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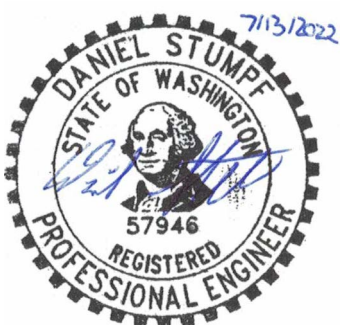

Monte Verde Subdivision

Transportation Impact Study

Camas, Washington

Date:
July 13, 2022

Prepared for:
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Executive Summary

1. The proposed Monte Verde Subdivision will include the construction of a residential subdivision located on a single property addressed at 22205 NE 28th Street in Camas, Washington. The proposed development will include the construction of 34 single-family detached houses, removing 1 existing house for a net increase of 33 houses. Access to the site will be provided via the proposed extension of NE Hargrave Street to the south of NE 28th Street.
2. The trip generation calculations show that the proposed project is projected to generate an additional 23 morning peak hour trips, 31 evening peak hour trips, and 310 average weekday trips.
3. Based on the 6 projected evening peak hour trip impacts to the intersection NE 192nd Avenue at NE 13th Street, the proposed Monte Verde Subdivision is required to contribute approximately $2,400 toward a City of Vancouver intersection improvement project.
4. No significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.
5. Provided any obstructing on-site foliage near the proposed access location is removed following redevelopment of the site, adequate intersection sight distances to the east and west of the proposed site access can be made available to ensure safe and efficient operation along NE 28th Street. No other mitigation is necessary or recommended with regard to sight distance at the proposed access intersection.
6. Left-turn lane warrants are not projected to be met in the eastbound and westbound directions of travel at the intersection of NE 232nd Avenue at NE 28th Street. The intersection of N Hargrave Street at NE 28th Street is currently served by a center two-way left-turn lane on the east and west intersection legs. Accordingly, no new left-turn lanes are necessary or recommended at any of the study intersections.
7. All-way stop warrants and traffic signal warrants at the study intersections are not projected to be met at the study intersections by the 2024 buildout year of the site. Accordingly, installation of all-way stop-controls or traffic signals at the study intersections are not necessary or recommended as part of the Monte Verde Subdivision application.
8. The proposed site access will be located opposite of N Hargrave Street, with the nearest intersecting roadways along NE 28th Street being N Juniper Street to the east (approximately 700 feet away) and N Boxwood Street to the west (approximately 650 feet away). Therefore, the proposed site access will meet the City of Camas' access spacing standards, whereby no access related mitigation is necessary.
9. All study intersections are currently operating acceptably per City of Camas and Clark County standards and are projected to continue operating acceptably through the 2024 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections.
10. All applicable turning movements at the study intersections have adequate storage space to accommodate projected 95th percentile queue, where queues are not expected to extend back to adjacent public intersections. Accordingly, no intersection queuing related mitigation is necessary or recommended as part of the proposed development.

Project Description

Introduction

The proposed Monte Verde Subdivision will include the construction of a residential subdivision located on a single property addressed at 22205 NE 28th Street in Camas, Washington. The proposed development will include the construction of 34 single-family detached houses, removing 1 existing house for a net increase of 33 houses. Access to the site will be provided via the proposed extension of NE Hargrave Street to the south of NE 28th Street.

Based on correspondence with City of Camas, City of Vancouver, and Clark County staff, the report conducts safety and capacity/level of service analyses at the following intersections:

1. N Hargrave Street at NE 28th Street (Site Access); and
2. NE 232nd Avenue at NE 28th Street.

The purpose of this study is to determine whether the transportation system within the vicinity of the site is capable of safely and efficiently supporting the existing and proposed uses, and to determine any mitigation that may be necessary to do so. Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations is included in the appendix to this report.

Location Description

The project site is located south of NE 28th Street, east of NE Goodwin Road, and west at NE 232nd Avenue in Camas, Washington. The subject site is located within a developing residential area of the City with a residential subdivision to the north, lower density single-family detached houses to the east and west, and undeveloped/forested land to the south.

The site consists of a single assessor parcel (parcel 173184000) which encompasses an approximate total of 8.84 acres. A single-family detached house and several ancillary structures are currently built on-site. Following redevelopment of the site the existing house these ancillary structures removed. The site is currently served by two driveways along NE 28th Street, where the east driveway will be removed and the west driveway replaced by the proposed extension of N Hargrave Street.

Figure 1 presents an aerial image of the nearby vicinity with the project site outlined in yellow.

Figure 1: Aerial Photo of Site Vicinity (Image from Google Earth)

Vicinity Streets

The proposed development is expected to impact three roadways near the site. Table 1 provides a description of each vicinity roadway.

Table 1: Vicinity Roadway Descriptions

Street Name	Jurisdiction	Functional Classification	Speed (MPH)	On-Street Parking	Curbs & Sidewalks	Bicycle Lanes
NE 28th Street	Camas/Clark County	Arterial/Rural Major Collector	40/50	Not Permitted	Partial North	None
N Hargrave Street	Clark County	Local Street	25	Permitted Both Sides	Both Sides	None
NE 232nd Avenue	Clark County	Rural Major Collector	45	Not Permitted	None	None

Table Notes: Functional classification based on City of Camas Traffic Impact Fee Update and Clark County 2016 Arterial Atlas.

