0.16	0.35	0.35	0.02	0.26	0.26	0.03	0.27	0.27
Sat Flow, veh/h	1567	1426	237	1674	1364	297	1594	558	962	1554	1442	280
Grp Volume(v), veh/h	64	0	267	309	0	263	26	0	316	48	0	246
Grp Sat Flow(s),veh/h/ln	1567	0	1663	1674	0	1661	1594	0	1520	1554	0	1722
Q Serve(g_s), s	1.8	0.0	8.4	7.4	0.0	7.0	0.7	0.0	11.2	1.3	0.0	7.0
Cycle Q Clear(g_c), s	1.8	0.0	8.4	7.4	0.0	7.0	0.7	0.0	11.2	1.3	0.0	7.0
Prop In Lane	1.00		0.14	1.00		0.18	1.00		0.63	1.00		0.16
Lane Grp Cap(c), veh/h	414	0	387	488	0	588	305	0	394	233	0	469
V/C Ratio(X)	0.15	0.00	0.69	0.63	0.00	0.45	0.09	0.00	0.80	0.21	0.00	0.52
Avail Cap(c_a), veh/h	518	0	841	798	0	1239	433	0	721	342	0	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.7	0.0	20.1	12.7	0.0	14.2	15.6	0.0	19.9	16.1	0.0	17.7
Incr Delay (d2), s/veh	0.1	0.0	0.8	0.5	0.0	0.2	0.0	0.0	1.5	0.2	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	3.1	2.4	0.0	2.3	0.2	0.0	3.7	0.4	0.0	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.8	0.0	20.9	13.2	0.0	14.4	15.6	0.0	21.3	16.2	0.0	18.1
LnGrp LOS	B	A	C	B	A	B	B	A	C	B	A	B
Approach Vol, veh/h		331			572			342			294	
Approach Delay, s/veh		20.0			13.8			20.9			17.8	
Approach LOS		B			B			C			B	

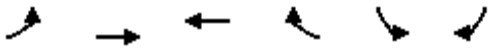
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.0	20.6	6.4	25.3	5.8	19.9	13.4	18.3
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	5.6	27.4	6.2	42.8	5.8	27.2	20.0	29.0
Max Q Clear Time (g_c+I1), s	2.7	9.0	3.8	9.0	3.3	13.2	9.4	10.4
Green Ext Time (p_c), s	0.0	0.3	0.0	0.4	0.0	0.5	0.1	0.4

Intersection Summary	
HCM 6th Ctrl Delay	17.4
HCM 6th LOS	B



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	296	236	366	301	254
v/c Ratio	0.58	0.25	0.75	0.69	0.44
Control Delay	11.3	7.3	23.3	26.5	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.3	7.3	23.3	26.5	5.6
Queue Length 50th (ft)	35	29	62	70	0
Queue Length 95th (ft)	100	82	188	191	48
Internal Link Dist (ft)		571	431	1342	
Turn Bay Length (ft)	75				150
Base Capacity (vph)	692	1584	969	1490	1364
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.43	0.15	0.38	0.20	0.19

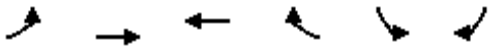
Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	272	217	114	223	277	234
Future Volume (vph)	272	217	114	223	277	234
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	5.0	5.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.91		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1692	1782	1540		1693	1515
Flt Permitted	0.31	1.00	1.00		0.95	1.00
Satd. Flow (perm)	546	1782	1540		1693	1515
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	296	236	124	242	301	254
RTOR Reduction (vph)	0	0	68	0	0	187
Lane Group Flow (vph)	296	236	298	0	301	67
Confl. Peds. (#/hr)	4			4		
Heavy Vehicles (%)	1%	1%	8%	3%	1%	1%
Turn Type	pm+pt	NA	NA		pm+pt	Perm
Protected Phases	3	8	4		2	
Permitted Phases	8				6	2 6
Actuated Green, G (s)	26.2	26.2	13.7		12.6	12.6
Effective Green, g (s)	26.2	26.2	13.7		12.6	12.6
Actuated g/C Ratio	0.55	0.55	0.29		0.26	0.26
Clearance Time (s)	4.0	5.0	5.0		4.0	
Vehicle Extension (s)	0.5	0.5	0.5		0.5	
Lane Grp Cap (vph)	503	976	441		446	399
v/s Ratio Prot	c0.10	0.13	0.19		c0.18	
v/s Ratio Perm	c0.22					0.04
v/c Ratio	0.59	0.24	0.67		0.67	0.17
Uniform Delay, d1	6.8	5.6	15.1		15.8	13.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.1	0.0	3.2		3.2	0.1
Delay (s)	7.9	5.7	18.3		18.9	13.6
Level of Service	A	A	B		B	B
Approach Delay (s)		6.9	18.3		16.5	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	47.8	Sum of lost time (s)	13.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



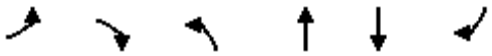
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	272	217	114	223	277	234
Future Volume (veh/h)	272	217	114	223	277	234
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.99	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1786	1786	1688	1758	1786	1786
Adj Flow Rate, veh/h	296	236	124	242	301	254
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	8	3	1	1
Cap, veh/h	511	986	153	298	375	334
Arrive On Green	0.15	0.55	0.30	0.30	0.22	0.22
Sat Flow, veh/h	1701	1786	509	993	1701	1514
Grp Volume(v), veh/h	296	236	0	366	301	254
Grp Sat Flow(s),veh/h/ln	1701	1786	0	1501	1701	1514
Q Serve(g_s), s	4.2	2.7	0.0	8.9	6.6	6.2
Cycle Q Clear(g_c), s	4.2	2.7	0.0	8.9	6.6	6.2
Prop In Lane	1.00			0.66	1.00	1.00
Lane Grp Cap(c), veh/h	511	986	0	451	375	334
V/C Ratio(X)	0.58	0.24	0.00	0.81	0.80	0.76
Avail Cap(c_a), veh/h	898	2073	0	1023	1932	1719
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.0	4.6	0.0	12.8	14.6	14.5
Incr Delay (d2), s/veh	0.4	0.0	0.0	1.4	1.5	1.4
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	0.6	0.0	2.5	2.2	1.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.4	4.6	0.0	14.2	16.1	15.8
LnGrp LOS	A	A	A	B	B	B
Approach Vol, veh/h		532	366		555	
Approach Delay, s/veh		6.7	14.2		16.0	
Approach LOS		A	B		B	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	12.7	10.0	16.9	26.9
Change Period (Y+Rc), s	4.0	4.0	5.0	5.0
Max Green Setting (Gmax), s	45.0	15.0	27.0	46.0
Max Q Clear Time (g_c+I1), s	8.6	6.2	10.9	4.7
Green Ext Time (p_c), s	0.1	0.1	0.6	0.3

Intersection Summary	
HCM 6th Ctrl Delay	12.1
HCM 6th LOS	B

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	16	440	265	904	1220
v/c Ratio	0.24	0.90	0.43	0.30	0.63
Control Delay	68.1	59.8	17.4	2.4	20.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	68.1	59.8	17.4	2.4	20.7
Queue Length 50th (ft)	13	340	101	0	322
Queue Length 95th (ft)	38	410	249	170	518
Internal Link Dist (ft)	1063			1080	560
Turn Bay Length (ft)	125		115		
Base Capacity (vph)	317	490	622	2996	1933
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.05	0.90	0.43	0.30	0.63

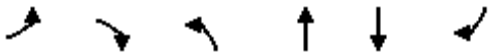
Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	15	405	244	832	1112	10
Future Volume (vph)	15	405	244	832	1112	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	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)	1471	1458	1614	3167	3244	
Flt Permitted	0.95	1.00	0.15	1.00	1.00	
Satd. Flow (perm)	1471	1458	247	3167	3244	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	440	265	904	1209	11
RTOR Reduction (vph)	0	19	0	0	0	0
Lane Group Flow (vph)	16	421	265	904	1220	0
Confl. Peds. (#/hr)	2					
Heavy Vehicles (%)	13%	2%	3%	5%	2%	40%
Turn Type	Prot	pm+ov	pm+pt	NA	NA	
Protected Phases	8	1	1	6	2	
Permitted Phases		8	6			
Actuated Green, G (s)	2.8	40.3	116.7	116.7	74.7	
Effective Green, g (s)	2.8	40.3	116.7	116.7	74.7	
Actuated g/C Ratio	0.02	0.31	0.90	0.90	0.57	
Clearance Time (s)	4.5	4.5	4.5	6.0	6.0	
Vehicle Extension (s)	1.5	1.0	1.0	0.5	0.5	
Lane Grp Cap (vph)	31	502	616	2842	1864	
v/s Ratio Prot	0.01	c0.24	0.12	0.29	c0.38	
v/s Ratio Perm		0.05	0.26			
v/c Ratio	0.52	0.84	0.43	0.32	0.65	
Uniform Delay, d1	62.9	41.8	11.4	1.0	18.8	
Progression Factor	1.00	1.00	2.59	2.65	1.00	
Incremental Delay, d2	5.9	11.2	0.1	0.2	1.8	
Delay (s)	68.8	53.0	29.8	2.8	20.7	
Level of Service	E	D	C	A	C	
Approach Delay (s)	53.5			8.9	20.7	
Approach LOS	D			A	C	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

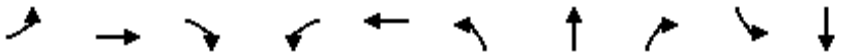
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	405	244	832	1112	10
Future Volume (veh/h)	15	405	244	832	1112	10
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	1573	1723	1709	1682	1723	1204
Adj Flow Rate, veh/h	16	440	265	904	1209	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	13	2	3	5	2	40
Cap, veh/h	324	440	338	2247	1938	18
Arrive On Green	0.22	0.22	0.17	1.00	0.58	0.58
Sat Flow, veh/h	1498	1460	1628	3279	3410	30
Grp Volume(v), veh/h	16	440	265	904	595	625
Grp Sat Flow(s),veh/h/ln	1498	1460	1628	1598	1637	1717
Q Serve(g_s), s	1.1	28.1	9.0	0.0	31.0	31.0
Cycle Q Clear(g_c), s	1.1	28.1	9.0	0.0	31.0	31.0
Prop In Lane	1.00	1.00	1.00			0.02
Lane Grp Cap(c), veh/h	324	440	338	2247	954	1001
V/C Ratio(X)	0.05	1.00	0.78	0.40	0.62	0.62
Avail Cap(c_a), veh/h	324	440	559	2247	954	1001
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.78	0.78	1.00	1.00
Uniform Delay (d), s/veh	40.4	45.4	16.1	0.0	17.8	17.8
Incr Delay (d2), s/veh	0.0	42.7	1.2	0.4	3.1	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	19.3	3.7	0.1	12.2	12.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	40.4	88.1	17.3	0.4	20.8	20.7
LnGrp LOS	D	F	B	A	C	C
Approach Vol, veh/h	456			1169	1220	
Approach Delay, s/veh	86.5			4.2	20.8	
Approach LOS	F			A	C	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	15.6	81.8				97.4	32.6
Change Period (Y+Rc), s	4.5	6.0				6.0	4.5
Max Green Setting (Gmax), s	28.7	58.2				91.4	28.1
Max Q Clear Time (g_c+I1), s	11.0	33.0				2.0	30.1
Green Ext Time (p_c), s	0.1	1.9				1.9	0.0

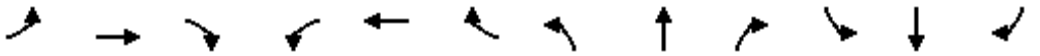
Intersection Summary	
HCM 6th Ctrl Delay	24.5
HCM 6th LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	60	111	595	156	68	145	1082	83	16	1496
v/c Ratio	0.62	0.32	0.80	0.70	0.19	0.70	0.59	0.09	0.32	0.91
Control Delay	86.4	46.0	41.4	74.6	33.7	77.7	21.1	0.8	80.9	35.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.4	46.0	41.4	74.6	33.7	77.7	21.1	0.8	80.9	35.2
Queue Length 50th (ft)	50	80	204	67	38	61	272	0	14	650
Queue Length 95th (ft)	96	132	275	102	77	#128	460	7	m20	#822
Internal Link Dist (ft)		939			288		444			1080
Turn Bay Length (ft)	150		300	75		300		200	170	
Base Capacity (vph)	141	373	774	417	406	206	1841	910	60	1650
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.30	0.77	0.37	0.17	0.70	0.59	0.09	0.27	0.91

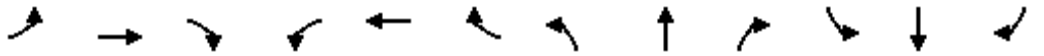
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	103	553	145	47	16	135	1006	77	15	1380	11
Future Volume (vph)	56	103	553	145	47	16	135	1006	77	15	1380	11
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	5.0	4.5		4.5	5.5	5.5	4.5	6.0	
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.99		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1662	1750	2543	3014	1547		3162	3167	1473	1554	3249	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1662	1750	2543	3014	1547		3162	3167	1473	1554	3249	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	60	111	595	156	51	17	145	1082	83	16	1484	12
RTOR Reduction (vph)	0	0	77	0	9	0	0	0	37	0	0	0
Lane Group Flow (vph)	60	111	518	156	59	0	145	1082	46	16	1496	0
Confl. Peds. (#/hr)	7		2	2		7	7					7
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	0%	0%	1%	7%	7%	12%	2%	5%	1%	7%	2%	27%
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	6.8	26.7	35.2	9.7	30.1		8.5	72.0	72.0	2.1	65.1	
Effective Green, g (s)	6.8	26.7	35.2	9.7	30.1		8.5	72.0	72.0	2.1	65.1	
Actuated g/C Ratio	0.05	0.21	0.27	0.07	0.23		0.07	0.55	0.55	0.02	0.50	
Clearance Time (s)	4.5	4.5	4.5	5.0	4.5		4.5	5.5	5.5	4.5	6.0	
Vehicle Extension (s)	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lane Grp Cap (vph)	86	359	776	224	358		206	1754	815	25	1626	
v/s Ratio Prot	0.04	0.06	c0.04	c0.05	c0.04		c0.05	0.34		0.01	c0.46	
v/s Ratio Perm			0.16						0.03			
v/c Ratio	0.70	0.31	0.67	0.70	0.16		0.70	0.62	0.06	0.64	0.92	
Uniform Delay, d1	60.6	43.8	42.2	58.7	39.9		59.5	19.7	13.4	63.6	30.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.13	0.93	
Incremental Delay, d2	18.0	0.2	1.7	7.4	0.1		8.6	1.6	0.1	25.7	7.4	
Delay (s)	78.6	44.0	43.9	66.1	40.0		68.1	21.3	13.5	97.4	35.2	
Level of Service	E	D	D	E	D		E	C	B	F	D	
Approach Delay (s)		46.6			58.2			26.0			35.8	
Approach LOS		D			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	35.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	80.4%	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)	56	103	553	145	47	16	135	1006	77	15	1380	11
Future Volume (veh/h)	56	103	553	145	47	16	135	1006	77	15	1380	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1736	1654	1654	1586	1723	1682	1736	1654	1723	1381
Adj Flow Rate, veh/h	60	111	595	156	51	17	145	1082	0	16	1484	12
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	1	7	7	12	2	5	1	7	2	27
Cap, veh/h	75	350	642	201	266	89	164	1819		18	1760	14
Arrive On Green	0.05	0.20	0.20	0.07	0.22	0.22	0.05	0.57	0.00	0.01	0.70	0.70
Sat Flow, veh/h	1667	1750	2544	3057	1184	395	3183	3195	1471	1576	3327	27
Grp Volume(v), veh/h	60	111	595	156	0	68	145	1082	0	16	730	766
Grp Sat Flow(s),veh/h/ln	1667	1750	1272	1528	0	1579	1591	1598	1471	1576	1637	1717
Q Serve(g_s), s	4.6	7.0	26.0	6.5	0.0	4.5	5.9	28.7	0.0	1.3	42.2	42.3
Cycle Q Clear(g_c), s	4.6	7.0	26.0	6.5	0.0	4.5	5.9	28.7	0.0	1.3	42.2	42.3
Prop In Lane	1.00		1.00	1.00		0.25	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	75	350	642	201	0	354	164	1819		18	866	908
V/C Ratio(X)	0.80	0.32	0.93	0.78	0.00	0.19	0.88	0.59		0.91	0.84	0.84
Avail Cap(c_a), veh/h	142	350	642	423	0	406	164	1819		62	866	908
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	0.65	0.65	0.65
Uniform Delay (d), s/veh	61.5	44.4	47.5	59.8	0.0	40.9	61.3	18.2	0.0	64.0	15.3	15.4
Incr Delay (d2), s/veh	6.9	0.2	19.3	2.4	0.0	0.1	38.0	1.4	0.0	30.0	6.6	6.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	3.1	11.1	2.6	0.0	1.8	3.2	10.7	0.0	0.7	13.9	14.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.4	44.6	66.8	62.2	0.0	41.0	99.3	19.7	0.0	94.0	22.0	21.7
LnGrp LOS	E	D	E	E	A	D	F	B		F	C	C
Approach Vol, veh/h		766			224			1227	A		1512	
Approach Delay, s/veh		63.7			55.8			29.1			22.6	
Approach LOS		E			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	74.8	10.4	33.7	6.0	80.0	13.5	30.5
Change Period (Y+Rc), s	4.5	6.0	4.5	4.5	4.5	* 6	5.0	4.5
Max Green Setting (Gmax), s	6.7	59.3	11.1	33.4	5.1	* 61	18.0	26.0
Max Q Clear Time (g_c+I1), s	7.9	44.3	6.6	6.5	3.3	30.7	8.5	28.0
Green Ext Time (p_c), s	0.0	2.4	0.0	0.1	0.0	2.3	0.0	0.0

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

Notes

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

User approved changes to right turn type.