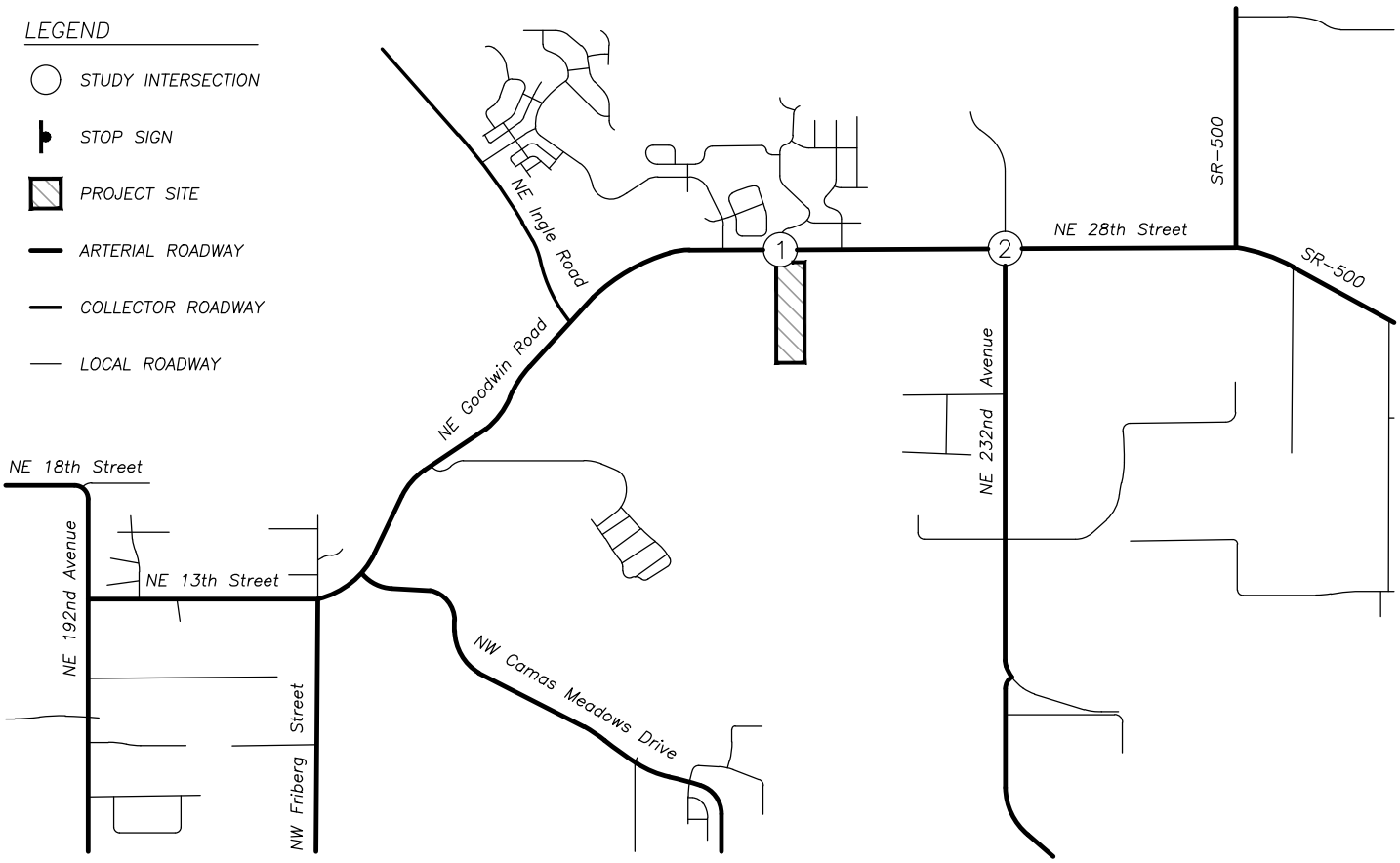
Study Intersections

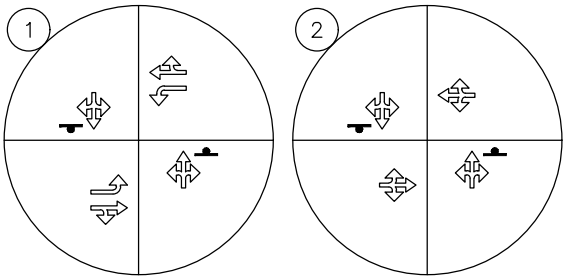
A majority of site trips generated by the proposed development are expected to impact two existing, nearby intersections of significance. A summarized description of these study intersections is provided in Table 2.