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

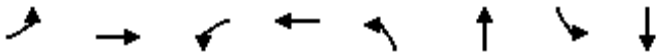
Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	168	18	70	153	7	21	2	118	12	0	3
Future Vol, veh/h	0	168	18	70	153	7	21	2	118	12	0	3
Conflicting Peds, #/hr	0	0	37	37	0	0	12	0	0	0	0	12
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	110	-	-	225	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	58	58	58	58	58	58	58	58	58	58	58	58
Heavy Vehicles, %	0	9	0	3	7	0	0	0	0	0	0	0
Mvmt Flow	0	290	31	121	264	12	36	3	203	21	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	276	0	0	358	0	0	870	861	343	921	870	282
Stage 1	-	-	-	-	-	-	343	343	-	512	512	-
Stage 2	-	-	-	-	-	-	527	518	-	409	358	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1299	-	-	1195	-	-	274	295	704	253	292	762
Stage 1	-	-	-	-	-	-	676	641	-	548	540	-
Stage 2	-	-	-	-	-	-	538	536	-	623	631	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1299	-	-	1153	-	-	239	255	679	161	252	753
Mov Cap-2 Maneuver	-	-	-	-	-	-	239	255	-	161	252	-
Stage 1	-	-	-	-	-	-	652	619	-	548	483	-
Stage 2	-	-	-	-	-	-	473	480	-	434	609	-

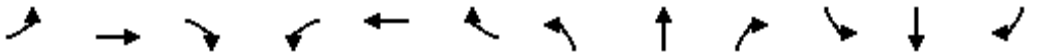
Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.6	14.3	26.8
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	240	679	1299	-	-	1153	-	-	191
HCM Lane V/C Ratio	0.165	0.3	-	-	-	0.105	-	-	0.135
HCM Control Delay (s)	22.9	12.6	0	-	-	8.5	-	-	26.8
HCM Lane LOS	C	B	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0.6	1.3	0	-	-	0.3	-	-	0.5



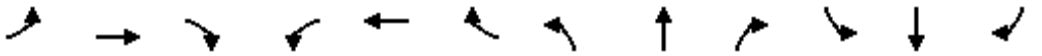
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	47	272	195	221	24	329	76	208
v/c Ratio	0.13	0.75	0.42	0.34	0.07	0.78	0.28	0.40
Control Delay	12.1	36.4	13.9	16.7	14.4	30.9	16.3	20.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	36.4	13.9	16.7	14.4	30.9	16.3	20.7
Queue Length 50th (ft)	9	84	39	54	5	75	16	47
Queue Length 95th (ft)	30	204	98	132	22	198	52	145
Internal Link Dist (ft)		896		1419		1586		230
Turn Bay Length (ft)	190		200		200		110	
Base Capacity (vph)	465	739	601	1006	456	1056	327	1137
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.37	0.32	0.22	0.05	0.31	0.23	0.18

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	179	61	172	136	58	21	105	185	67	158	25
Future Volume (vph)	41	179	61	172	136	58	21	105	185	67	158	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	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	0.96		1.00	0.99		1.00	0.98		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		0.97	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	0.90		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1585	1600		1632	1652		1710	1574		1610	1734	
Flt Permitted	0.62	1.00		0.37	1.00		0.63	1.00		0.29	1.00	
Satd. Flow (perm)	1035	1600		642	1652		1130	1574		486	1734	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	47	203	69	195	155	66	24	119	210	76	180	28
RTOR Reduction (vph)	0	12	0	0	14	0	0	76	0	0	6	0
Lane Group Flow (vph)	47	260	0	195	207	0	24	253	0	76	202	0
Confl. Peds. (#/hr)	13		95	95		13			12	12		
Confl. Bikes (#/hr)						2						1
Heavy Vehicles (%)	7%	3%	7%	2%	4%	0%	0%	1%	1%	6%	1%	4%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	18.1	15.8		29.4	23.1		16.0	14.7		22.0	17.7	
Effective Green, g (s)	18.1	15.8		29.4	23.1		16.0	14.7		22.0	17.7	
Actuated g/C Ratio	0.29	0.25		0.47	0.37		0.26	0.24		0.35	0.28	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	0.5	0.5		0.5	0.5		0.5	0.5		0.5	0.5	
Lane Grp Cap (vph)	320	405		454	611		301	370		248	491	
v/s Ratio Prot	0.01	c0.16		c0.07	0.12		0.00	c0.16		c0.02	0.12	
v/s Ratio Perm	0.04			0.14			0.02			0.09		
v/c Ratio	0.15	0.64		0.43	0.34		0.08	0.68		0.31	0.41	
Uniform Delay, d1	16.2	20.8		10.4	14.1		17.5	21.7		14.4	18.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	2.6		0.2	0.1		0.0	4.1		0.3	0.2	
Delay (s)	16.3	23.4		10.7	14.3		17.5	25.9		14.6	18.3	
Level of Service	B	C		B	B		B	C		B	B	
Approach Delay (s)		22.3			12.6			25.3			17.3	
Approach LOS		C			B			C			B	

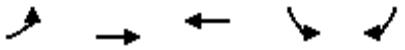
Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	62.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	179	61	172	136	58	21	105	185	67	158	25
Future Volume (veh/h)	41	179	61	172	136	58	21	105	185	67	158	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.89		0.85	0.93		0.86	0.98		0.98	0.99		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	1702	1758	1702	1772	1744	1800	1800	1786	1786	1716	1786	1744
Adj Flow Rate, veh/h	47	203	69	195	155	66	24	119	210	76	180	28
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	7	3	7	2	4	0	0	1	1	6	1	4
Cap, veh/h	428	374	127	451	424	181	353	146	258	249	433	67
Arrive On Green	0.03	0.31	0.31	0.10	0.39	0.39	0.02	0.26	0.26	0.05	0.29	0.29
Sat Flow, veh/h	1621	1194	406	1688	1100	468	1714	570	1006	1634	1499	233
Grp Volume(v), veh/h	47	0	272	195	0	221	24	0	329	76	0	208
Grp Sat Flow(s),veh/h/ln	1621	0	1599	1688	0	1568	1714	0	1576	1634	0	1732
Q Serve(g_s), s	1.3	0.0	9.0	4.6	0.0	6.5	0.7	0.0	12.6	2.2	0.0	6.2
Cycle Q Clear(g_c), s	1.3	0.0	9.0	4.6	0.0	6.5	0.7	0.0	12.6	2.2	0.0	6.2
Prop In Lane	1.00		0.25	1.00		0.30	1.00		0.64	1.00		0.13
Lane Grp Cap(c), veh/h	428	0	501	451	0	605	353	0	405	249	0	500
V/C Ratio(X)	0.11	0.00	0.54	0.43	0.00	0.37	0.07	0.00	0.81	0.31	0.00	0.42
Avail Cap(c_a), veh/h	558	0	598	675	0	782	512	0	885	348	0	972
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.3	0.0	18.2	12.3	0.0	14.1	17.3	0.0	22.4	17.6	0.0	18.4
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.2	0.0	0.1	0.0	0.0	1.5	0.3	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	3.1	1.6	0.0	2.1	0.2	0.0	4.5	0.8	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.4	0.0	18.6	12.6	0.0	14.2	17.4	0.0	23.9	17.8	0.0	18.6
LnGrp LOS	B	A	B	B	A	B	B	A	C	B	A	B
Approach Vol, veh/h		319			416			353			284	
Approach Delay, s/veh		17.9			13.5			23.5			18.4	
Approach LOS		B			B			C			B	

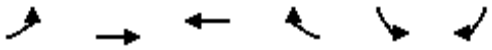
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.0	23.5	5.9	29.7	7.1	21.5	10.5	25.1
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	7.0	36.0	7.0	32.0	7.0	36.0	15.0	24.0
Max Q Clear Time (g_c+I1), s	2.7	8.2	3.3	8.5	4.2	14.6	6.6	11.0
Green Ext Time (p_c), s	0.0	0.3	0.0	0.3	0.0	0.5	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	18.1
HCM 6th LOS	B



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	174	245	383	331	260
v/c Ratio	0.39	0.26	0.71	0.72	0.44
Control Delay	8.9	7.8	22.0	27.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	7.8	22.0	27.0	5.4
Queue Length 50th (ft)	19	30	75	76	0
Queue Length 95th (ft)	63	90	208	207	47
Internal Link Dist (ft)		571	431	1342	
Turn Bay Length (ft)	75				150
Base Capacity (vph)	650	1714	1419	1202	1125
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.27	0.14	0.27	0.28	0.23

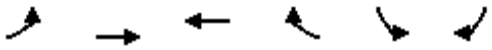
Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	158	223	217	132	301	237
Future Volume (vph)	158	223	217	132	301	237
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	5.0	5.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.95		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1710	1782	1651		1676	1468
Flt Permitted	0.32	1.00	1.00		0.95	1.00
Satd. Flow (perm)	584	1782	1651		1676	1468
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	174	245	238	145	331	260
RTOR Reduction (vph)	0	0	26	0	0	187
Lane Group Flow (vph)	174	245	357	0	331	73
Confl. Peds. (#/hr)	1			1	3	1
Heavy Vehicles (%)	0%	1%	3%	2%	2%	2%
Turn Type	pm+pt	NA	NA		pm+pt	Perm
Protected Phases	3	8	4		2	
Permitted Phases	8				6	2 6
Actuated Green, G (s)	25.1	25.1	15.4		13.2	13.2
Effective Green, g (s)	25.1	25.1	15.4		13.2	13.2
Actuated g/C Ratio	0.53	0.53	0.33		0.28	0.28
Clearance Time (s)	4.0	5.0	5.0		4.0	
Vehicle Extension (s)	0.5	0.5	0.5		0.5	
Lane Grp Cap (vph)	445	945	537		467	409
v/s Ratio Prot	c0.05	0.14	c0.22		c0.20	
v/s Ratio Perm	0.16					0.05
v/c Ratio	0.39	0.26	0.67		0.71	0.18
Uniform Delay, d1	6.5	6.0	13.7		15.3	12.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.2	0.1	2.4		4.0	0.1
Delay (s)	6.8	6.1	16.1		19.3	13.0
Level of Service	A	A	B		B	B
Approach Delay (s)		6.4	16.1		16.5	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	47.3	Sum of lost time (s)	13.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	158	223	217	132	301	237
Future Volume (veh/h)	158	223	217	132	301	237
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	1800	1786	1758	1772	1772	1772
Adj Flow Rate, veh/h	174	245	238	145	331	260
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	1	3	2	2	2
Cap, veh/h	445	897	298	181	412	366
Arrive On Green	0.10	0.50	0.29	0.29	0.24	0.24
Sat Flow, veh/h	1714	1786	1022	623	1688	1502
Grp Volume(v), veh/h	174	245	0	383	331	260
Grp Sat Flow(s),veh/h/ln	1714	1786	0	1645	1688	1502
Q Serve(g_s), s	2.2	2.8	0.0	7.6	6.5	5.6
Cycle Q Clear(g_c), s	2.2	2.8	0.0	7.6	6.5	5.6
Prop In Lane	1.00			0.38	1.00	1.00
Lane Grp Cap(c), veh/h	445	897	0	479	412	366
V/C Ratio(X)	0.39	0.27	0.00	0.80	0.80	0.71
Avail Cap(c_a), veh/h	905	2971	0	1947	1522	1355
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.7	5.1	0.0	11.6	12.6	12.3
Incr Delay (d2), s/veh	0.2	0.1	0.0	1.2	1.4	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.6	0.0	2.2	2.0	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.9	5.2	0.0	12.8	14.0	13.2
LnGrp LOS	A	A	A	B	B	B
Approach Vol, veh/h		419	383		591	
Approach Delay, s/veh		6.3	12.8		13.7	
Approach LOS		A	B		B	

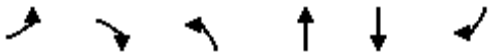
Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	12.7	7.5	15.3	22.8
Change Period (Y+Rc), s	4.0	4.0	5.0	5.0
Max Green Setting (Gmax), s	32.0	13.0	42.0	59.0
Max Q Clear Time (g_c+I1), s	8.5	4.2	9.6	4.8
Green Ext Time (p_c), s	0.1	0.0	0.6	0.3

Intersection Summary	
HCM 6th Ctrl Delay	11.2
HCM 6th LOS	B

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	18	342	404	1498	1310
v/c Ratio	0.26	0.87	0.72	0.48	0.64
Control Delay	68.9	63.3	25.4	3.0	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	68.9	63.3	25.4	3.0	18.4
Queue Length 50th (ft)	15	269	217	0	302
Queue Length 95th (ft)	42	318	m339	287	550
Internal Link Dist (ft)	1063			1080	560
Turn Bay Length (ft)	125		115		
Base Capacity (vph)	317	418	589	3111	2053
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.06	0.82	0.69	0.48	0.64

Intersection Summary

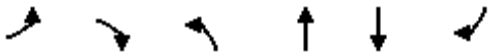
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	17	315	372	1378	1190	16
Future Volume (vph)	17	315	372	1378	1190	16
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	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)	1471	1428	1646	3292	3220	
Flt Permitted	0.95	1.00	0.14	1.00	1.00	
Satd. Flow (perm)	1471	1428	238	3292	3220	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	342	404	1498	1293	17
RTOR Reduction (vph)	0	12	0	0	0	0
Lane Group Flow (vph)	18	330	404	1498	1310	0
Confl. Peds. (#/hr)		3				
Heavy Vehicles (%)	13%	4%	1%	1%	3%	7%
Turn Type	Prot	pm+ov	pm+pt	NA	NA	
Protected Phases	8	1	1	6	2	
Permitted Phases		8	6			
Actuated Green, G (s)	2.9	34.8	116.6	116.6	80.2	
Effective Green, g (s)	2.9	34.8	116.6	116.6	80.2	
Actuated g/C Ratio	0.02	0.27	0.90	0.90	0.62	
Clearance Time (s)	4.5	4.5	4.5	6.0	6.0	
Vehicle Extension (s)	1.5	1.0	1.0	0.5	0.5	
Lane Grp Cap (vph)	32	431	558	2952	1986	
v/s Ratio Prot	0.01	c0.19	0.18	0.46	0.41	
v/s Ratio Perm		0.04	c0.47			
v/c Ratio	0.56	0.76	0.72	0.51	0.66	
Uniform Delay, d1	62.9	43.8	24.2	1.3	16.1	
Progression Factor	1.00	1.00	1.14	2.36	1.00	
Incremental Delay, d2	12.8	7.1	2.5	0.4	1.7	
Delay (s)	75.7	50.9	30.1	3.4	17.8	
Level of Service	E	D	C	A	B	
Approach Delay (s)	52.2			9.1	17.8	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

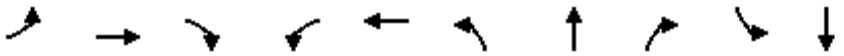
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	315	372	1378	1190	16
Future Volume (veh/h)	17	315	372	1378	1190	16
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	1573	1695	1736	1736	1709	1654
Adj Flow Rate, veh/h	18	342	404	1498	1293	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	13	4	1	1	3	7
Cap, veh/h	311	555	418	2348	1635	21
Arrive On Green	0.21	0.21	0.36	1.00	0.50	0.50
Sat Flow, veh/h	1498	1437	1654	3386	3367	43
Grp Volume(v), veh/h	18	342	404	1498	640	670
Grp Sat Flow(s),veh/h/ln	1498	1437	1654	1650	1624	1701
Q Serve(g_s), s	1.3	24.9	21.1	0.0	42.4	42.4
Cycle Q Clear(g_c), s	1.3	24.9	21.1	0.0	42.4	42.4
Prop In Lane	1.00	1.00	1.00			0.03
Lane Grp Cap(c), veh/h	311	555	418	2348	809	848
V/C Ratio(X)	0.06	0.62	0.97	0.64	0.79	0.79
Avail Cap(c_a), veh/h	324	567	523	2348	809	848
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.42	0.42	1.00	1.00
Uniform Delay (d), s/veh	41.3	32.1	23.9	0.0	27.0	27.0
Incr Delay (d2), s/veh	0.0	1.4	15.2	0.6	7.8	7.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	8.9	11.3	0.2	17.8	18.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	41.3	33.5	39.1	0.6	34.8	34.5
LnGrp LOS	D	C	D	A	C	C
Approach Vol, veh/h	360			1902	1310	
Approach Delay, s/veh	33.9			8.7	34.6	
Approach LOS	C			A	C	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	27.7	70.8				98.5	31.5
Change Period (Y+Rc), s	4.5	6.0				6.0	4.5
Max Green Setting (Gmax), s	31.5	55.4				91.4	28.1
Max Q Clear Time (g_c+I1), s	23.1	44.4				2.0	26.9
Green Ext Time (p_c), s	0.1	1.9				3.6	0.1

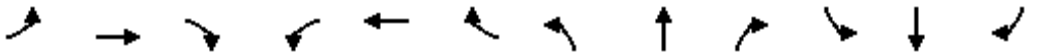
Intersection Summary			
HCM 6th Ctrl Delay		20.8	
HCM 6th LOS		C	



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	56	120	301	245	269	372	1626	227	43	1421
v/c Ratio	0.63	0.55	0.39	0.78	0.83	0.76	0.85	0.25	0.55	0.95
Control Delay	88.5	61.5	22.6	74.0	68.8	63.5	30.6	8.2	85.6	42.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.5	61.5	22.6	74.0	68.8	63.5	30.6	8.2	85.6	42.3
Queue Length 50th (ft)	47	96	68	105	210	155	605	37	36	628
Queue Length 95th (ft)	92	152	108	146	291	#252	#927	100	m55	#852
Internal Link Dist (ft)		939			288		444			1080
Turn Bay Length (ft)	150		300	75		300		200	170	
Base Capacity (vph)	127	350	850	421	446	490	1907	899	81	1492
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.34	0.35	0.58	0.60	0.76	0.85	0.25	0.53	0.95

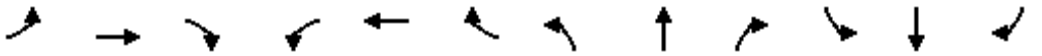
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	116	292	238	184	77	361	1577	220	42	1353	25
Future Volume (vph)	54	116	292	238	184	77	361	1577	220	42	1353	25
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	5.0	4.5		4.5	5.5	5.5	4.5	6.0	
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1630	1750	2507	3043	1646		3162	3260	1446	1583	3220	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1630	1750	2507	3043	1646		3162	3260	1446	1583	3220	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	56	120	301	245	190	79	372	1626	227	43	1395	26
RTOR Reduction (vph)	0	0	75	0	13	0	0	0	56	0	1	0
Lane Group Flow (vph)	56	120	226	245	256	0	372	1626	171	43	1420	0
Confl. Peds. (#/hr)	4		4	4		4	3		2	2		3
Confl. Bikes (#/hr)						3			2			
Heavy Vehicles (%)	2%	0%	3%	6%	1%	1%	2%	2%	0%	5%	3%	0%
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	6.5	17.1	37.3	13.4	24.5		20.2	74.3	74.3	5.7	59.3	
Effective Green, g (s)	6.5	17.1	37.3	13.4	24.5		20.2	74.3	74.3	5.7	59.3	
Actuated g/C Ratio	0.05	0.13	0.29	0.10	0.19		0.16	0.57	0.57	0.04	0.46	
Clearance Time (s)	4.5	4.5	4.5	5.0	4.5		4.5	5.5	5.5	4.5	6.0	
Vehicle Extension (s)	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lane Grp Cap (vph)	81	230	806	313	310		491	1863	826	69	1468	
v/s Ratio Prot	0.03	0.07	0.04	c0.08	c0.16		c0.12	c0.50		0.03	c0.44	
v/s Ratio Perm			0.05						0.12			
v/c Ratio	0.69	0.52	0.28	0.78	0.83		0.76	0.87	0.21	0.62	0.97	
Uniform Delay, d1	60.8	52.6	35.9	56.9	50.7		52.6	23.8	13.5	61.1	34.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.11	0.87	
Incremental Delay, d2	18.5	1.0	0.1	11.2	15.5		5.9	6.0	0.6	8.8	13.7	
Delay (s)	79.3	53.6	36.0	68.0	66.2		58.4	29.8	14.1	76.9	43.7	
Level of Service	E	D	D	E	E		E	C	B	E	D	
Approach Delay (s)		45.5			67.1			33.0			44.6	
Approach LOS		D			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	41.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	88.7%	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)	54	116	292	238	184	77	361	1577	220	42	1353	25
Future Volume (veh/h)	54	116	292	238	184	77	361	1577	220	42	1353	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	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	1723	1750	1709	1668	1736	1736	1723	1723	1750	1682	1709	1750
Adj Flow Rate, veh/h	56	120	301	245	190	79	372	1626	0	43	1395	26
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	0	3	6	1	1	2	2	0	5	3	0
Cap, veh/h	70	230	618	290	216	90	360	1924		53	1656	31
Arrive On Green	0.04	0.13	0.13	0.09	0.19	0.19	0.11	0.59	0.00	0.03	0.51	0.51
Sat Flow, veh/h	1641	1750	2510	3082	1156	481	3183	3273	1483	1602	3261	61
Grp Volume(v), veh/h	56	120	301	245	0	269	372	1626	0	43	694	727
Grp Sat Flow(s),veh/h/ln	1641	1750	1255	1541	0	1637	1591	1637	1483	1602	1624	1698
Q Serve(g_s), s	4.4	8.3	13.4	10.2	0.0	20.8	14.7	52.9	0.0	3.5	47.8	47.9
Cycle Q Clear(g_c), s	4.4	8.3	13.4	10.2	0.0	20.8	14.7	52.9	0.0	3.5	47.8	47.9
Prop In Lane	1.00		1.00	1.00		0.29	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	70	230	618	290	0	305	360	1924		53	824	862
V/C Ratio(X)	0.80	0.52	0.49	0.85	0.00	0.88	1.03	0.85		0.81	0.84	0.84
Avail Cap(c_a), veh/h	129	350	790	427	0	432	360	1924		62	824	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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	0.67	0.67	0.67
Uniform Delay (d), s/veh	61.7	52.7	42.2	58.0	0.0	51.5	57.6	22.0	0.0	62.4	27.5	27.5
Incr Delay (d2), s/veh	7.5	0.7	0.2	6.7	0.0	11.1	56.4	4.8	0.0	31.4	7.1	6.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	3.7	4.2	4.2	0.0	9.5	8.7	20.7	0.0	1.9	19.7	20.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.2	53.3	42.4	64.7	0.0	62.6	114.0	26.7	0.0	93.9	34.6	34.4
LnGrp LOS	E	D	D	E	A	E	F	C		F	C	C
Approach Vol, veh/h		477			514			1998	A		1464	
Approach Delay, s/veh		48.3			63.6			43.0			36.2	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.2	72.0	10.1	28.7	8.8	82.4	17.2	21.6
Change Period (Y+Rc), s	4.5	6.0	4.5	4.5	4.5	* 6	5.0	4.5
Max Green Setting (Gmax), s	14.7	51.3	10.2	34.3	5.0	* 62	18.0	26.0
Max Q Clear Time (g_c+I1), s	16.7	49.9	6.4	22.8	5.5	54.9	12.2	15.4
Green Ext Time (p_c), s	0.0	0.6	0.0	0.3	0.0	2.6	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	43.7
HCM 6th LOS	D

Notes

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

User approved changes to right turn type.

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

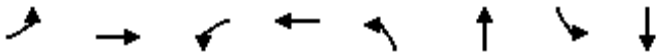
Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	185	124	205	112	11	8	0	165	8	1	5
Future Vol, veh/h	2	185	124	205	112	11	8	0	165	8	1	5
Conflicting Peds, #/hr	0	0	13	13	0	0	7	0	0	0	0	7
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	110	-	-	225	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	66	66	66	66	66	66	66	66	66	66	66	66
Heavy Vehicles, %	0	9	0	11	0	100	0	0	0	0	0	0
Mvmt Flow	3	280	188	311	170	17	12	0	250	12	2	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	187	0	0	481	0	0	1206	1202	387	1306	1288	186
Stage 1	-	-	-	-	-	-	393	393	-	801	801	-
Stage 2	-	-	-	-	-	-	813	809	-	505	487	-
Critical Hdwy	4.1	-	-	4.21	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.299	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1399	-	-	1036	-	-	162	186	665	138	165	861
Stage 1	-	-	-	-	-	-	636	609	-	381	400	-
Stage 2	-	-	-	-	-	-	375	396	-	553	554	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1399	-	-	1023	-	-	119	128	657	65	113	855
Mov Cap-2 Maneuver	-	-	-	-	-	-	119	128	-	65	113	-
Stage 1	-	-	-	-	-	-	627	600	-	380	278	-
Stage 2	-	-	-	-	-	-	256	276	-	342	546	-

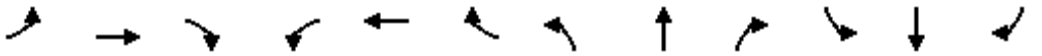
Approach	EB	WB	NB	SB
HCM Control Delay, s	0	6.3	15	49.3
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	119	657	1399	-	-	1023	-	-	102
HCM Lane V/C Ratio	0.102	0.381	0.002	-	-	0.304	-	-	0.208
HCM Control Delay (s)	38.7	13.8	7.6	-	-	10	-	-	49.3
HCM Lane LOS	E	B	A	-	-	B	-	-	E
HCM 95th %tile Q(veh)	0.3	1.8	0	-	-	1.3	-	-	0.7



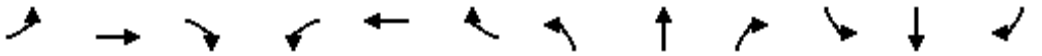
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	69	288	334	284	29	341	52	266
v/c Ratio	0.20	0.76	0.58	0.36	0.11	0.82	0.25	0.61
Control Delay	13.0	40.0	15.0	16.5	18.6	37.7	20.6	30.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	40.0	15.0	16.5	18.6	37.7	20.6	30.3
Queue Length 50th (ft)	13	112	78	81	8	104	14	81
Queue Length 95th (ft)	40	232	171	175	28	235	44	211
Internal Link Dist (ft)		872		1419		1586		230
Turn Bay Length (ft)	190		200		200		110	
Base Capacity (vph)	399	830	705	1159	299	783	238	811
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.35	0.47	0.25	0.10	0.44	0.22	0.33

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	215	36	291	203	44	25	109	188	45	193	38
Future Volume (vph)	60	215	36	291	203	44	25	109	188	45	193	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	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	0.99		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.90		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1536	1632		1653	1674		1561	1556		1525	1683	
Flt Permitted	0.59	1.00		0.35	1.00		0.48	1.00		0.27	1.00	
Satd. Flow (perm)	947	1632		605	1674		794	1556		428	1683	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	69	247	41	334	233	51	29	125	216	52	222	44
RTOR Reduction (vph)	0	6	0	0	8	0	0	66	0	0	8	0
Lane Group Flow (vph)	69	282	0	334	276	0	29	275	0	52	258	0
Confl. Peds. (#/hr)	5		16	16		5	10		5	5		10
Confl. Bikes (#/hr)						1						1
Heavy Vehicles (%)	11%	6%	15%	3%	5%	0%	9%	6%	1%	12%	1%	17%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	20.6	18.0		37.4	30.8		17.3	15.8		19.7	17.0	
Effective Green, g (s)	20.6	18.0		37.4	30.8		17.3	15.8		19.7	17.0	
Actuated g/C Ratio	0.29	0.26		0.54	0.44		0.25	0.23		0.28	0.24	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	0.5	0.5		0.5	0.5		0.5	0.5		0.5	0.5	
Lane Grp Cap (vph)	300	420		554	737		212	351		162	409	
v/s Ratio Prot	0.01	0.17		c0.13	0.16		0.00	c0.18		c0.01	0.15	
v/s Ratio Perm	0.06			c0.19			0.03			0.08		
v/c Ratio	0.23	0.67		0.60	0.37		0.14	0.78		0.32	0.63	
Uniform Delay, d1	18.2	23.3		10.3	13.1		20.2	25.4		19.3	23.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	3.3		1.3	0.1		0.1	10.1		0.4	2.3	
Delay (s)	18.3	26.6		11.6	13.2		20.3	35.6		19.7	26.0	
Level of Service	B	C		B	B		C	D		B	C	
Approach Delay (s)		25.0			12.3			34.4			25.0	
Approach LOS		C			B			C			C	

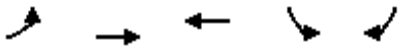
Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	69.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	215	36	291	203	44	25	109	188	45	193	38
Future Volume (veh/h)	60	215	36	291	203	44	25	109	188	45	193	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.97	0.99		0.96	0.99		0.98	0.99		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	1646	1716	1589	1758	1730	1800	1674	1716	1786	1632	1786	1561
Adj Flow Rate, veh/h	69	247	41	334	233	51	29	125	216	52	222	44
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	11	6	15	3	5	0	9	6	1	12	1	17
Cap, veh/h	405	337	56	482	495	108	296	150	258	219	406	80
Arrive On Green	0.05	0.24	0.24	0.17	0.36	0.36	0.02	0.27	0.27	0.03	0.28	0.28
Sat Flow, veh/h	1567	1427	237	1674	1362	298	1594	557	963	1554	1437	285
Grp Volume(v), veh/h	69	0	288	334	0	284	29	0	341	52	0	266
Grp Sat Flow(s),veh/h/ln	1567	0	1663	1674	0	1660	1594	0	1521	1554	0	1721
Q Serve(g_s), s	2.1	0.0	9.9	8.7	0.0	8.2	0.8	0.0	13.1	1.5	0.0	8.1
Cycle Q Clear(g_c), s	2.1	0.0	9.9	8.7	0.0	8.2	0.8	0.0	13.1	1.5	0.0	8.1
Prop In Lane	1.00		0.14	1.00		0.18	1.00		0.63	1.00		0.17
Lane Grp Cap(c), veh/h	405	0	393	482	0	603	296	0	408	219	0	486
V/C Ratio(X)	0.17	0.00	0.73	0.69	0.00	0.47	0.10	0.00	0.84	0.24	0.00	0.55
Avail Cap(c_a), veh/h	491	0	777	733	0	1144	409	0	666	312	0	759
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.8	0.0	21.9	13.8	0.0	15.2	16.5	0.0	21.4	17.1	0.0	18.9
Incr Delay (d2), s/veh	0.1	0.0	1.0	0.7	0.0	0.2	0.1	0.0	2.2	0.2	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	3.7	2.9	0.0	2.8	0.3	0.0	4.5	0.5	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.8	0.0	22.9	14.5	0.0	15.4	16.6	0.0	23.7	17.4	0.0	19.3
LnGrp LOS	B	A	C	B	A	B	B	A	C	B	A	B
Approach Vol, veh/h		357			618			370			318	
Approach Delay, s/veh		21.7			14.9			23.1			19.0	
Approach LOS		C			B			C			B	

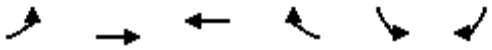
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.2	22.6	6.8	27.6	6.1	21.7	14.7	19.7
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	5.6	27.4	6.2	42.8	5.8	27.2	20.0	29.0
Max Q Clear Time (g_c+I1), s	2.8	10.1	4.1	10.2	3.5	15.1	10.7	11.9
Green Ext Time (p_c), s	0.0	0.3	0.0	0.4	0.0	0.5	0.1	0.4

Intersection Summary	
HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	320	254	396	325	275
v/c Ratio	0.61	0.25	0.77	0.74	0.46
Control Delay	12.1	7.5	25.8	31.4	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	7.5	25.8	31.4	5.8
Queue Length 50th (ft)	47	38	88	96	0
Queue Length 95th (ft)	115	92	222	224	52
Internal Link Dist (ft)		571	431	1342	
Turn Bay Length (ft)	75				150
Base Capacity (vph)	634	1463	847	1374	1282
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.50	0.17	0.47	0.24	0.21

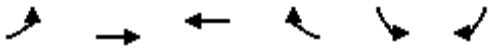
Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	294	234	123	241	299	253
Future Volume (vph)	294	234	123	241	299	253
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	5.0	5.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.91		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1692	1782	1539		1693	1515
Flt Permitted	0.27	1.00	1.00		0.95	1.00
Satd. Flow (perm)	488	1782	1539		1693	1515
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	320	254	134	262	325	275
RTOR Reduction (vph)	0	0	67	0	0	202
Lane Group Flow (vph)	320	254	329	0	325	73
Confl. Peds. (#/hr)	4			4		
Heavy Vehicles (%)	1%	1%	8%	3%	1%	1%
Turn Type	pm+pt	NA	NA		pm+pt	Perm
Protected Phases	3	8	4		2	
Permitted Phases	8				6	2 6
Actuated Green, G (s)	31.7	31.7	16.6		14.6	14.6
Effective Green, g (s)	31.7	31.7	16.6		14.6	14.6
Actuated g/C Ratio	0.57	0.57	0.30		0.26	0.26
Clearance Time (s)	4.0	5.0	5.0		4.0	
Vehicle Extension (s)	0.5	0.5	0.5		0.5	
Lane Grp Cap (vph)	521	1021	461		446	399
v/s Ratio Prot	c0.12	0.14	c0.21		c0.19	
v/s Ratio Perm	0.23					0.05
v/c Ratio	0.61	0.25	0.71		0.73	0.18
Uniform Delay, d1	7.6	5.9	17.2		18.5	15.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.5	0.0	4.3		5.0	0.1
Delay (s)	9.1	5.9	21.6		23.5	15.8
Level of Service	A	A	C		C	B
Approach Delay (s)		7.7	21.6		20.0	
Approach LOS		A	C		C	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	55.3	Sum of lost time (s)	13.0
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	294	234	123	241	299	253
Future Volume (veh/h)	294	234	123	241	299	253
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.99	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	1786	1786	1688	1758	1786	1786
Adj Flow Rate, veh/h	320	254	134	262	325	275
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	8	3	1	1
Cap, veh/h	495	1004	159	312	392	349
Arrive On Green	0.16	0.56	0.31	0.31	0.23	0.23
Sat Flow, veh/h	1701	1786	508	993	1701	1514
Grp Volume(v), veh/h	320	254	0	396	325	275
Grp Sat Flow(s),veh/h/ln	1701	1786	0	1501	1701	1514
Q Serve(g_s), s	4.9	3.2	0.0	10.7	7.9	7.4
Cycle Q Clear(g_c), s	4.9	3.2	0.0	10.7	7.9	7.4
Prop In Lane	1.00			0.66	1.00	1.00
Lane Grp Cap(c), veh/h	495	1004	0	471	392	349
V/C Ratio(X)	0.65	0.25	0.00	0.84	0.83	0.79
Avail Cap(c_a), veh/h	817	1891	0	933	1762	1568
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.8	4.9	0.0	13.9	15.9	15.7
Incr Delay (d2), s/veh	0.5	0.0	0.0	1.6	1.7	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.7	0.0	3.1	2.8	2.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.3	4.9	0.0	15.5	17.6	17.2
LnGrp LOS	A	A	A	B	B	B
Approach Vol, veh/h		574	396		600	
Approach Delay, s/veh		7.4	15.5		17.4	
Approach LOS		A	B		B	