Table 2: Study Intersection Descriptions

Number	Intersection	Geometry	Traffic Control	Phasing/Stopped Approaches
1	N Hargrave Street at NE 28th Street	Three-Legged	Stop Controlled	NB/SB Stop-Controlled Approaches
2	NE 232nd Avenue	Four-Legged	Stop Controlled	NB/SB Stop-Controlled Approaches

A vicinity map showing the project site, vicinity streets, and study intersection configurations are shown in Figure 2.





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VICINITY MAP

Figure 2

Monte Verde Subdivision

7/13/2022

Site Trips

Trip Generation

The proposed development will include the construction of a 34-lot residential subdivision, removing 1 existing single-family detached house for a net increase of 33 houses. To estimate the number of trips that are currently and will be generated by the existing and proposed uses, trip rates from the *Trip Generation Manual*[1] were used. Specifically, data from land use code 210, *Single-Family Detached Housing*, was used to estimate site trip generation based on the number of dwelling units.

The trip generation calculations show that the proposed project is projected to generate an additional 23 morning peak hour trips, 31 evening peak hour trips, and 310 average weekday trips. The trip generation estimates are summarized in Table 3. Detailed trip generation calculations are included in the technical appendix.

Table 3: Trip Generation Summary

	ITE Code	Size/Rate	Morning Peak Hour			Evening Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
Existing Conditions	210	1 dwelling units	0	1	1	1	0	1	10
Proposed Conditions	210	34 dwelling units	6	18	24	20	12	32	320
Net New Trips		**33 dwelling units**	**6**	**17**	**23**	**19**	**12**	**31**	**310**

Trip Distribution

A trip distribution of site trips for the proposed development was estimated based on the geographical location of the project site, locations of likely trip origins and destinations, locations of major transportation facilities in the site vicinity, and US residential/employment census data retrieved at <https://onthemap.ces.census.gov/>. The following trip distribution was estimated:

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

The following trip distribution is projected:

- Approximately 25 percent of site trips will travel to/from the northwest along NE Ingle Road;
- Approximately 20 percent of site trips will travel to/from the south along NE 232nd Avenue;
- Approximately 15 percent of site trips will travel to/from the south along NE 192nd Avenue;
- Approximately 15 percent of site trips will travel to/from the east along SR-500;
- Approximately 10 percent of site trips will travel to/from the southeast along NW Camas Meadows Drive;
- Approximately 5 percent of site trips will travel to/from the west along NE 18th Street;
- Approximately 5 percent of site trips will travel to/from the south along NW Friberg Street; and
- Approximately 5 percent of site trips will travel to/from the north along SR-500.

The trip distribution and assignment for the site trips generated during the morning and evening peak hours are shown in Figure 3.

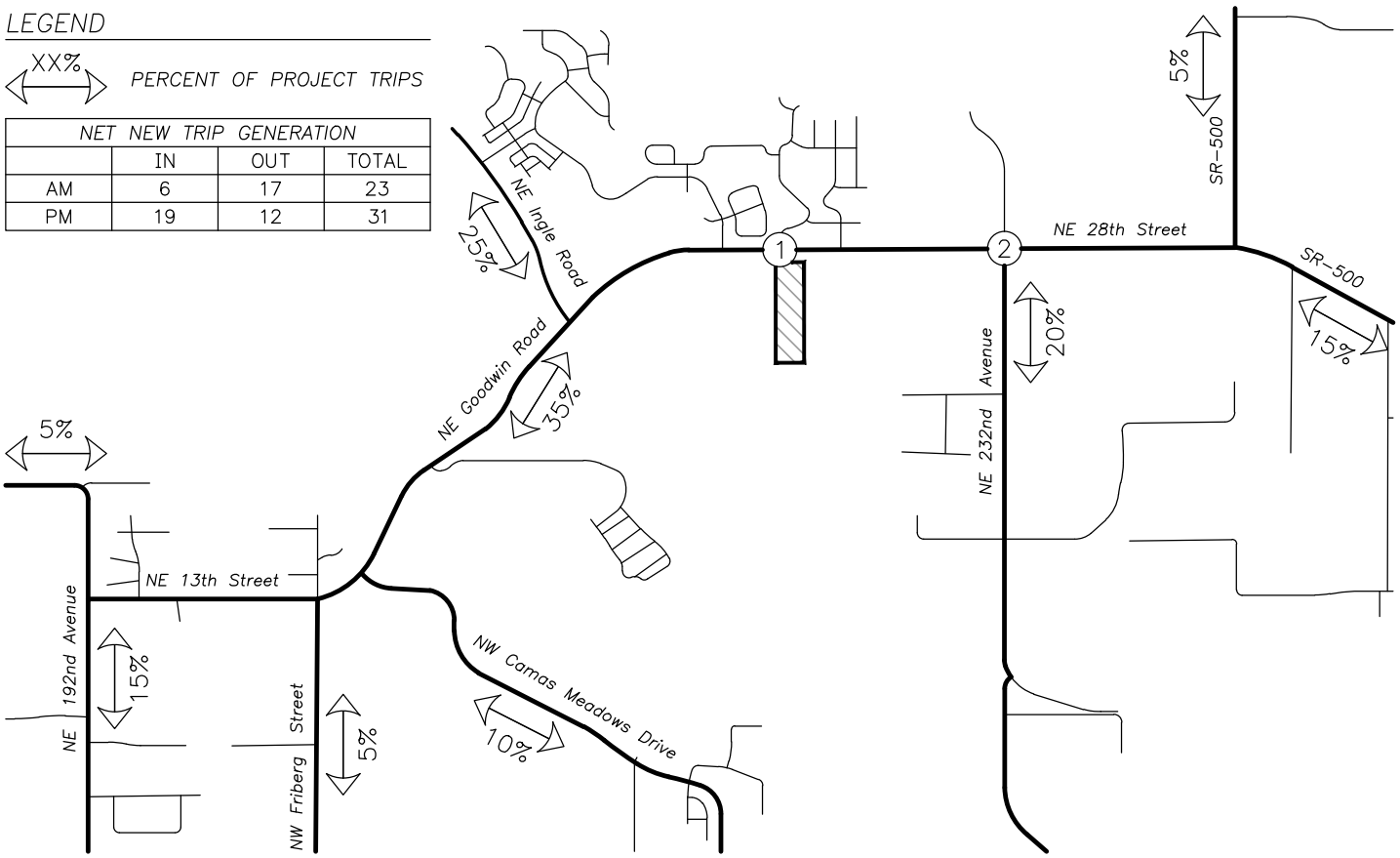
Proportionate Share Contributions

Based on input provided by City of Vancouver staff, proportionate share fees are being collected at the intersection of NE 192nd Avenue at NE 13th Street in order to help fund an intersection improvement project. It is estimated that approximately 20 percent of site trips will impact this intersection. Table 4 below details this transportation improvement project and proportionate share fee contributions attributable to the proposed development.

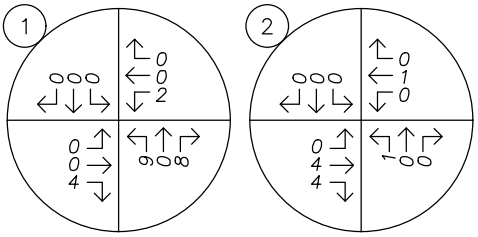
Table 4: Proportionate Share Contributions

Project Location	Unit Cost Per Trip		Peak Hour Trip Impact		Proportionate Share Contribution
NE 192nd Avenue at NE 13th Street	$400	PM	6	PM	$2,400

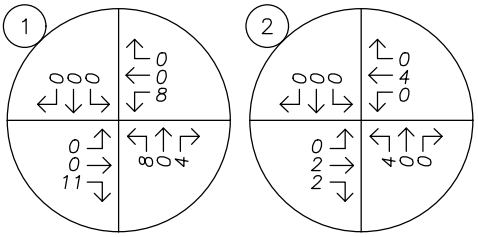
Based on the projected evening peak hour trip impacts to the transportation facility detailed in Table 5, the proposed Monte Verde Subdivision is required to contribute approximately $2,400 toward this intersection improvement project.



AM PEAK HOUR



PM PEAK HOUR



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SITE TRIP DISTRIBUTION & ASSIGNMENT
Proposed Development Plan - Site Trips
AM & PM Peak Hours

Figure 3
Monte Verde Subdivision
7/13/2022

Traffic Volumes

Existing Conditions

Due to the ongoing COVID-19 viral pandemic, as of mid-March 2020 traffic volumes around Clark County have been depressed relative to normal conditions whereby traditional traffic count data collection methods are typically not recommended. Based on correspondence with City of Camas staff, the collection of new traffic counts without COVID-19 adjustments is acceptable. However, Clark County staff had requested analysis of one intersection under County jurisdiction whereby adjustments need to be applied to new counts per the Clark County Management Decision memorandum, dated March 20, 2020. For consistency, adjustment factors were calculated and applied to all study intersections.

A review of available traffic count data yielded traffic counts at the following locations:

- NE 28th Street west of NE 232nd Avenue (September 24, 2019).

Given these available counts, the following methodology for data collection and volume adjustment was utilized:

- Historical 2019 traffic counts were grown to reflect 2022 existing conditions by applying a 1.26 percent per year compounded growth factor, in accordance with the Clark County Management Decision memorandum.
- Since 2018 - early 2020 traffic counts are not available at the study intersections, current year 2022 traffic counts were collected at these intersections on Wednesday, June 29, 2022, from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM.
- The 2019 historical count data (grown to reflect 2022 conditions) and the recently collected 2022 counts at the intersection of NE 232nd Avenue at NE 28th Street compared. Based on the difference in peak hour volumes along NE 28th Street, just west of NE 232nd Avenue, morning and evening peak hour adjustment factors were calculated. These adjustment factors are intended to estimate normal traffic conditions without impacts from the COVID-19 virus (i.e. normal commuter patterns, businesses open, etc).
- The calculated adjustment factors were applied to the recently collected year 2022 traffic counts for all study intersections.

Table 5 presents the calculated adjustment factors for the morning and evening peak hours.