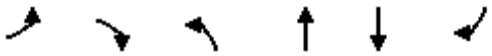
Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	14.0	10.8	18.6	29.4
Change Period (Y+Rc), s	4.0	4.0	5.0	5.0
Max Green Setting (Gmax), s	45.0	15.0	27.0	46.0
Max Q Clear Time (g_c+I1), s	9.9	6.9	12.7	5.2
Green Ext Time (p_c), s	0.1	0.1	0.6	0.3

Intersection Summary	
HCM 6th Ctrl Delay	13.3
HCM 6th LOS	B

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	17	475	287	977	1317
v/c Ratio	0.25	0.91	0.46	0.33	0.71
Control Delay	68.6	59.7	21.8	2.7	25.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	68.6	59.7	21.8	2.7	25.2
Queue Length 50th (ft)	14	384	144	0	372
Queue Length 95th (ft)	40	425	293	207	#656
Internal Link Dist (ft)	1063			1080	560
Turn Bay Length (ft)	125		115		
Base Capacity (vph)	317	522	622	2995	1850
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.05	0.91	0.46	0.33	0.71

Intersection Summary

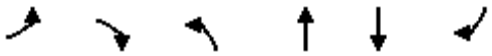
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	16	437	264	899	1201	11
Future Volume (vph)	16	437	264	899	1201	11
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	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)	1471	1458	1614	3167	3244	
Flt Permitted	0.95	1.00	0.11	1.00	1.00	
Satd. Flow (perm)	1471	1458	190	3167	3244	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	475	287	977	1305	12
RTOR Reduction (vph)	0	14	0	0	0	0
Lane Group Flow (vph)	17	461	287	977	1317	0
Confl. Peds. (#/hr)	2					
Heavy Vehicles (%)	13%	2%	3%	5%	2%	40%
Turn Type	Prot	pm+ov	pm+pt	NA	NA	
Protected Phases	8	1	1	6	2	
Permitted Phases		8	6			
Actuated Green, G (s)	2.9	43.6	116.6	116.6	71.4	
Effective Green, g (s)	2.9	43.6	116.6	116.6	71.4	
Actuated g/C Ratio	0.02	0.34	0.90	0.90	0.55	
Clearance Time (s)	4.5	4.5	4.5	6.0	6.0	
Vehicle Extension (s)	1.5	1.0	1.0	0.5	0.5	
Lane Grp Cap (vph)	32	539	616	2840	1781	
v/s Ratio Prot	0.01	c0.27	0.15	0.31	c0.41	
v/s Ratio Perm		0.05	0.27			
v/c Ratio	0.53	0.86	0.47	0.34	0.74	
Uniform Delay, d1	62.9	40.3	18.9	1.0	22.2	
Progression Factor	1.00	1.00	1.69	2.83	1.00	
Incremental Delay, d2	8.2	12.1	0.2	0.3	2.8	
Delay (s)	71.1	52.4	32.0	3.1	25.0	
Level of Service	E	D	C	A	C	
Approach Delay (s)	53.1			9.6	25.0	
Approach LOS	D			A	C	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		

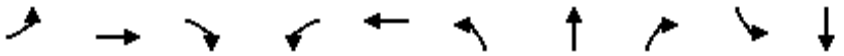
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	437	264	899	1201	11
Future Volume (veh/h)	16	437	264	899	1201	11
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	1573	1723	1709	1682	1723	1204
Adj Flow Rate, veh/h	17	475	287	977	1305	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	13	2	3	5	2	40
Cap, veh/h	324	452	322	2247	1911	18
Arrive On Green	0.22	0.22	0.19	1.00	0.57	0.57
Sat Flow, veh/h	1498	1460	1628	3279	3409	31
Grp Volume(v), veh/h	17	475	287	977	643	674
Grp Sat Flow(s),veh/h/ln	1498	1460	1628	1598	1637	1717
Q Serve(g_s), s	1.2	28.1	10.0	0.0	35.7	35.7
Cycle Q Clear(g_c), s	1.2	28.1	10.0	0.0	35.7	35.7
Prop In Lane	1.00	1.00	1.00			0.02
Lane Grp Cap(c), veh/h	324	452	322	2247	941	987
V/C Ratio(X)	0.05	1.05	0.89	0.43	0.68	0.68
Avail Cap(c_a), veh/h	324	452	529	2247	941	987
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.70	0.70	1.00	1.00
Uniform Delay (d), s/veh	40.4	44.9	19.8	0.0	19.3	19.3
Incr Delay (d2), s/veh	0.0	56.3	4.6	0.4	4.0	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	21.5	5.2	0.1	14.2	14.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	40.4	101.1	24.4	0.4	23.3	23.2
LnGrp LOS	D	F	C	A	C	C
Approach Vol, veh/h	492			1264	1317	
Approach Delay, s/veh	99.0			5.9	23.3	
Approach LOS	F			A	C	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	16.7	80.7				97.4	32.6
Change Period (Y+Rc), s	4.5	6.0				6.0	4.5
Max Green Setting (Gmax), s	28.7	58.2				91.4	28.1
Max Q Clear Time (g_c+I1), s	12.0	37.7				2.0	30.1
Green Ext Time (p_c), s	0.1	2.1				2.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	28.2
HCM 6th LOS	C



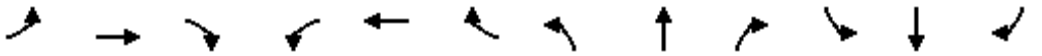
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	65	119	642	169	73	157	1168	89	17	1615
v/c Ratio	0.66	0.32	0.81	0.72	0.18	0.75	0.66	0.10	0.34	1.02
Control Delay	88.4	44.6	42.0	74.9	33.0	81.8	24.2	1.2	78.9	55.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.4	44.6	42.0	74.9	33.0	81.8	24.2	1.2	78.9	55.2
Queue Length 50th (ft)	55	84	219	72	41	67	328	0	14	~811
Queue Length 95th (ft)	103	141	309	109	82	#142	516	11	m20	#933
Internal Link Dist (ft)		939			288		444			1080
Turn Bay Length (ft)	150		300	75		300		200	170	
Base Capacity (vph)	141	388	807	417	409	208	1776	883	60	1579
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.31	0.80	0.41	0.18	0.75	0.66	0.10	0.28	1.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

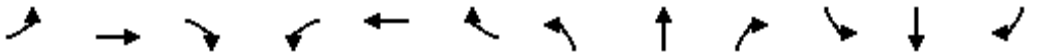
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	111	597	157	51	17	146	1086	83	16	1490	12
Future Volume (vph)	60	111	597	157	51	17	146	1086	83	16	1490	12
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	5.0	4.5		4.5	5.5	5.5	4.5	6.0	
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.99		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1662	1750	2542	3014	1549		3162	3167	1473	1554	3249	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1662	1750	2542	3014	1549		3162	3167	1473	1554	3249	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	65	119	642	169	55	18	157	1168	89	17	1602	13
RTOR Reduction (vph)	0	0	75	0	9	0	0	0	41	0	1	0
Lane Group Flow (vph)	65	119	567	169	64	0	157	1168	48	17	1614	0
Confl. Peds. (#/hr)	7		2	2		7	7					7
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	0%	0%	1%	7%	7%	12%	2%	5%	1%	7%	2%	27%
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	7.0	28.9	37.5	10.2	32.6		8.6	69.4	69.4	2.0	62.3	
Effective Green, g (s)	7.0	28.9	37.5	10.2	32.6		8.6	69.4	69.4	2.0	62.3	
Actuated g/C Ratio	0.05	0.22	0.29	0.08	0.25		0.07	0.53	0.53	0.02	0.48	
Clearance Time (s)	4.5	4.5	4.5	5.0	4.5		4.5	5.5	5.5	4.5	6.0	
Vehicle Extension (s)	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lane Grp Cap (vph)	89	389	821	236	388		209	1690	786	23	1557	
v/s Ratio Prot	0.04	0.07	c0.05	c0.06	c0.04		c0.05	0.37		0.01	c0.50	
v/s Ratio Perm			0.18						0.03			
v/c Ratio	0.73	0.31	0.69	0.72	0.16		0.75	0.69	0.06	0.74	1.04	
Uniform Delay, d1	60.6	42.2	41.1	58.5	38.1		59.6	22.4	14.6	63.7	33.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.10	0.91	
Incremental Delay, d2	23.0	0.2	2.0	8.3	0.1		12.6	2.3	0.1	48.8	28.4	
Delay (s)	83.6	42.3	43.1	66.8	38.1		72.3	24.7	14.7	118.8	59.3	
Level of Service	F	D	D	E	D		E	C	B	F	E	
Approach Delay (s)		46.2			58.2			29.4			60.0	
Approach LOS		D			E			C			E	

Intersection Summary			
HCM 2000 Control Delay	46.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	85.8%	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)	60	111	597	157	51	17	146	1086	83	16	1490	12
Future Volume (veh/h)	60	111	597	157	51	17	146	1086	83	16	1490	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1736	1654	1654	1586	1723	1682	1736	1654	1723	1381
Adj Flow Rate, veh/h	65	119	642	169	55	18	157	1168	0	17	1602	13
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	1	7	7	12	2	5	1	7	2	27
Cap, veh/h	81	350	642	214	268	88	164	1803		19	1745	14
Arrive On Green	0.05	0.20	0.20	0.07	0.22	0.22	0.05	0.56	0.00	0.02	0.70	0.70
Sat Flow, veh/h	1667	1750	2544	3057	1190	390	3183	3195	1471	1576	3327	27
Grp Volume(v), veh/h	65	119	642	169	0	73	157	1168	0	17	788	827
Grp Sat Flow(s),veh/h/ln	1667	1750	1272	1528	0	1580	1591	1598	1471	1576	1637	1717
Q Serve(g_s), s	5.0	7.6	26.0	7.1	0.0	4.9	6.4	32.6	0.0	1.4	52.5	52.7
Cycle Q Clear(g_c), s	5.0	7.6	26.0	7.1	0.0	4.9	6.4	32.6	0.0	1.4	52.5	52.7
Prop In Lane	1.00		1.00	1.00		0.25	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	81	350	642	214	0	355	164	1803		19	859	901
V/C Ratio(X)	0.80	0.34	1.00	0.79	0.00	0.21	0.96	0.65		0.90	0.92	0.92
Avail Cap(c_a), veh/h	142	350	642	423	0	406	164	1803		62	859	901
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	0.56	0.56	0.56
Uniform Delay (d), s/veh	61.2	44.6	48.7	59.5	0.0	40.9	61.5	19.5	0.0	63.9	17.3	17.3
Incr Delay (d2), s/veh	6.5	0.2	35.4	2.5	0.0	0.1	57.0	1.8	0.0	24.6	10.2	9.9
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	2.3	3.3	13.5	2.8	0.0	1.9	3.9	12.3	0.0	0.7	17.9	18.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.7	44.8	84.0	62.0	0.0	41.0	118.5	21.3	0.0	88.5	27.5	27.2
LnGrp LOS	E	D	F	E	A	D	F	C		F	C	C
Approach Vol, veh/h		826			242			1325	A		1632	
Approach Delay, s/veh		77.1			55.7			32.8			28.0	
Approach LOS		E			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	74.2	10.9	33.7	6.1	79.3	14.1	30.5
Change Period (Y+Rc), s	4.5	6.0	4.5	4.5	4.5	* 6	5.0	4.5
Max Green Setting (Gmax), s	6.7	59.3	11.1	33.4	5.1	* 61	18.0	26.0
Max Q Clear Time (g_c+I1), s	8.4	54.7	7.0	6.9	3.4	34.6	9.1	28.0
Green Ext Time (p_c), s	0.0	1.7	0.0	0.1	0.0	2.6	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	41.3
HCM 6th LOS	D

Notes

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

User approved changes to right turn type.

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

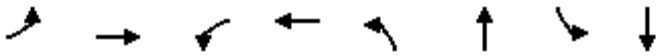
Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	181	19	76	165	8	23	2	127	13	0	3
Future Vol, veh/h	0	181	19	76	165	8	23	2	127	13	0	3
Conflicting Peds, #/hr	0	0	37	37	0	0	12	0	0	0	0	12
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	110	-	-	225	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	58	58	58	58	58	58	58	58	58	58	58	58
Heavy Vehicles, %	0	9	0	3	7	0	0	0	0	0	0	0
Mvmt Flow	0	312	33	131	284	14	40	3	219	22	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	298	0	0	382	0	0	934	926	366	993	935	303
Stage 1	-	-	-	-	-	-	366	366	-	553	553	-
Stage 2	-	-	-	-	-	-	568	560	-	440	382	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1275	-	-	1171	-	-	248	271	684	226	267	741
Stage 1	-	-	-	-	-	-	657	626	-	521	518	-
Stage 2	-	-	-	-	-	-	511	514	-	600	616	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1275	-	-	1130	-	-	214	231	660	136	228	733
Mov Cap-2 Maneuver	-	-	-	-	-	-	214	231	-	136	228	-
Stage 1	-	-	-	-	-	-	634	604	-	521	458	-
Stage 2	-	-	-	-	-	-	443	454	-	399	594	-

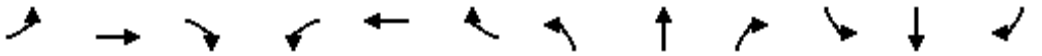
Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.6	15.2	31.9
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	215	660	1275	-	-	1130	-	-	161
HCM Lane V/C Ratio	0.2	0.332	-	-	-	0.116	-	-	0.171
HCM Control Delay (s)	25.9	13.1	0	-	-	8.6	-	-	31.9
HCM Lane LOS	D	B	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0.7	1.5	0	-	-	0.4	-	-	0.6



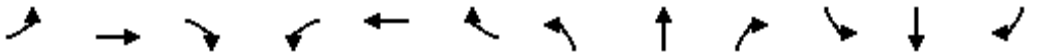
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	50	294	211	239	26	355	82	225
v/c Ratio	0.14	0.78	0.47	0.36	0.07	0.81	0.31	0.42
Control Delay	13.0	39.4	15.3	17.8	14.7	33.1	17.4	21.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	39.4	15.3	17.8	14.7	33.1	17.4	21.4
Queue Length 50th (ft)	10	101	47	63	6	94	19	57
Queue Length 95th (ft)	34	231	114	152	23	217	54	156
Internal Link Dist (ft)		896		1419		1586		230
Turn Bay Length (ft)	190		200		200		110	
Base Capacity (vph)	456	688	574	956	447	1007	305	1078
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.43	0.37	0.25	0.06	0.35	0.27	0.21

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	193	66	186	147	63	23	113	200	72	171	27
Future Volume (vph)	44	193	66	186	147	63	23	113	200	72	171	27
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	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	0.96		1.00	0.99		1.00	0.98		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		0.98	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	0.90		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1585	1596		1636	1651		1710	1572		1610	1733	
Flt Permitted	0.61	1.00		0.35	1.00		0.62	1.00		0.26	1.00	
Satd. Flow (perm)	1018	1596		598	1651		1112	1572		434	1733	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	50	219	75	211	167	72	26	128	227	82	194	31
RTOR Reduction (vph)	0	12	0	0	14	0	0	75	0	0	6	0
Lane Group Flow (vph)	50	282	0	211	225	0	26	280	0	82	219	0
Confl. Peds. (#/hr)	13		95	95		13			12	12		
Confl. Bikes (#/hr)						2						1
Heavy Vehicles (%)	7%	3%	7%	2%	4%	0%	0%	1%	1%	6%	1%	4%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	19.9	17.5		31.8	25.4		17.9	16.5		24.1	19.6	
Effective Green, g (s)	19.9	17.5		31.8	25.4		17.9	16.5		24.1	19.6	
Actuated g/C Ratio	0.30	0.26		0.48	0.38		0.27	0.25		0.36	0.29	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	0.5	0.5		0.5	0.5		0.5	0.5		0.5	0.5	
Lane Grp Cap (vph)	323	418		444	627		310	388		235	508	
v/s Ratio Prot	0.01	c0.18		c0.07	0.14		0.00	c0.18		c0.02	0.13	
v/s Ratio Perm	0.04			0.15			0.02			0.10		
v/c Ratio	0.15	0.68		0.48	0.36		0.08	0.72		0.35	0.43	
Uniform Delay, d1	17.0	22.1		11.2	14.9		18.2	23.0		15.3	19.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	3.4		0.3	0.1		0.0	5.5		0.3	0.2	
Delay (s)	17.1	25.5		11.5	15.0		18.2	28.5		15.6	19.3	
Level of Service	B	C		B	B		B	C		B	B	
Approach Delay (s)		24.3			13.4			27.8			18.3	
Approach LOS		C			B			C			B	

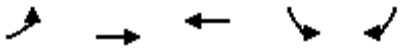
Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	66.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	193	66	186	147	63	23	113	200	72	171	27
Future Volume (veh/h)	44	193	66	186	147	63	23	113	200	72	171	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.89		0.84	0.93		0.86	0.99		0.98	0.99		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	1702	1758	1702	1772	1744	1800	1800	1786	1786	1716	1786	1744
Adj Flow Rate, veh/h	50	219	75	211	167	72	26	128	227	82	194	31
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	7	3	7	2	4	0	0	1	1	6	1	4
Cap, veh/h	409	363	124	432	418	180	353	152	269	242	450	72
Arrive On Green	0.03	0.31	0.31	0.11	0.38	0.38	0.02	0.27	0.27	0.05	0.30	0.30
Sat Flow, veh/h	1621	1189	407	1688	1094	472	1714	569	1008	1634	1493	239
Grp Volume(v), veh/h	50	0	294	211	0	239	26	0	355	82	0	225
Grp Sat Flow(s),veh/h/ln	1621	0	1596	1688	0	1566	1714	0	1577	1634	0	1731
Q Serve(g_s), s	1.4	0.0	10.5	5.3	0.0	7.5	0.7	0.0	14.3	2.4	0.0	7.0
Cycle Q Clear(g_c), s	1.4	0.0	10.5	5.3	0.0	7.5	0.7	0.0	14.3	2.4	0.0	7.0
Prop In Lane	1.00		0.26	1.00		0.30	1.00		0.64	1.00		0.14
Lane Grp Cap(c), veh/h	409	0	488	432	0	599	353	0	421	242	0	522
V/C Ratio(X)	0.12	0.00	0.60	0.49	0.00	0.40	0.07	0.00	0.84	0.34	0.00	0.43
Avail Cap(c_a), veh/h	528	0	571	627	0	747	502	0	846	328	0	929
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.3	0.0	19.8	13.4	0.0	15.1	17.6	0.0	23.3	17.9	0.0	18.8
Incr Delay (d2), s/veh	0.0	0.0	0.6	0.3	0.0	0.2	0.0	0.0	1.8	0.3	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	3.7	1.8	0.0	2.5	0.3	0.0	5.1	0.9	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.3	0.0	20.4	13.7	0.0	15.3	17.7	0.0	25.1	18.2	0.0	19.0
LnGrp LOS	B	A	C	B	A	B	B	A	C	B	A	B
Approach Vol, veh/h		344			450			381			307	
Approach Delay, s/veh		19.7			14.5			24.5			18.8	
Approach LOS		B			B			C			B	