Table 5: COVID-19 Adjustment Factor Calculations

	AM Peak Hour (7:00 AM - 9:00 AM)	PM Peak Hour (4:00 PM - 6:00 PM)
NE 28th Street (West of NE 232nd Avenue)		
Collected 2022 Peak Hour Volumes	614	1,170
Historical 2019 Peak Hour Volumes	886	1,095
Compounded Growth Factor (1.26% Per Year Over 3 Years)	1.0383	1.0383
Historical 2019 Peak Hour Volumes (Grown to 2022)	920	1,137
New Volumes > Grown Historical Volumes?	No	Yes
Adjustment Factor	**1.498**	**1.000**

Figure 4 shows the adjusted year 2022 existing traffic volumes at the study intersections during the morning and evening peak hours.

Background Conditions

Volume Growth

To provide analysis of the impact of the proposed development on the nearby transportation facilities, an estimate of future traffic volumes is required. In order to approximate the future year 2024 traffic volumes at the study intersections, a compounded growth rate of two percent per year for an assumed buildout condition of two years was applied to the adjusted year 2022 existing traffic volumes.

In-Process Data

In addition to the traffic volume growth described above, there are several in-process developments that are currently approved/proposed for construction within the site vicinity that are expected to impact nearby study intersections. The in-process developments include the following:

1. CJ Dens East Subdivision (0 percent developed as of June 2022)
2. Green Mountain B1 South Phase (0 percent developed as of June 2022)
3. Green Mountain Estates Phases 1-7 (50 percent buildout as of June 2022)

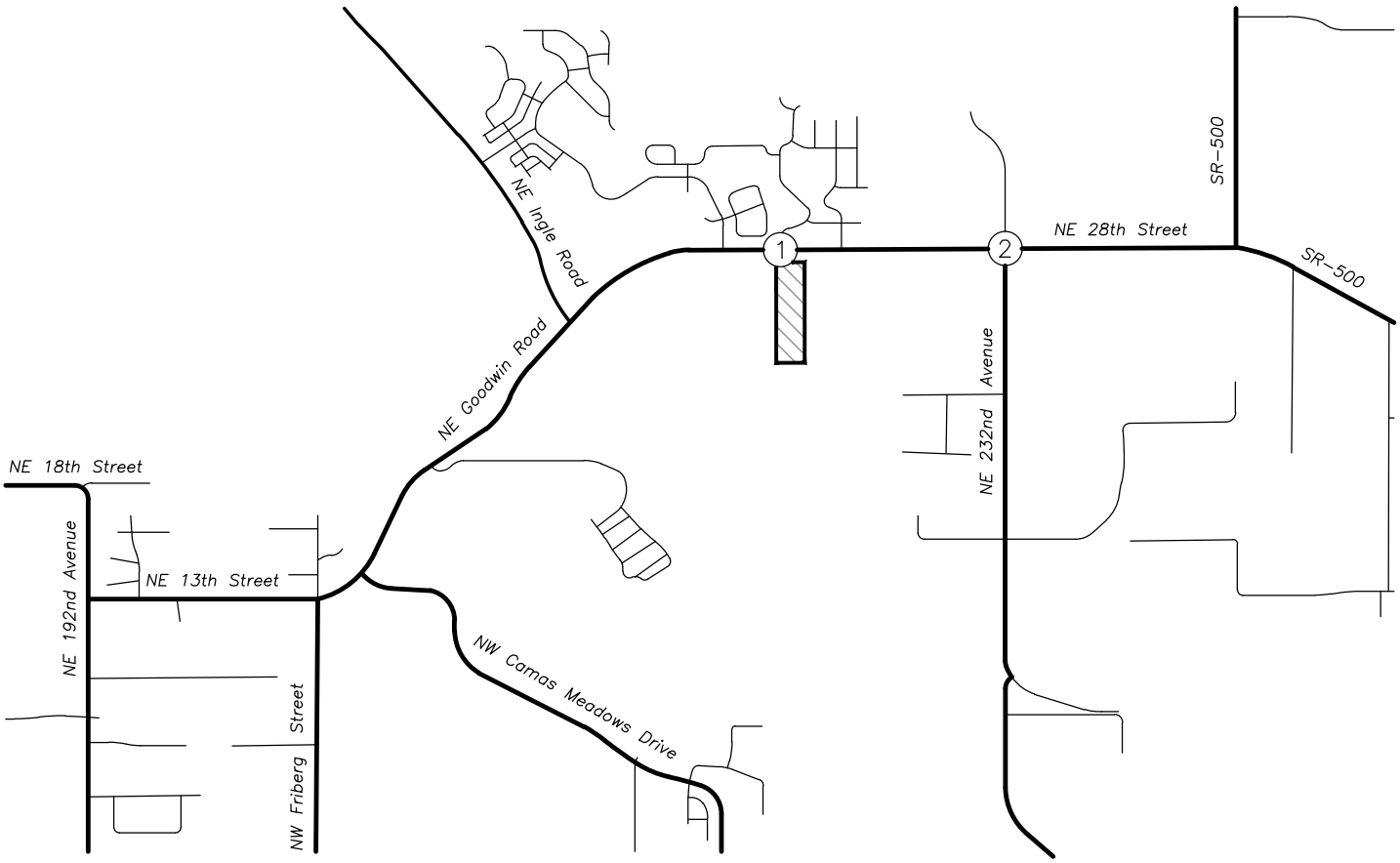
The in-process developments are currently not fully contributing trips to the transportation system but may potentially be by the assumed 2024 buildout year of the site. Additional trips corresponding to each in-process development were added to the existing year traffic volumes in addition to the two years of traffic growth at each of the applicable study intersections. To maintain a conservative analysis of operation at the study intersections, all in-process developments were assumed to be constructed by year 2024. Figure A in the technical appendix shows the in-process development trips at the study intersections during the morning and evening peak hours.

Figure 5 shows the projected year 2024 background traffic volumes at the study intersections during the morning and evening peak hours.

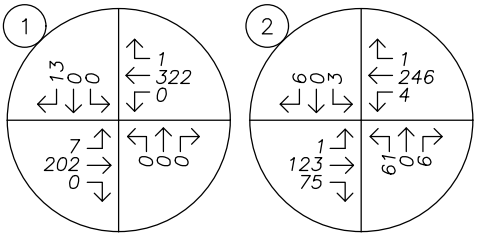
Buildout Conditions

Peak hour trips calculated to be generated by the proposed development, as described earlier within the *Site Trips* section, were added to the projected year 2024 background traffic volumes to obtain the expected 2024 site buildout volumes.

Figure 6 show the year 2024 buildout traffic volumes at the study intersections during the morning and evening peak hours.



AM PEAK HOUR



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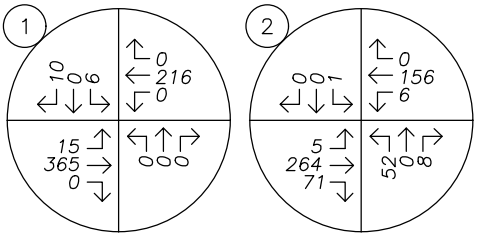

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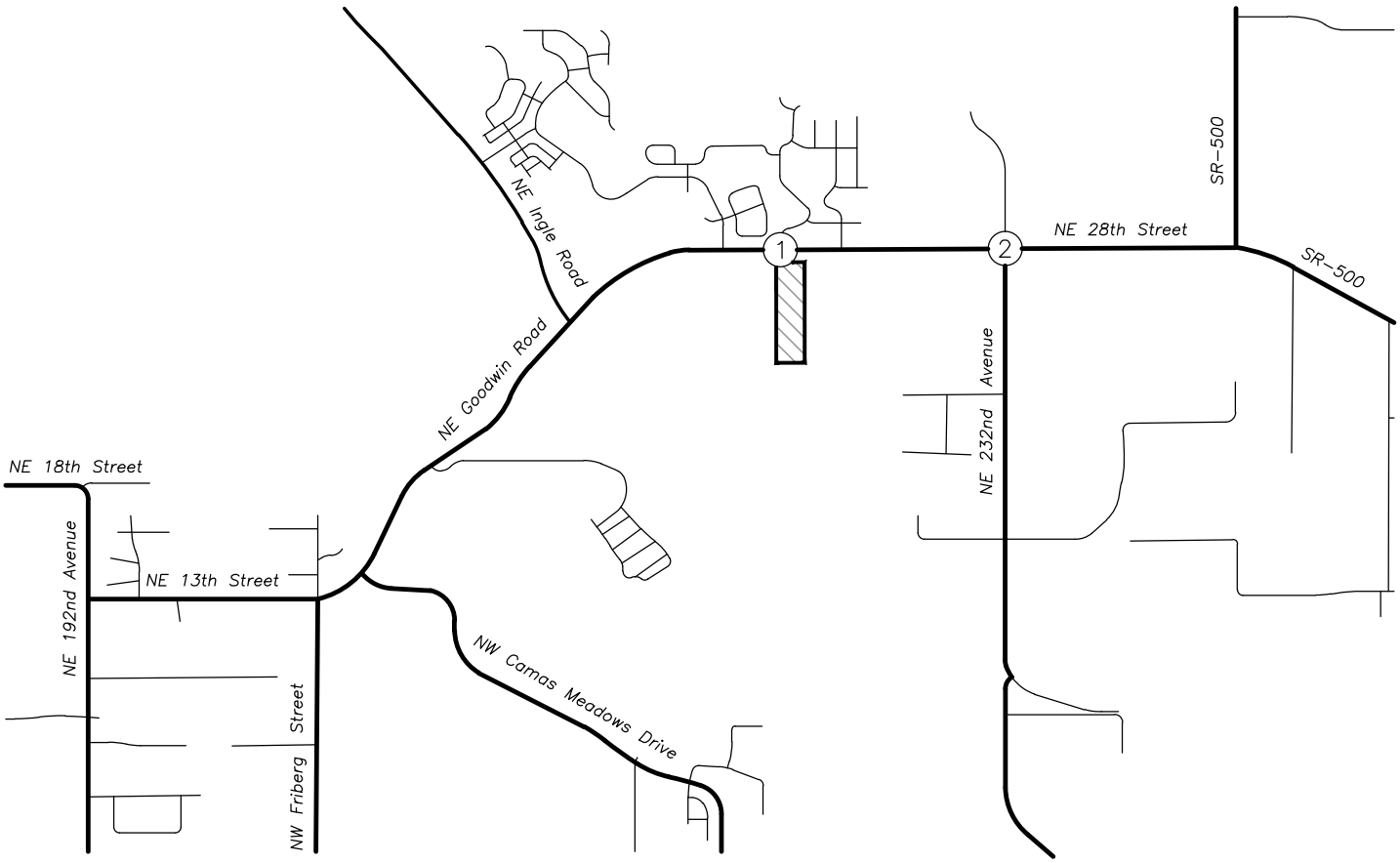
TRAFFIC VOLUMES
Year 2022 Existing Conditions
AM & PM Peak Hours