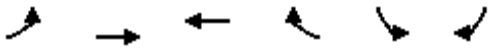
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.2	25.2	6.1	30.7	7.4	22.9	11.2	25.5
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	7.0	36.0	7.0	32.0	7.0	36.0	15.0	24.0
Max Q Clear Time (g_c+I1), s	2.7	9.0	3.4	9.5	4.4	16.3	7.3	12.5
Green Ext Time (p_c), s	0.0	0.3	0.0	0.4	0.0	0.6	0.0	0.4

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



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	188	265	414	357	281
v/c Ratio	0.43	0.28	0.74	0.75	0.46
Control Delay	10.1	8.5	23.9	29.8	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.1	8.5	23.9	29.8	5.4
Queue Length 50th (ft)	24	37	91	91	0
Queue Length 95th (ft)	75	108	250	247	51
Internal Link Dist (ft)		571	431	1342	
Turn Bay Length (ft)	75				150
Base Capacity (vph)	615	1675	1349	1127	1078
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.31	0.16	0.31	0.32	0.26

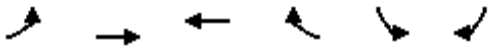
Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	171	241	234	143	325	256
Future Volume (vph)	171	241	234	143	325	256
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	5.0	5.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.95		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1710	1782	1651		1676	1468
Flt Permitted	0.30	1.00	1.00		0.95	1.00
Satd. Flow (perm)	538	1782	1651		1676	1468
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	188	265	257	157	357	281
RTOR Reduction (vph)	0	0	25	0	0	200
Lane Group Flow (vph)	188	265	389	0	357	81
Confl. Peds. (#/hr)	1			1	3	1
Heavy Vehicles (%)	0%	1%	3%	2%	2%	2%
Turn Type	pm+pt	NA	NA		pm+pt	Perm
Protected Phases	3	8	4		2	
Permitted Phases	8				6	2 6
Actuated Green, G (s)	27.8	27.8	17.6		14.9	14.9
Effective Green, g (s)	27.8	27.8	17.6		14.9	14.9
Actuated g/C Ratio	0.54	0.54	0.34		0.29	0.29
Clearance Time (s)	4.0	5.0	5.0		4.0	
Vehicle Extension (s)	0.5	0.5	0.5		0.5	
Lane Grp Cap (vph)	429	958	562		483	423
v/s Ratio Prot	c0.05	0.15	c0.24		c0.21	
v/s Ratio Perm	0.18					0.06
v/c Ratio	0.44	0.28	0.69		0.74	0.19
Uniform Delay, d1	7.2	6.5	14.7		16.6	13.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.3	0.1	3.0		5.1	0.1
Delay (s)	7.5	6.5	17.7		21.7	13.9
Level of Service	A	A	B		C	B
Approach Delay (s)		6.9	17.7		18.3	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	51.7	Sum of lost time (s)	13.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	171	241	234	143	325	256
Future Volume (veh/h)	171	241	234	143	325	256
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	1800	1786	1758	1772	1772	1772
Adj Flow Rate, veh/h	188	265	257	157	357	281
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	1	3	2	2	2
Cap, veh/h	430	914	311	190	430	383
Arrive On Green	0.10	0.51	0.31	0.31	0.26	0.26
Sat Flow, veh/h	1714	1786	1021	624	1688	1502
Grp Volume(v), veh/h	188	265	0	414	357	281
Grp Sat Flow(s),veh/h/ln	1714	1786	0	1644	1688	1502
Q Serve(g_s), s	2.6	3.3	0.0	9.0	7.7	6.6
Cycle Q Clear(g_c), s	2.6	3.3	0.0	9.0	7.7	6.6
Prop In Lane	1.00			0.38	1.00	1.00
Lane Grp Cap(c), veh/h	430	914	0	502	430	383
V/C Ratio(X)	0.44	0.29	0.00	0.83	0.83	0.73
Avail Cap(c_a), veh/h	830	2728	0	1788	1398	1244
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.3	5.4	0.0	12.5	13.6	13.2
Incr Delay (d2), s/veh	0.3	0.1	0.0	1.3	1.6	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.7	0.0	2.7	2.5	1.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.6	5.5	0.0	13.8	15.2	14.2
LnGrp LOS	A	A	A	B	B	B
Approach Vol, veh/h		453	414		638	
Approach Delay, s/veh		6.7	13.8		14.8	
Approach LOS		A	B		B	

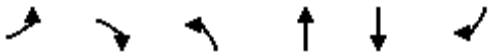
Timer - Assigned Phs	2	3	4			8
Phs Duration (G+Y+Rc), s	13.9	8.0	16.8			24.8
Change Period (Y+Rc), s	4.0	4.0	5.0			5.0
Max Green Setting (Gmax), s	32.0	13.0	42.0			59.0
Max Q Clear Time (g_c+I1), s	9.7	4.6	11.0			5.3
Green Ext Time (p_c), s	0.1	0.0	0.7			0.4

Intersection Summary	
HCM 6th Ctrl Delay	12.1
HCM 6th LOS	B

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	20	370	437	1617	1415
v/c Ratio	0.29	0.84	0.78	0.53	0.74
Control Delay	69.8	57.3	35.5	4.7	24.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	69.8	57.3	35.5	4.7	24.1
Queue Length 50th (ft)	17	260	308	228	467
Queue Length 95th (ft)	44	344	m352	m301	655
Internal Link Dist (ft)	1063			1080	560
Turn Bay Length (ft)	125		115		
Base Capacity (vph)	317	449	568	3027	1922
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.06	0.82	0.77	0.53	0.74

Intersection Summary

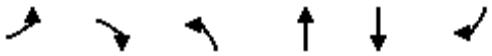
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	18	340	402	1488	1285	17
Future Volume (vph)	18	340	402	1488	1285	17
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	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)	1471	1428	1646	3292	3220	
Flt Permitted	0.95	1.00	0.10	1.00	1.00	
Satd. Flow (perm)	1471	1428	177	3292	3220	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	370	437	1617	1397	18
RTOR Reduction (vph)	0	8	0	0	0	0
Lane Group Flow (vph)	20	362	437	1617	1415	0
Confl. Peds. (#/hr)		3				
Heavy Vehicles (%)	13%	4%	1%	1%	3%	7%
Turn Type	Prot	pm+ov	pm+pt	NA	NA	
Protected Phases	8	1	1	6	2	
Permitted Phases		8	6			
Actuated Green, G (s)	4.2	39.3	115.3	115.3	75.7	
Effective Green, g (s)	4.2	39.3	115.3	115.3	75.7	
Actuated g/C Ratio	0.03	0.30	0.89	0.89	0.58	
Clearance Time (s)	4.5	4.5	4.5	6.0	6.0	
Vehicle Extension (s)	1.5	1.0	1.0	0.5	0.5	
Lane Grp Cap (vph)	47	481	553	2919	1875	
v/s Ratio Prot	0.01	c0.20	0.21	0.49	0.44	
v/s Ratio Perm		0.05	c0.49			
v/c Ratio	0.43	0.75	0.79	0.55	0.75	
Uniform Delay, d1	61.7	40.9	31.0	1.6	20.2	
Progression Factor	1.00	1.00	1.15	2.65	1.00	
Incremental Delay, d2	2.2	5.8	3.7	0.4	2.9	
Delay (s)	64.0	46.8	39.3	4.7	23.1	
Level of Service	E	D	D	A	C	
Approach Delay (s)	47.6			12.1	23.1	
Approach LOS	D			B	C	

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

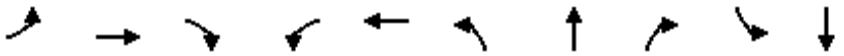
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	340	402	1488	1285	17
Future Volume (veh/h)	18	340	402	1488	1285	17
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	1573	1695	1736	1736	1709	1654
Adj Flow Rate, veh/h	20	370	437	1617	1397	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	13	4	1	1	3	7
Cap, veh/h	314	634	449	2341	1455	19
Arrive On Green	0.21	0.21	0.46	1.00	0.44	0.44
Sat Flow, veh/h	1498	1437	1654	3386	3368	42
Grp Volume(v), veh/h	20	370	437	1617	691	724
Grp Sat Flow(s),veh/h/ln	1498	1437	1654	1650	1624	1701
Q Serve(g_s), s	1.4	25.2	28.1	0.0	53.6	53.7
Cycle Q Clear(g_c), s	1.4	25.2	28.1	0.0	53.6	53.7
Prop In Lane	1.00	1.00	1.00			0.02
Lane Grp Cap(c), veh/h	314	634	449	2341	720	754
V/C Ratio(X)	0.06	0.58	0.97	0.69	0.96	0.96
Avail Cap(c_a), veh/h	324	644	467	2341	720	754
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.24	0.24	1.00	1.00
Uniform Delay (d), s/veh	41.2	27.3	26.1	0.0	35.1	35.1
Incr Delay (d2), s/veh	0.0	0.9	14.1	0.4	25.0	24.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	8.8	11.7	0.1	25.7	26.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	41.2	28.2	40.1	0.4	60.1	59.5
LnGrp LOS	D	C	D	A	E	E
Approach Vol, veh/h	390			2054	1415	
Approach Delay, s/veh	28.8			8.9	59.8	
Approach LOS	C			A	E	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	34.6	63.6				98.2	31.8
Change Period (Y+Rc), s	4.5	6.0				6.0	4.5
Max Green Setting (Gmax), s	31.5	55.4				91.4	28.1
Max Q Clear Time (g_c+I1), s	30.1	55.7				2.0	27.2
Green Ext Time (p_c), s	0.1	0.0				4.1	0.1

Intersection Summary			
HCM 6th Ctrl Delay		29.6	
HCM 6th LOS		C	



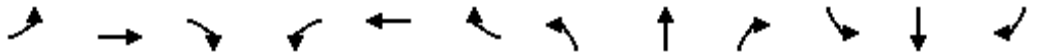
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	60	129	325	265	291	402	1756	245	46	1534
v/c Ratio	0.65	0.55	0.39	0.81	0.85	0.76	0.94	0.28	0.59	1.09
Control Delay	89.9	60.1	22.6	74.9	68.5	61.8	39.5	9.3	83.0	80.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.9	60.1	22.6	74.9	68.5	61.8	39.5	9.3	83.0	80.4
Queue Length 50th (ft)	50	102	75	113	228	166	746	47	39	~776
Queue Length 95th (ft)	97	158	119	157	311	#303	#1046	114	m53	#958
Internal Link Dist (ft)		939			288		444			1080
Turn Bay Length (ft)	150		300	75		300		200	170	
Base Capacity (vph)	127	350	897	421	446	532	1863	882	80	1403
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.37	0.36	0.63	0.65	0.76	0.94	0.28	0.57	1.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

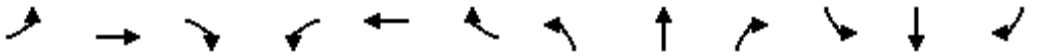
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	125	315	257	199	83	390	1703	238	45	1461	27
Future Volume (vph)	58	125	315	257	199	83	390	1703	238	45	1461	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	5.0	4.5		4.5	5.5	5.5	4.5	6.0	
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1630	1750	2507	3043	1646		3162	3260	1446	1583	3220	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1630	1750	2507	3043	1646		3162	3260	1446	1583	3220	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	60	129	325	265	205	86	402	1756	245	46	1506	28
RTOR Reduction (vph)	0	0	73	0	13	0	0	0	58	0	1	0
Lane Group Flow (vph)	60	129	252	265	278	0	402	1756	188	46	1533	0
Confl. Peds. (#/hr)	4		4	4		4	3		2	2		3
Confl. Bikes (#/hr)						3			2			
Heavy Vehicles (%)	2%	0%	3%	6%	1%	1%	2%	2%	0%	5%	3%	0%
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	6.7	18.3	40.2	14.1	26.2		21.9	72.5	72.5	5.6	55.7	
Effective Green, g (s)	6.7	18.3	40.2	14.1	26.2		21.9	72.5	72.5	5.6	55.7	
Actuated g/C Ratio	0.05	0.14	0.31	0.11	0.20		0.17	0.56	0.56	0.04	0.43	
Clearance Time (s)	4.5	4.5	4.5	5.0	4.5		4.5	5.5	5.5	4.5	6.0	
Vehicle Extension (s)	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lane Grp Cap (vph)	84	246	862	330	331		532	1818	806	68	1379	
v/s Ratio Prot	0.04	0.07	0.05	c0.09	c0.17		c0.13	c0.54		0.03	c0.48	
v/s Ratio Perm			0.05						0.13			
v/c Ratio	0.71	0.52	0.29	0.80	0.84		0.76	0.97	0.23	0.68	1.11	
Uniform Delay, d1	60.7	51.8	34.1	56.6	49.9		51.5	27.6	14.6	61.3	37.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.06	0.82	
Incremental Delay, d2	21.2	0.9	0.1	12.5	16.6		5.4	14.4	0.7	12.5	57.4	
Delay (s)	81.9	52.7	34.2	69.1	66.5		56.9	42.0	15.3	77.8	87.9	
Level of Service	F	D	C	E	E		E	D	B	E	F	
Approach Delay (s)		44.4			67.7			41.8			87.6	
Approach LOS		D			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	59.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
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)	58	125	315	257	199	83	390	1703	238	45	1461	27
Future Volume (veh/h)	58	125	315	257	199	83	390	1703	238	45	1461	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	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	1723	1750	1709	1668	1736	1736	1723	1723	1750	1682	1709	1750
Adj Flow Rate, veh/h	60	129	325	265	205	86	402	1756	0	46	1506	28
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	0	3	6	1	1	2	2	0	5	3	0
Cap, veh/h	75	242	636	309	227	95	360	1871		57	1611	30
Arrive On Green	0.05	0.14	0.14	0.10	0.20	0.20	0.11	0.57	0.00	0.05	0.66	0.66
Sat Flow, veh/h	1641	1750	2512	3082	1153	484	3183	3273	1483	1602	3261	61
Grp Volume(v), veh/h	60	129	325	265	0	291	402	1756	0	46	749	785
Grp Sat Flow(s),veh/h/ln	1641	1750	1256	1541	0	1637	1591	1637	1483	1602	1624	1698
Q Serve(g_s), s	4.7	8.9	14.5	11.0	0.0	22.6	14.7	64.4	0.0	3.7	53.2	53.5
Cycle Q Clear(g_c), s	4.7	8.9	14.5	11.0	0.0	22.6	14.7	64.4	0.0	3.7	53.2	53.5
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	75	242	636	309	0	323	360	1871		57	802	839
V/C Ratio(X)	0.80	0.53	0.51	0.86	0.00	0.90	1.12	0.94		0.81	0.93	0.94
Avail Cap(c_a), veh/h	129	350	791	427	0	432	360	1871		62	802	839
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	0.57	0.57	0.57
Uniform Delay (d), s/veh	61.4	52.1	41.8	57.5	0.0	51.0	57.6	25.7	0.0	61.5	20.4	20.4
Incr Delay (d2), s/veh	7.1	0.7	0.2	9.2	0.0	15.3	82.9	10.6	0.0	30.2	12.6	12.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	4.0	4.5	4.7	0.0	10.6	10.1	26.6	0.0	2.0	19.4	20.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.6	52.8	42.1	66.7	0.0	66.3	140.6	36.3	0.0	91.7	33.0	32.9
LnGrp LOS	E	D	D	E	A	E	F	D		F	C	C
Approach Vol, veh/h		514			556			2158	A		1580	
Approach Delay, s/veh		47.8			66.5			55.7			34.6	
Approach LOS		D			E			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.2	70.2	10.4	30.1	9.1	80.3	18.1	22.5
Change Period (Y+Rc), s	4.5	6.0	4.5	4.5	4.5	* 6	5.0	4.5
Max Green Setting (Gmax), s	14.7	51.3	10.2	34.3	5.0	* 62	18.0	26.0
Max Q Clear Time (g_c+I1), s	16.7	55.5	6.7	24.6	5.7	66.4	13.0	16.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.3	0.0	0.0	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	49.2
HCM 6th LOS	D

Notes

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

User approved changes to right turn type.