Figure 4
Monte Verde Subdivision
7/13/2022



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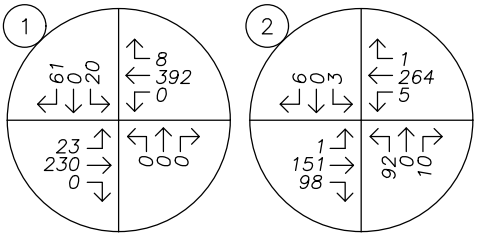
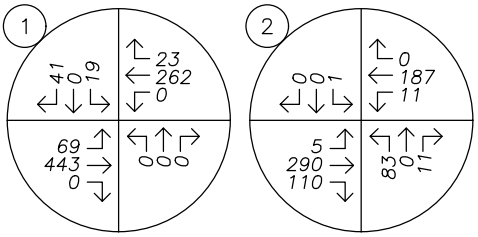


PM PEAK HOUR



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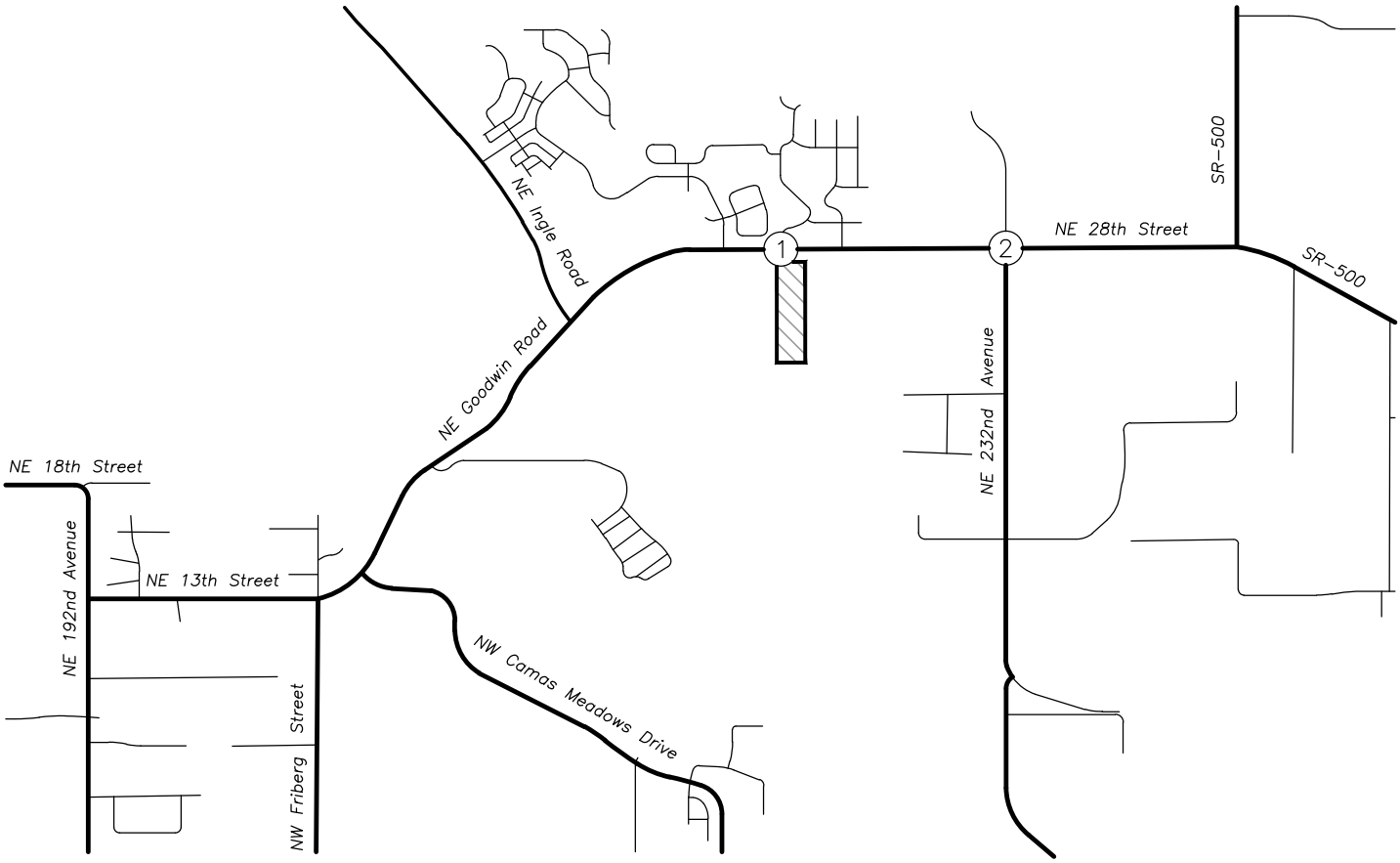
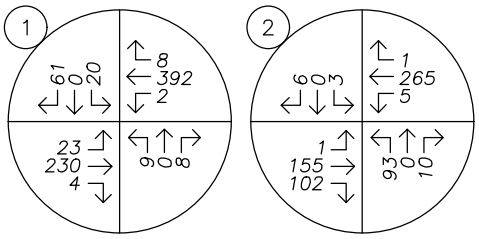
TRAFFIC VOLUMES
Year 2024 Background Conditions
AM & PM Peak Hours