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

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	83	26	214	276	4
Future Vol, veh/h	14	83	26	214	276	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	6	2	0
Mvmt Flow	16	95	30	246	317	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	626	320	322	0	-	0
Stage 1	320	-	-	-	-	-
Stage 2	306	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	451	725	1249	-	-	-
Stage 1	741	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	438	725	1249	-	-	-
Mov Cap-2 Maneuver	438	-	-	-	-	-
Stage 1	720	-	-	-	-	-
Stage 2	751	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1249	-	662	-	-
HCM Lane V/C Ratio	0.024	-	0.168	-	-
HCM Control Delay (s)	8	0	11.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

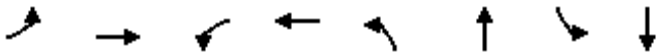
Intersection	
Int Delay, s/veh	17.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	185	124	205	112	19	8	3	165	37	6	11
Future Vol, veh/h	4	185	124	205	112	19	8	3	165	37	6	11
Conflicting Peds, #/hr	0	0	13	13	0	0	7	0	0	0	0	7
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	110	-	-	225	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	66	66	66	66	66	66	66	66	66	66	66	66
Heavy Vehicles, %	0	9	0	11	0	100	0	0	0	0	0	0
Mvmt Flow	6	280	188	311	170	29	12	5	250	56	9	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	199	0	0	481	0	0	1226	1220	387	1321	1300	192
Stage 1	-	-	-	-	-	-	399	399	-	807	807	-
Stage 2	-	-	-	-	-	-	827	821	-	514	493	-
Critical Hdwy	4.1	-	-	4.21	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.299	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1385	-	-	1036	-	-	157	182	665	135	163	855
Stage 1	-	-	-	-	-	-	631	606	-	378	397	-
Stage 2	-	-	-	-	-	-	369	391	-	547	550	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1385	-	-	1023	-	-	108	125	657	62	112	849
Mov Cap-2 Maneuver	-	-	-	-	-	-	108	125	-	62	112	-
Stage 1	-	-	-	-	-	-	620	596	-	376	276	-
Stage 2	-	-	-	-	-	-	242	272	-	335	541	-

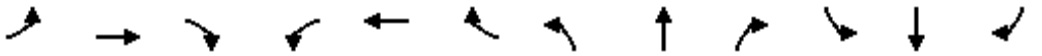
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	6.1	15.6	193.9
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	112	657	1385	-	-	1023	-	-	81
HCM Lane V/C Ratio	0.149	0.381	0.004	-	-	0.304	-	-	1.01
HCM Control Delay (s)	42.7	13.8	7.6	-	-	10	-	-	193.9
HCM Lane LOS	E	B	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	0.5	1.8	0	-	-	1.3	-	-	5.6



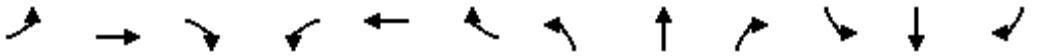
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	69	322	334	305	32	356	92	321
v/c Ratio	0.21	0.82	0.66	0.43	0.12	0.85	0.42	0.64
Control Delay	13.6	45.9	18.3	18.9	19.2	42.4	24.9	31.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	45.9	18.3	18.9	19.2	42.4	24.9	31.6
Queue Length 50th (ft)	15	139	87	96	9	127	28	113
Queue Length 95th (ft)	40	261	170	188	31	259	71	264
Internal Link Dist (ft)		872		1419		1586		230
Turn Bay Length (ft)	190		200		200		110	
Base Capacity (vph)	383	742	628	1061	293	710	236	736
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.43	0.53	0.29	0.11	0.50	0.39	0.44

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	231	49	291	208	57	28	122	188	80	241	38
Future Volume (vph)	60	231	49	291	208	57	28	122	188	80	241	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	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	0.99		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	0.91		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1536	1616		1655	1665		1562	1562		1526	1700	
Flt Permitted	0.57	1.00		0.29	1.00		0.44	1.00		0.25	1.00	
Satd. Flow (perm)	929	1616		501	1665		722	1562		407	1700	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	69	266	56	334	239	66	32	140	216	92	277	44
RTOR Reduction (vph)	0	8	0	0	10	0	0	57	0	0	6	0
Lane Group Flow (vph)	69	314	0	334	295	0	32	299	0	92	315	0
Confl. Peds. (#/hr)	5		16	16		5	10		5	5		10
Confl. Bikes (#/hr)						1						1
Heavy Vehicles (%)	11%	6%	15%	3%	5%	0%	9%	6%	1%	12%	1%	17%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	22.5	18.9		38.3	30.7		20.3	18.7		25.3	21.2	
Effective Green, g (s)	22.5	18.9		38.3	30.7		20.3	18.7		25.3	21.2	
Actuated g/C Ratio	0.30	0.25		0.51	0.41		0.27	0.25		0.34	0.28	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	0.5	0.5		0.5	0.5		0.5	0.5		0.5	0.5	
Lane Grp Cap (vph)	307	406		492	680		213	388		198	479	
v/s Ratio Prot	0.01	c0.19		c0.14	0.18		0.00	c0.19		c0.03	0.19	
v/s Ratio Perm	0.06			0.21			0.04			0.13		
v/c Ratio	0.22	0.77		0.68	0.43		0.15	0.77		0.46	0.66	
Uniform Delay, d1	19.3	26.1		12.6	16.0		20.5	26.2		18.5	23.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	8.1		2.9	0.2		0.1	8.4		0.6	2.5	
Delay (s)	19.4	34.2		15.5	16.1		20.7	34.6		19.2	26.2	
Level of Service	B	C		B	B		C	C		B	C	
Approach Delay (s)		31.6			15.8			33.4			24.7	
Approach LOS		C			B			C			C	

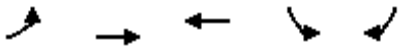
Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	75.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	231	49	291	208	57	28	122	188	80	241	38
Future Volume (veh/h)	60	231	49	291	208	57	28	122	188	80	241	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.97	0.99		0.96	0.99		0.98	0.99		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	1646	1716	1589	1758	1730	1800	1674	1716	1786	1632	1786	1561
Adj Flow Rate, veh/h	69	266	56	334	239	66	32	140	216	92	277	44
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	11	6	15	3	5	0	9	6	1	12	1	17
Cap, veh/h	382	334	70	447	475	131	276	161	249	236	459	73
Arrive On Green	0.05	0.24	0.24	0.17	0.37	0.37	0.02	0.27	0.27	0.06	0.31	0.31
Sat Flow, veh/h	1567	1365	287	1674	1291	356	1594	601	927	1554	1495	237
Grp Volume(v), veh/h	69	0	322	334	0	305	32	0	356	92	0	321
Grp Sat Flow(s),veh/h/ln	1567	0	1653	1674	0	1647	1594	0	1528	1554	0	1732
Q Serve(g_s), s	2.3	0.0	12.7	9.6	0.0	10.0	1.0	0.0	15.4	2.9	0.0	10.9
Cycle Q Clear(g_c), s	2.3	0.0	12.7	9.6	0.0	10.0	1.0	0.0	15.4	2.9	0.0	10.9
Prop In Lane	1.00		0.17	1.00		0.22	1.00		0.61	1.00		0.14
Lane Grp Cap(c), veh/h	382	0	404	447	0	606	276	0	410	236	0	532
V/C Ratio(X)	0.18	0.00	0.80	0.75	0.00	0.50	0.12	0.00	0.87	0.39	0.00	0.60
Avail Cap(c_a), veh/h	452	0	691	648	0	1017	373	0	600	275	0	685
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.3	0.0	24.6	15.7	0.0	17.0	18.4	0.0	24.2	18.3	0.0	20.4
Incr Delay (d2), s/veh	0.1	0.0	1.4	1.3	0.0	0.2	0.1	0.0	6.5	0.4	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	4.8	3.4	0.0	3.5	0.4	0.0	5.9	1.0	0.0	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.4	0.0	25.9	17.0	0.0	17.2	18.5	0.0	30.7	18.7	0.0	20.8
LnGrp LOS	B	A	C	B	A	B	B	A	C	B	A	C
Approach Vol, veh/h		391			639			388			413	
Approach Delay, s/veh		24.6			17.1			29.7			20.4	
Approach LOS		C			B			C			C	

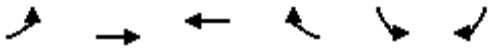
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.4	26.3	7.1	30.5	8.1	23.6	15.7	22.0
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	5.6	27.4	6.2	42.8	5.8	27.2	20.0	29.0
Max Q Clear Time (g_c+I1), s	3.0	12.9	4.3	12.0	4.9	17.4	11.6	14.7
Green Ext Time (p_c), s	0.0	0.4	0.0	0.5	0.0	0.5	0.1	0.4

Intersection Summary	
HCM 6th Ctrl Delay	22.1
HCM 6th LOS	C



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	327	254	406	368	298
v/c Ratio	0.63	0.25	0.80	0.78	0.47
Control Delay	14.1	8.4	29.0	34.0	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	8.4	29.0	34.0	5.5
Queue Length 50th (ft)	56	43	102	122	0
Queue Length 95th (ft)	140	103	243	255	52
Internal Link Dist (ft)		571	431	1342	
Turn Bay Length (ft)	75				150
Base Capacity (vph)	589	1378	784	1288	1224
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.56	0.18	0.52	0.29	0.24

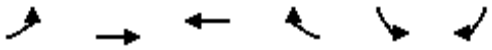
Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	301	234	123	250	339	274
Future Volume (vph)	301	234	123	250	339	274
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	5.0	5.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.91		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1692	1782	1537		1693	1515
Flt Permitted	0.25	1.00	1.00		0.95	1.00
Satd. Flow (perm)	445	1782	1537		1693	1515
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	327	254	134	272	368	298
RTOR Reduction (vph)	0	0	71	0	0	214
Lane Group Flow (vph)	327	254	335	0	368	84
Confl. Peds. (#/hr)	4			4		
Heavy Vehicles (%)	1%	1%	8%	3%	1%	1%
Turn Type	pm+pt	NA	NA		pm+pt	Perm
Protected Phases	3	8	4		2	
Permitted Phases	8				6	2 6
Actuated Green, G (s)	34.2	34.2	17.7		16.9	16.9
Effective Green, g (s)	34.2	34.2	17.7		16.9	16.9
Actuated g/C Ratio	0.57	0.57	0.29		0.28	0.28
Clearance Time (s)	4.0	5.0	5.0		4.0	
Vehicle Extension (s)	0.5	0.5	0.5		0.5	
Lane Grp Cap (vph)	512	1014	452		476	426
v/s Ratio Prot	c0.13	0.14	c0.22		c0.22	
v/s Ratio Perm	0.23					0.06
v/c Ratio	0.64	0.25	0.74		0.77	0.20
Uniform Delay, d1	8.6	6.5	19.1		19.8	16.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.9	0.0	5.7		7.0	0.1
Delay (s)	10.5	6.6	24.8		26.8	16.5
Level of Service	B	A	C		C	B
Approach Delay (s)		8.8	24.8		22.2	
Approach LOS		A	C		C	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	60.1	Sum of lost time (s)	13.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	301	234	123	250	339	274
Future Volume (veh/h)	301	234	123	250	339	274
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.99	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	1786	1786	1688	1758	1786	1786
Adj Flow Rate, veh/h	327	254	134	272	368	298
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	8	3	1	1
Cap, veh/h	477	995	156	317	429	381
Arrive On Green	0.16	0.56	0.32	0.32	0.25	0.25
Sat Flow, veh/h	1701	1786	495	1004	1701	1514
Grp Volume(v), veh/h	327	254	0	406	368	298
Grp Sat Flow(s),veh/h/ln	1701	1786	0	1499	1701	1514
Q Serve(g_s), s	5.5	3.5	0.0	12.0	9.8	8.7
Cycle Q Clear(g_c), s	5.5	3.5	0.0	12.0	9.8	8.7
Prop In Lane	1.00			0.67	1.00	1.00
Lane Grp Cap(c), veh/h	477	995	0	473	429	381
V/C Ratio(X)	0.69	0.26	0.00	0.86	0.86	0.78
Avail Cap(c_a), veh/h	750	1740	0	857	1621	1442
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.6	5.4	0.0	15.2	16.9	16.4
Incr Delay (d2), s/veh	0.7	0.0	0.0	1.8	2.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.9	0.0	3.6	3.5	2.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.3	5.4	0.0	16.9	18.8	17.8
LnGrp LOS	B	A	A	B	B	B
Approach Vol, veh/h		581	406		666	
Approach Delay, s/veh		8.2	16.9		18.4	
Approach LOS		A	B		B	

Timer - Assigned Phs	2	3	4			8
Phs Duration (G+Y+Rc), s	15.9	11.4	19.9			31.3
Change Period (Y+Rc), s	4.0	4.0	5.0			5.0
Max Green Setting (Gmax), s	45.0	15.0	27.0			46.0
Max Q Clear Time (g_c+I1), s	11.8	7.5	14.0			5.5
Green Ext Time (p_c), s	0.2	0.1	0.6			0.3

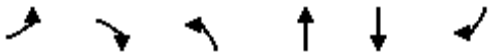
Intersection Summary	
HCM 6th Ctrl Delay	14.4
HCM 6th LOS	B

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	17	530	307	977	1317
v/c Ratio	0.25	0.95	0.48	0.33	0.74
Control Delay	68.6	65.6	23.4	2.7	27.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	68.6	65.6	23.4	2.7	27.7
Queue Length 50th (ft)	14	~474	178	0	391
Queue Length 95th (ft)	40	501	322	211	#656
Internal Link Dist (ft)	1063			1080	560
Turn Bay Length (ft)	125		115		
Base Capacity (vph)	317	555	646	2995	1776
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.05	0.95	0.48	0.33	0.74

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

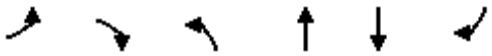
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	16	488	282	899	1201	11
Future Volume (vph)	16	488	282	899	1201	11
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	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)	1471	1458	1614	3167	3244	
Flt Permitted	0.95	1.00	0.10	1.00	1.00	
Satd. Flow (perm)	1471	1458	174	3167	3244	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	530	307	977	1305	12
RTOR Reduction (vph)	0	13	0	0	0	0
Lane Group Flow (vph)	17	517	307	977	1317	0
Confl. Peds. (#/hr)	2					
Heavy Vehicles (%)	13%	2%	3%	5%	2%	40%
Turn Type	Prot	pm+ov	pm+pt	NA	NA	
Protected Phases	8	1	1	6	2	
Permitted Phases		8	6			
Actuated Green, G (s)	2.9	46.6	116.6	116.6	68.4	
Effective Green, g (s)	2.9	46.6	116.6	116.6	68.4	
Actuated g/C Ratio	0.02	0.36	0.90	0.90	0.53	
Clearance Time (s)	4.5	4.5	4.5	6.0	6.0	
Vehicle Extension (s)	1.5	1.0	1.0	0.5	0.5	
Lane Grp Cap (vph)	32	573	640	2840	1706	
v/s Ratio Prot	0.01	c0.30	0.16	0.31	c0.41	
v/s Ratio Perm		0.05	0.27			
v/c Ratio	0.53	0.90	0.48	0.34	0.77	
Uniform Delay, d1	62.9	39.5	20.5	1.0	24.6	
Progression Factor	1.00	1.00	1.54	2.89	1.00	
Incremental Delay, d2	8.2	17.0	0.2	0.2	3.5	
Delay (s)	71.1	56.5	31.7	3.1	28.0	
Level of Service	E	E	C	A	C	
Approach Delay (s)	57.0			10.0	28.0	
Approach LOS	E			A	C	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

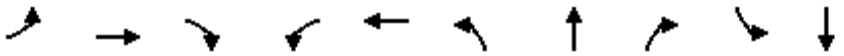
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	488	282	899	1201	11
Future Volume (veh/h)	16	488	282	899	1201	11
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	1573	1723	1709	1682	1723	1204
Adj Flow Rate, veh/h	17	530	307	977	1305	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	13	2	3	5	2	40
Cap, veh/h	324	463	330	2247	1885	17
Arrive On Green	0.22	0.22	0.20	1.00	0.57	0.57
Sat Flow, veh/h	1498	1460	1628	3279	3409	31
Grp Volume(v), veh/h	17	530	307	977	643	674
Grp Sat Flow(s),veh/h/ln	1498	1460	1628	1598	1637	1717
Q Serve(g_s), s	1.2	28.1	11.0	0.0	36.4	36.4
Cycle Q Clear(g_c), s	1.2	28.1	11.0	0.0	36.4	36.4
Prop In Lane	1.00	1.00	1.00			0.02
Lane Grp Cap(c), veh/h	324	463	330	2247	928	974
V/C Ratio(X)	0.05	1.14	0.93	0.43	0.69	0.69
Avail Cap(c_a), veh/h	324	463	524	2247	928	974
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.66	0.66	1.00	1.00
Uniform Delay (d), s/veh	40.4	44.4	20.2	0.0	20.0	20.1
Incr Delay (d2), s/veh	0.0	87.5	9.0	0.4	4.2	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	26.0	5.8	0.1	14.6	15.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	40.4	131.8	29.2	0.4	24.3	24.1
LnGrp LOS	D	F	C	A	C	C
Approach Vol, veh/h	547			1284	1317	
Approach Delay, s/veh	129.0			7.3	24.2	
Approach LOS	F			A	C	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	17.7	79.7				97.4	32.6
Change Period (Y+Rc), s	4.5	6.0				6.0	4.5
Max Green Setting (Gmax), s	28.7	58.2				91.4	28.1
Max Q Clear Time (g_c+I1), s	13.0	38.4				2.0	30.1
Green Ext Time (p_c), s	0.1	2.1				2.0	0.0

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



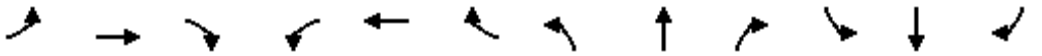
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	65	119	685	169	73	167	1187	89	17	1670
v/c Ratio	0.66	0.29	0.82	0.72	0.17	0.83	0.69	0.10	0.34	1.10
Control Delay	88.4	42.7	42.0	74.9	32.0	90.3	26.1	1.2	76.9	81.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.4	42.7	42.0	74.9	32.0	90.3	26.1	1.2	76.9	81.2
Queue Length 50th (ft)	55	80	242	72	39	~77	367	0	14	~865
Queue Length 95th (ft)	103	141	#360	109	82	#153	529	11	m18	m#967
Internal Link Dist (ft)		939			288		444			1080
Turn Bay Length (ft)	150		300	75		300		200	170	
Base Capacity (vph)	141	410	833	417	426	202	1716	858	60	1524
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.29	0.82	0.41	0.17	0.83	0.69	0.10	0.28	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

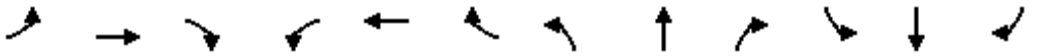
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	111	637	157	51	17	155	1104	83	16	1541	12
Future Volume (vph)	60	111	637	157	51	17	155	1104	83	16	1541	12
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	5.0	4.5		4.5	5.5	5.5	4.5	6.0	
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.99		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1662	1750	2541	3014	1549		3162	3167	1473	1554	3249	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1662	1750	2541	3014	1549		3162	3167	1473	1554	3249	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	65	119	685	169	55	18	167	1187	89	17	1657	13
RTOR Reduction (vph)	0	0	73	0	9	0	0	0	43	0	1	0
Lane Group Flow (vph)	65	119	612	169	64	0	167	1187	46	17	1669	0
Confl. Peds. (#/hr)	7		2	2		7	7					7
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	0%	0%	1%	7%	7%	12%	2%	5%	1%	7%	2%	27%
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	7.0	31.4	39.8	10.2	35.1		8.4	66.9	66.9	2.0	60.0	
Effective Green, g (s)	7.0	31.4	39.8	10.2	35.1		8.4	66.9	66.9	2.0	60.0	
Actuated g/C Ratio	0.05	0.24	0.31	0.08	0.27		0.06	0.51	0.51	0.02	0.46	
Clearance Time (s)	4.5	4.5	4.5	5.0	4.5		4.5	5.5	5.5	4.5	6.0	
Vehicle Extension (s)	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lane Grp Cap (vph)	89	422	865	236	418		204	1629	758	23	1499	
v/s Ratio Prot	0.04	0.07	c0.05	c0.06	c0.04		c0.05	0.37		0.01	c0.51	
v/s Ratio Perm			0.20						0.03			
v/c Ratio	0.73	0.28	0.71	0.72	0.15		0.82	0.73	0.06	0.74	1.11	
Uniform Delay, d1	60.6	40.1	39.9	58.5	36.1		60.0	24.5	15.8	63.7	35.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.08	0.92	
Incremental Delay, d2	23.0	0.1	2.2	8.3	0.1		20.9	2.9	0.2	45.5	57.2	
Delay (s)	83.6	40.3	42.1	66.8	36.2		80.9	27.4	16.0	114.5	89.2	
Level of Service	F	D	D	E	D		F	C	B	F	F	
Approach Delay (s)		45.0			57.6			32.9			89.5	
Approach LOS		D			E			C			F	

Intersection Summary			
HCM 2000 Control Delay	59.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	88.9%	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)	60	111	637	157	51	17	155	1104	83	16	1541	12
Future Volume (veh/h)	60	111	637	157	51	17	155	1104	83	16	1541	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1736	1654	1654	1586	1723	1682	1736	1654	1723	1381
Adj Flow Rate, veh/h	65	119	685	169	55	18	167	1187	0	17	1657	13
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	1	7	7	12	2	5	1	7	2	27
Cap, veh/h	81	350	642	214	268	88	164	1803		19	1746	14
Arrive On Green	0.05	0.20	0.20	0.07	0.22	0.22	0.05	0.56	0.00	0.02	0.70	0.70
Sat Flow, veh/h	1667	1750	2544	3057	1190	390	3183	3195	1471	1576	3328	26
Grp Volume(v), veh/h	65	119	685	169	0	73	167	1187	0	17	814	856
Grp Sat Flow(s),veh/h/ln	1667	1750	1272	1528	0	1580	1591	1598	1471	1576	1637	1717
Q Serve(g_s), s	5.0	7.6	26.0	7.1	0.0	4.9	6.7	33.5	0.0	1.4	57.8	58.0
Cycle Q Clear(g_c), s	5.0	7.6	26.0	7.1	0.0	4.9	6.7	33.5	0.0	1.4	57.8	58.0
Prop In Lane	1.00		1.00	1.00		0.25	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	81	350	642	214	0	355	164	1803		19	859	901
V/C Ratio(X)	0.80	0.34	1.07	0.79	0.00	0.21	1.02	0.66		0.90	0.95	0.95
Avail Cap(c_a), veh/h	142	350	642	423	0	406	164	1803		62	859	901
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	0.49	0.49	0.49
Uniform Delay (d), s/veh	61.2	44.6	48.7	59.5	0.0	40.9	61.6	19.6	0.0	63.9	18.1	18.1
Incr Delay (d2), s/veh	6.5	0.2	54.5	2.5	0.0	0.1	75.1	1.9	0.0	22.3	12.3	12.1
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	2.3	3.3	15.2	2.8	0.0	1.9	4.4	12.6	0.0	0.7	19.9	21.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.7	44.8	103.2	62.0	0.0	41.0	136.7	21.5	0.0	86.2	30.4	30.2
LnGrp LOS	E	D	F	E	A	D	F	C		F	C	C
Approach Vol, veh/h		869			242			1354	A		1687	
Approach Delay, s/veh		92.6			55.7			35.7			30.8	
Approach LOS		F			E			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	74.2	10.9	33.7	6.1	79.3	14.1	30.5
Change Period (Y+Rc), s	4.5	6.0	4.5	4.5	4.5	* 6	5.0	4.5
Max Green Setting (Gmax), s	6.7	59.3	11.1	33.4	5.1	* 61	18.0	26.0
Max Q Clear Time (g_c+I1), s	8.7	60.0	7.0	6.9	3.4	35.5	9.1	28.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.1	0.0	2.6	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	46.8
HCM 6th LOS	D

Notes

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

User approved changes to right turn type.

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

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	50	86	220	270	16
Future Vol, veh/h	9	50	86	220	270	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	10	57	99	253	310	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	770	319	328	0	-	0
Stage 1	319	-	-	-	-	-
Stage 2	451	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	372	726	1243	-	-	-
Stage 1	741	-	-	-	-	-
Stage 2	646	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	337	726	1243	-	-	-
Mov Cap-2 Maneuver	337	-	-	-	-	-
Stage 1	672	-	-	-	-	-
Stage 2	646	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	2.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1243	-	617	-	-
HCM Lane V/C Ratio	0.08	-	0.11	-	-
HCM Control Delay (s)	8.1	0	11.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.4	-	-

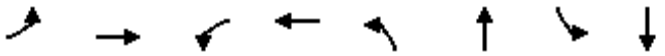
Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	181	19	76	165	44	23	5	127	34	1	7
Future Vol, veh/h	7	181	19	76	165	44	23	5	127	34	1	7
Conflicting Peds, #/hr	0	0	37	37	0	0	12	0	0	0	0	12
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	110	-	-	225	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	58	58	58	58	58	58	58	58	58	58	58	58
Heavy Vehicles, %	0	9	0	3	7	0	0	0	0	0	0	0
Mvmt Flow	12	312	33	131	284	76	40	9	219	59	2	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	360	0	0	382	0	0	993	1012	366	1051	990	334
Stage 1	-	-	-	-	-	-	390	390	-	584	584	-
Stage 2	-	-	-	-	-	-	603	622	-	467	406	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1210	-	-	1171	-	-	226	241	684	207	248	712
Stage 1	-	-	-	-	-	-	638	611	-	501	501	-
Stage 2	-	-	-	-	-	-	489	482	-	580	601	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1210	-	-	1130	-	-	191	204	660	121	210	704
Mov Cap-2 Maneuver	-	-	-	-	-	-	191	204	-	121	210	-
Stage 1	-	-	-	-	-	-	609	584	-	496	443	-
Stage 2	-	-	-	-	-	-	418	426	-	378	574	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	2.3	16.1	54.2
HCM LOS			C	F

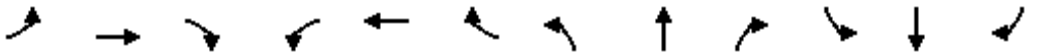
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	193	660	1210	-	-	1130	-	-	142
HCM Lane V/C Ratio	0.25	0.332	0.01	-	-	0.116	-	-	0.51
HCM Control Delay (s)	29.8	13.1	8	-	-	8.6	-	-	54.2
HCM Lane LOS	D	B	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	1	1.5	0	-	-	0.4	-	-	2.4



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	50	319	211	307	47	405	109	255
v/c Ratio	0.14	0.80	0.50	0.46	0.12	0.83	0.43	0.46
Control Delay	15.0	43.7	18.4	21.2	14.9	37.1	19.8	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	43.7	18.4	21.2	14.9	37.1	19.8	23.8
Queue Length 50th (ft)	12	130	57	99	12	147	30	92
Queue Length 95th (ft)	38	#309	129	218	34	274	68	178
Internal Link Dist (ft)		896		1419		1586		230
Turn Bay Length (ft)	190		200		200		110	
Base Capacity (vph)	423	590	515	827	443	922	279	977
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.54	0.41	0.37	0.11	0.44	0.39	0.26

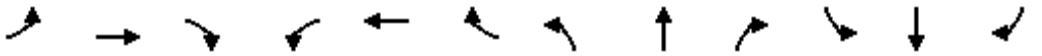
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	203	77	186	165	105	41	157	200	96	197	27
Future Volume (vph)	44	203	77	186	165	105	41	157	200	96	197	27
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	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	0.95		1.00	0.98		1.00	0.98		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		0.98	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.94		1.00	0.92		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1585	1576		1640	1627		1710	1596		1611	1739	
Flt Permitted	0.57	1.00		0.32	1.00		0.57	1.00		0.23	1.00	
Satd. Flow (perm)	957	1576		547	1627		1023	1596		382	1739	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	50	231	88	211	188	119	47	178	227	109	224	31
RTOR Reduction (vph)	0	13	0	0	21	0	0	52	0	0	6	0
Lane Group Flow (vph)	50	306	0	211	286	0	47	353	0	109	249	0
Confl. Peds. (#/hr)	13		95	95		13			12	12		
Confl. Bikes (#/hr)						2						1
Heavy Vehicles (%)	7%	3%	7%	2%	4%	0%	0%	1%	1%	6%	1%	4%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	22.9	20.3		35.2	28.6		23.1	20.6		27.9	23.0	
Effective Green, g (s)	22.9	20.3		35.2	28.6		23.1	20.6		27.9	23.0	
Actuated g/C Ratio	0.31	0.27		0.47	0.38		0.31	0.28		0.37	0.31	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	0.5	0.5		0.5	0.5		0.5	0.5		0.5	0.5	
Lane Grp Cap (vph)	315	428		417	622		339	440		223	535	
v/s Ratio Prot	0.01	c0.19		c0.07	0.18		0.00	c0.22		c0.03	0.14	
v/s Ratio Perm	0.04			0.16			0.04			0.15		
v/c Ratio	0.16	0.71		0.51	0.46		0.14	0.80		0.49	0.47	
Uniform Delay, d1	18.5	24.6		13.0	17.3		18.3	25.2		17.0	20.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	4.7		0.4	0.2		0.1	9.6		0.6	0.2	
Delay (s)	18.6	29.3		13.3	17.5		18.4	34.7		17.7	21.1	
Level of Service	B	C		B	B		B	C		B	C	
Approach Delay (s)		27.8			15.8			33.0			20.1	
Approach LOS		C			B			C			C	

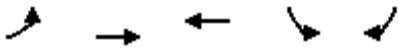
Intersection Summary			
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	74.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	203	77	186	165	105	41	157	200	96	197	27
Future Volume (veh/h)	44	203	77	186	165	105	41	157	200	96	197	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.91		0.84	0.94		0.85	0.99		0.98	0.99		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	1702	1758	1702	1772	1744	1800	1800	1786	1786	1716	1786	1744
Adj Flow Rate, veh/h	50	231	88	211	188	119	47	178	227	109	224	31
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	7	3	7	2	4	0	0	1	1	6	1	4
Cap, veh/h	336	334	127	390	343	217	368	200	255	245	490	68
Arrive On Green	0.03	0.29	0.29	0.11	0.37	0.37	0.03	0.28	0.28	0.07	0.32	0.32
Sat Flow, veh/h	1621	1144	436	1688	929	588	1714	704	898	1634	1526	211
Grp Volume(v), veh/h	50	0	319	211	0	307	47	0	405	109	0	255
Grp Sat Flow(s),veh/h/ln	1621	0	1580	1688	0	1518	1714	0	1602	1634	0	1738
Q Serve(g_s), s	1.6	0.0	12.9	5.9	0.0	11.5	1.4	0.0	17.4	3.3	0.0	8.4
Cycle Q Clear(g_c), s	1.6	0.0	12.9	5.9	0.0	11.5	1.4	0.0	17.4	3.3	0.0	8.4
Prop In Lane	1.00		0.28	1.00		0.39	1.00		0.56	1.00		0.12
Lane Grp Cap(c), veh/h	336	0	461	390	0	560	368	0	456	245	0	558
V/C Ratio(X)	0.15	0.00	0.69	0.54	0.00	0.55	0.13	0.00	0.89	0.45	0.00	0.46
Avail Cap(c_a), veh/h	443	0	526	558	0	674	485	0	800	297	0	868
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.3	0.0	22.6	15.5	0.0	18.0	17.7	0.0	24.7	18.5	0.0	19.5
Incr Delay (d2), s/veh	0.1	0.0	2.4	0.4	0.0	0.3	0.1	0.0	2.7	0.5	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	4.8	2.1	0.0	3.8	0.5	0.0	6.5	1.2	0.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.4	0.0	25.0	15.9	0.0	18.3	17.8	0.0	27.4	18.9	0.0	19.7
LnGrp LOS	B	A	C	B	A	B	B	A	C	B	A	B
Approach Vol, veh/h		369			518			452			364	
Approach Delay, s/veh		24.0			17.3			26.4			19.5	
Approach LOS		C			B			C			B	

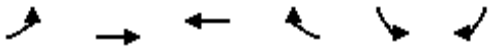
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.1	28.1	6.2	31.6	8.7	25.5	11.8	26.0
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	7.0	36.0	7.0	32.0	7.0	36.0	15.0	24.0
Max Q Clear Time (g_c+I1), s	3.4	10.4	3.6	13.5	5.3	19.4	7.9	14.9
Green Ext Time (p_c), s	0.0	0.3	0.0	0.5	0.0	0.6	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	21.6
HCM 6th LOS	C



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	210	265	460	384	296
v/c Ratio	0.51	0.28	0.78	0.79	0.47
Control Delay	12.3	9.1	27.0	33.4	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.3	9.1	27.0	33.4	6.0
Queue Length 50th (ft)	30	41	114	112	2
Queue Length 95th (ft)	93	120	315	299	60
Internal Link Dist (ft)		571	431	1342	
Turn Bay Length (ft)	75				150
Base Capacity (vph)	568	1599	1245	1025	1007
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.37	0.17	0.37	0.37	0.29

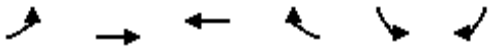
Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	191	241	234	185	349	269
Future Volume (vph)	191	241	234	185	349	269
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	5.0	5.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.94		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1710	1782	1635		1676	1468
Flt Permitted	0.26	1.00	1.00		0.95	1.00
Satd. Flow (perm)	469	1782	1635		1676	1468
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	210	265	257	203	384	296
RTOR Reduction (vph)	0	0	31	0	0	201
Lane Group Flow (vph)	210	265	429	0	384	95
Confl. Peds. (#/hr)	1			1	3	1
Heavy Vehicles (%)	0%	1%	3%	2%	2%	2%
Turn Type	pm+pt	NA	NA		pm+pt	Perm
Protected Phases	3	8	4		2	
Permitted Phases	8				6	2 6
Actuated Green, G (s)	31.7	31.7	20.7		17.2	17.2
Effective Green, g (s)	31.7	31.7	20.7		17.2	17.2
Actuated g/C Ratio	0.55	0.55	0.36		0.30	0.30
Clearance Time (s)	4.0	5.0	5.0		4.0	
Vehicle Extension (s)	0.5	0.5	0.5		0.5	
Lane Grp Cap (vph)	406	975	584		497	436
v/s Ratio Prot	c0.06	0.15	c0.26		c0.23	
v/s Ratio Perm	0.22					0.06
v/c Ratio	0.52	0.27	0.73		0.77	0.22
Uniform Delay, d1	8.3	7.0	16.2		18.6	15.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.5	0.1	4.1		6.7	0.1
Delay (s)	8.8	7.0	20.3		25.3	15.4
Level of Service	A	A	C		C	B
Approach Delay (s)		7.8	20.3		21.0	
Approach LOS		A	C		C	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	57.9	Sum of lost time (s)	13.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	191	241	234	185	349	269
Future Volume (veh/h)	191	241	234	185	349	269
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	1800	1786	1758	1772	1772	1772
Adj Flow Rate, veh/h	210	265	257	203	384	296
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	1	3	2	2	2
Cap, veh/h	409	946	299	236	448	399
Arrive On Green	0.11	0.53	0.33	0.33	0.27	0.27
Sat Flow, veh/h	1714	1786	909	718	1688	1502
Grp Volume(v), veh/h	210	265	0	460	384	296
Grp Sat Flow(s),veh/h/ln	1714	1786	0	1627	1688	1502
Q Serve(g_s), s	3.2	3.6	0.0	11.6	9.5	7.9
Cycle Q Clear(g_c), s	3.2	3.6	0.0	11.6	9.5	7.9
Prop In Lane	1.00			0.44	1.00	1.00
Lane Grp Cap(c), veh/h	409	946	0	535	448	399
V/C Ratio(X)	0.51	0.28	0.00	0.86	0.86	0.74
Avail Cap(c_a), veh/h	730	2402	0	1558	1231	1095
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.3	5.7	0.0	13.8	15.3	14.7
Incr Delay (d2), s/veh	0.4	0.1	0.0	1.6	1.9	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.9	0.0	3.6	3.3	2.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.7	5.8	0.0	15.4	17.2	15.8
LnGrp LOS	A	A	A	B	B	B
Approach Vol, veh/h		475	460		680	
Approach Delay, s/veh		7.5	15.4		16.6	
Approach LOS		A	B		B	

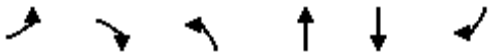
Timer - Assigned Phs	2	3	4			8
Phs Duration (G+Y+Rc), s	15.6	8.8	19.4			28.2
Change Period (Y+Rc), s	4.0	4.0	5.0			5.0
Max Green Setting (Gmax), s	32.0	13.0	42.0			59.0
Max Q Clear Time (g_c+I1), s	11.5	5.2	13.6			5.6
Green Ext Time (p_c), s	0.2	0.0	0.8			0.4

Intersection Summary	
HCM 6th Ctrl Delay	13.6
HCM 6th LOS	B

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	20	407	502	1617	1415
v/c Ratio	0.29	0.72	0.77	0.53	0.87
Control Delay	69.8	39.6	40.5	4.7	36.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	69.8	39.6	40.5	4.7	36.2
Queue Length 50th (ft)	17	265	391	232	545
Queue Length 95th (ft)	44	349	m422	m291	#786
Internal Link Dist (ft)	1063			1080	560
Turn Bay Length (ft)	125		115		
Base Capacity (vph)	317	569	656	3027	1625
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.06	0.72	0.77	0.53	0.87

Intersection Summary

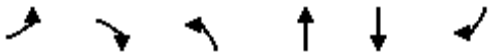
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	18	374	462	1488	1285	17
Future Volume (vph)	18	374	462	1488	1285	17
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	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)	1471	1428	1646	3292	3220	
Flt Permitted	0.95	1.00	0.06	1.00	1.00	
Satd. Flow (perm)	1471	1428	111	3292	3220	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	407	502	1617	1397	18
RTOR Reduction (vph)	0	7	0	0	1	0
Lane Group Flow (vph)	20	400	502	1617	1414	0
Confl. Peds. (#/hr)		3				
Heavy Vehicles (%)	13%	4%	1%	1%	3%	7%
Turn Type	Prot	pm+ov	pm+pt	NA	NA	
Protected Phases	8	1	1	6	2	
Permitted Phases		8	6			
Actuated Green, G (s)	4.2	51.2	115.3	115.3	63.8	
Effective Green, g (s)	4.2	51.2	115.3	115.3	63.8	
Actuated g/C Ratio	0.03	0.39	0.89	0.89	0.49	
Clearance Time (s)	4.5	4.5	4.5	6.0	6.0	
Vehicle Extension (s)	1.5	1.0	1.0	0.5	0.5	
Lane Grp Cap (vph)	47	611	653	2919	1580	
v/s Ratio Prot	0.01	c0.24	c0.28	0.49	c0.44	
v/s Ratio Perm		0.04	0.40			
v/c Ratio	0.43	0.65	0.77	0.55	0.90	
Uniform Delay, d1	61.7	32.2	31.2	1.6	30.1	
Progression Factor	1.00	1.00	1.23	2.67	1.00	
Incremental Delay, d2	2.2	1.9	2.3	0.3	8.3	
Delay (s)	64.0	34.1	40.8	4.7	38.3	
Level of Service	E	C	D	A	D	
Approach Delay (s)	35.5			13.3	38.3	
Approach LOS	D			B	D	

Intersection Summary			
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		

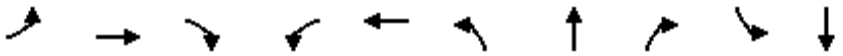
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	374	462	1488	1285	17
Future Volume (veh/h)	18	374	462	1488	1285	17
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	1573	1695	1736	1736	1709	1654
Adj Flow Rate, veh/h	20	407	502	1617	1397	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	13	4	1	1	3	7
Cap, veh/h	324	659	456	2319	1399	18
Arrive On Green	0.22	0.22	0.48	1.00	0.43	0.43
Sat Flow, veh/h	1498	1437	1654	3386	3368	42
Grp Volume(v), veh/h	20	407	502	1617	691	724
Grp Sat Flow(s),veh/h/ln	1498	1437	1654	1650	1624	1701
Q Serve(g_s), s	1.4	27.8	31.5	0.0	55.2	55.3
Cycle Q Clear(g_c), s	1.4	27.8	31.5	0.0	55.2	55.3
Prop In Lane	1.00	1.00	1.00			0.02
Lane Grp Cap(c), veh/h	324	659	456	2319	692	725
V/C Ratio(X)	0.06	0.62	1.10	0.70	1.00	1.00
Avail Cap(c_a), veh/h	324	659	456	2319	692	725
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.17	0.17	1.00	1.00
Uniform Delay (d), s/veh	40.5	26.6	26.6	0.0	37.2	37.3
Incr Delay (d2), s/veh	0.0	1.3	51.5	0.3	33.8	33.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	9.7	15.0	0.1	27.9	29.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	40.5	27.9	78.1	0.3	71.0	70.5
LnGrp LOS	D	C	F	A	E	E
Approach Vol, veh/h	427			2119	1415	
Approach Delay, s/veh	28.5			18.7	70.7	
Approach LOS	C			B	E	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	36.0	61.4				97.4	32.6
Change Period (Y+Rc), s	4.5	6.0				6.0	4.5
Max Green Setting (Gmax), s	31.5	55.4				91.4	28.1
Max Q Clear Time (g_c+I1), s	33.5	57.3				2.0	29.8
Green Ext Time (p_c), s	0.0	0.0				4.1	0.0

Intersection Summary		
HCM 6th Ctrl Delay		38.4
HCM 6th LOS		D



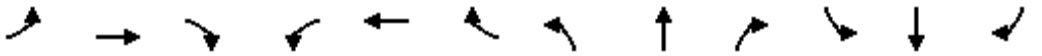
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	60	129	345	265	291	438	1818	245	46	1569
v/c Ratio	0.65	0.55	0.39	0.81	0.84	0.73	0.98	0.28	0.59	1.18
Control Delay	89.9	59.9	22.5	74.9	68.3	58.5	45.2	9.3	76.4	114.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.9	59.9	22.5	74.9	68.3	58.5	45.2	9.3	76.4	114.0
Queue Length 50th (ft)	50	102	80	113	228	179	~861	47	39	~839
Queue Length 95th (ft)	97	158	129	157	311	#338	#1102	114	m49	#988
Internal Link Dist (ft)		939			288		444			1080
Turn Bay Length (ft)	150		300	75		300		200	170	
Base Capacity (vph)	127	350	948	421	446	597	1861	881	80	1335
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.37	0.36	0.63	0.65	0.73	0.98	0.28	0.57	1.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

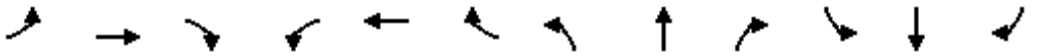
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	125	335	257	199	83	425	1763	238	45	1495	27
Future Volume (vph)	58	125	335	257	199	83	425	1763	238	45	1495	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	5.0	4.5		4.5	5.5	5.5	4.5	6.0	
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1630	1750	2509	3043	1646		3162	3260	1446	1583	3220	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1630	1750	2509	3043	1646		3162	3260	1446	1583	3220	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	60	129	345	265	205	86	438	1818	245	46	1541	28
RTOR Reduction (vph)	0	0	70	0	13	0	0	0	58	0	1	0
Lane Group Flow (vph)	60	129	275	265	278	0	438	1818	187	46	1568	0
Confl. Peds. (#/hr)	4		4	4		4	3		2	2		3
Confl. Bikes (#/hr)						3			2			
Heavy Vehicles (%)	2%	0%	3%	6%	1%	1%	2%	2%	0%	5%	3%	0%
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	6.7	18.4	43.0	14.1	26.3		24.6	72.4	72.4	5.6	52.9	
Effective Green, g (s)	6.7	18.4	43.0	14.1	26.3		24.6	72.4	72.4	5.6	52.9	
Actuated g/C Ratio	0.05	0.14	0.33	0.11	0.20		0.19	0.56	0.56	0.04	0.41	
Clearance Time (s)	4.5	4.5	4.5	5.0	4.5		4.5	5.5	5.5	4.5	6.0	
Vehicle Extension (s)	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lane Grp Cap (vph)	84	247	916	330	332		598	1815	805	68	1310	
v/s Ratio Prot	0.04	0.07	0.06	c0.09	c0.17		c0.14	c0.56		0.03	c0.49	
v/s Ratio Perm			0.05						0.13			
v/c Ratio	0.71	0.52	0.30	0.80	0.84		0.73	1.00	0.23	0.68	1.20	
Uniform Delay, d1	60.7	51.7	32.3	56.6	49.8		49.6	28.8	14.7	61.3	38.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.83	
Incremental Delay, d2	21.2	0.9	0.1	12.5	16.0		4.0	21.5	0.7	10.4	92.7	
Delay (s)	81.9	52.6	32.4	69.1	65.8		53.6	50.3	15.3	71.9	124.6	
Level of Service	F	D	C	E	E		D	D	B	E	F	
Approach Delay (s)		42.8			67.3			47.5			123.1	
Approach LOS		D			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	72.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	96.3%	ICU Level of Service	F
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)	58	125	335	257	199	83	425	1763	238	45	1495	27
Future Volume (veh/h)	58	125	335	257	199	83	425	1763	238	45	1495	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	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	1723	1750	1709	1668	1736	1736	1723	1723	1750	1682	1709	1750
Adj Flow Rate, veh/h	60	129	345	265	205	86	438	1818	0	46	1541	28
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	0	3	6	1	1	2	2	0	5	3	0
Cap, veh/h	75	253	651	309	234	98	360	1852		57	1593	29
Arrive On Green	0.05	0.14	0.14	0.10	0.20	0.20	0.11	0.57	0.00	0.05	0.65	0.65
Sat Flow, veh/h	1641	1750	2514	3082	1153	484	3183	3273	1483	1602	3263	59
Grp Volume(v), veh/h	60	129	345	265	0	291	438	1818	0	46	766	803
Grp Sat Flow(s),veh/h/ln	1641	1750	1257	1541	0	1637	1591	1637	1483	1602	1624	1698
Q Serve(g_s), s	4.7	8.9	15.4	11.0	0.0	22.4	14.7	70.5	0.0	3.7	57.7	58.1
Cycle Q Clear(g_c), s	4.7	8.9	15.4	11.0	0.0	22.4	14.7	70.5	0.0	3.7	57.7	58.1
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	75	253	651	309	0	332	360	1852		57	793	829
V/C Ratio(X)	0.80	0.51	0.53	0.86	0.00	0.88	1.22	0.98		0.81	0.97	0.97
Avail Cap(c_a), veh/h	129	350	791	427	0	432	360	1852		62	793	829
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	0.44	0.44	0.44
Uniform Delay (d), s/veh	61.4	51.4	41.5	57.5	0.0	50.2	57.6	27.6	0.0	61.5	21.8	21.9
Incr Delay (d2), s/veh	7.1	0.6	0.2	9.2	0.0	12.5	120.4	17.0	0.0	24.5	14.6	14.5
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	2.1	3.9	4.8	4.7	0.0	10.3	11.9	30.5	0.0	1.9	21.4	22.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.6	52.0	41.8	66.7	0.0	62.7	178.0	44.6	0.0	86.0	36.4	36.4
LnGrp LOS	E	D	D	E	A	E	F	D		F	D	D
Approach Vol, veh/h		534			556			2256	A		1615	
Approach Delay, s/veh		47.2			64.6			70.5			37.8	
Approach LOS		D			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.2	69.5	10.4	30.9	9.1	79.5	18.1	23.3
Change Period (Y+Rc), s	4.5	6.0	4.5	4.5	4.5	* 6	5.0	4.5
Max Green Setting (Gmax), s	14.7	51.3	10.2	34.3	5.0	* 62	18.0	26.0
Max Q Clear Time (g_c+I1), s	16.7	60.1	6.7	24.4	5.7	72.5	13.0	17.4
Green Ext Time (p_c), s	0.0	0.0	0.0	0.3	0.0	0.0	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	56.7
HCM 6th LOS	E

Notes

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

User approved changes to right turn type.

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

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	185	124	205	112	19	8	3	165	37	6	11
Future Vol, veh/h	4	185	124	205	112	19	8	3	165	37	6	11
Conflicting Peds, #/hr	0	0	13	13	0	0	7	0	0	0	0	7
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	110	-	-	225	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	9	0	11	0	100	0	0	0	0	0	0
Mvmt Flow	4	185	124	205	112	19	8	3	165	37	6	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	131	0	0	322	0	0	815	809	260	871	862	129
Stage 1	-	-	-	-	-	-	268	268	-	532	532	-
Stage 2	-	-	-	-	-	-	547	541	-	339	330	-
Critical Hdwy	4.1	-	-	4.21	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.299	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1467	-	-	1189	-	-	298	317	784	274	295	926
Stage 1	-	-	-	-	-	-	742	691	-	535	529	-
Stage 2	-	-	-	-	-	-	525	524	-	680	649	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1467	-	-	1174	-	-	245	258	774	185	240	920
Mov Cap-2 Maneuver	-	-	-	-	-	-	245	258	-	185	240	-
Stage 1	-	-	-	-	-	-	731	681	-	533	436	-
Stage 2	-	-	-	-	-	-	419	432	-	531	639	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	5.3	11.5	25.6
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	248	774	1467	-	-	1174	-	-	228
HCM Lane V/C Ratio	0.044	0.213	0.003	-	-	0.175	-	-	0.237
HCM Control Delay (s)	20.2	10.9	7.5	-	-	8.7	-	-	25.6
HCM Lane LOS	C	B	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0.1	0.8	0	-	-	0.6	-	-	0.9

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	181	19	76	165	44	23	5	127	34	1	7
Future Vol, veh/h	7	181	19	76	165	44	23	5	127	34	1	7
Conflicting Peds, #/hr	0	0	37	37	0	0	12	0	0	0	0	12
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	110	-	-	225	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	9	0	3	7	0	0	0	0	0	0	0
Mvmt Flow	7	181	19	76	165	44	23	5	127	34	1	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	209	0	0	237	0	0	597	603	228	610	590	199
Stage 1	-	-	-	-	-	-	242	242	-	339	339	-
Stage 2	-	-	-	-	-	-	355	361	-	271	251	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1374	-	-	1324	-	-	418	416	816	409	423	847
Stage 1	-	-	-	-	-	-	766	709	-	680	643	-
Stage 2	-	-	-	-	-	-	666	629	-	739	703	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1374	-	-	1277	-	-	375	376	787	323	382	837
Mov Cap-2 Maneuver	-	-	-	-	-	-	375	376	-	323	382	-
Stage 1	-	-	-	-	-	-	735	681	-	677	604	-
Stage 2	-	-	-	-	-	-	613	591	-	612	675	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	2.1	11.4	16.3
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	375	787	1374	-	-	1277	-	-	361
HCM Lane V/C Ratio	0.075	0.161	0.005	-	-	0.06	-	-	0.116
HCM Control Delay (s)	15.4	10.5	7.6	-	-	8	-	-	16.3
HCM Lane LOS	C	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.2	0.6	0	-	-	0.2	-	-	0.4

Project Name:	Titan Hill Multifamily
Project Number:	1774
Analysis Period:	Future 2025 Horizon Year Scenarios
Scenario:	With and Without Project, ODOT Design Hour (PM)

Intersection	Wallace at Glen (PM Peak Hour, Year 2025 No-Build)												Notes
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Adjust Flow Rate		129	325	265			402				1506		HCM2000 Used for RTOR on EBR
Saturated Flow Rate		1750	2512	3082			3183				3261		HCM6th
	0	0.073714	0.129379	0.085983	0	0	0.126296	0	0	0	0.461822	0	
Cycle Length	130												
Lost Time	20										v/c Ratio=	1.036684	

Intersection	Wallace at Glen (PM Peak Hour, Year 2025 With Project)												
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Adjust Flow Rate		129	345	265			438				1541		HCM2000 Used for RTOR on EBR
Saturated Flow Rate		1750	2514	3082			3183				3263		HCM6th
	0	0.073714	0.137232	0.085983	0	0	0.137606	0	0	0	0.472265	0	
Cycle Length	130												
Lost Time	20										v/c Ratio=	1.071672	

Change in Operations:	0.034989

Intersection	Wallace at Orchard Hts (PM Peak Hour, Year 2025 No-Build)												
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Adjust Flow Rate	20		370				437				1397		Only shows 8 EB RTOR, seems very low for a dedicated lane; likely closer to 100 (3 per cycle)
Saturated Flow Rate	1498		1437				1654				3368		HCM2000 implies one RTOR for every three cycles
	excluded		0.257481	0	0	0	0.264208	0	0	0	0.414786	0	
Cycle Length	130												
Lost Time	15										v/c Ratio=	1.058624	

Intersection	Wallace at Orchard Hts (PM Peak Hour, Year 2025 With Project)												
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Adjust Flow Rate	20		407				502				1397		Only shows 7 EB RTOR, this is unrealistic for a dedicated lane.
Saturated Flow Rate	1498		1437				1654				3368		
	excluded		0.283229	0	0	0	0.303507	0	0	0	0.414786	0	
Cycle Length	130												
Lost Time	15										v/c Ratio=	1.132155	

Change in Operations:	0.073531