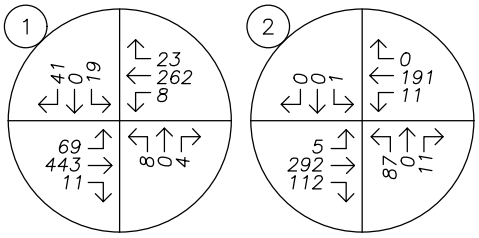
Figure 5
Monte Verde Subdivision
7/13/2022



AM PEAK HOUR



PM PEAK HOUR



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TRAFFIC VOLUMES
Year 2024 Buildout Conditions
AM & PM Peak Hours

Figure 6
Monte Verde Subdivision
7/13/2022

Safety Analysis

Crash History Review

Using data obtained from the Washington Department of Transportation (WSDOT) Crash Data and Reporting Branch, a review of the most recent available five years of crash history (January 2017 to December 2021) at the study intersections was performed. The crash data was evaluated based on the number of crashes, the type of collisions, the severity of the collisions, and the resulting crash rate for the intersection.

Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak hour represents approximately 10 percent of the annual average daily traffic (AADT) at the intersection. Crash rates in excess of 1.00 crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation.

With regard to crash severity, WSDOT classifies crashes in the following categories:

- *No Apparent Injury* (NA);
- *Possible Injury* (P);
- *Suspected Minor Injury* (SM);
- *Suspected Serious Injury* (SS); and
- *Fatality* or *Fatal Injury*.

Table 6 provides a summary of crash types while Table 7 summarizes crash severities and rates for each of the applicable study intersections. Crash data is included in the technical appendix to this report.

Table 6: Crash Type Summary

Number	Intersection	Crash Type							Total
		Rear End	Turn	Angle	Fixed Object	Side swipe	Ped/ Bike	Other	
1	N Hargrave Street at NE 28th Street	1	0	0	0	0	0	0	1
2	NE 232nd Avenue at NE 28th Street	2	4	0	1	0	1	0	8

Table 7: Crash Severity and Rate Summary

Number	Intersection	Crash Severity					Total Crashes	AADT	Crash Rate
		NA	P	SM	SS	Fatal			
1	N Hargrave Street at NE 28th Street	0	1	0	0	0	1	6,120	0.08
2	NE 232nd Avenue at NE 28th Street	5	2	1	0	0	8	5,630	0.78

Table Notes: ***BOLDED*** *text indicates a crash rate in excess of 1.00 CMEV.*

Per Table 6, one crash at the intersection of NE 232nd Avenue at NE 28th Street involved a bicyclist. The crash occurred when the driver of a westbound truck collided with a bicyclist. No injuries were reported and the crash was classified as *No Apparent Injury*.

Based on a review of available crash data, no significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.

Sight Distance Evaluation

Intersection sight distance was measured for the proposed site access intersection approach along NE 28th Street and evaluated in accordance with the standards established in *A Policy of Geometric Design of Highways and Streets*[2]. According to AASHTO, the driver's eye is assumed to be approximately 15 feet from the near edge of the nearest travel lane of the intersecting street and at a height of 3.5 feet above the minor-street approach pavement. The vehicle driver's eye height along the major-street approach is assumed to be 3.5 feet above the cross-street pavement. Based on the posted speed of 40 mph along NE 28th Street, the minimum recommended intersection sight distances include the following:

- 445 feet to the east for left turning vehicles.
- 385 feet to the west for right turning vehicles.

Provided any obstructing on-site foliage near the access is removed following redevelopment of the site, sight distances to the east and west were measured to be in excess of 450 feet in both directions. Therefore, adequate intersection sight distances to the east and west of the proposed site access can be made available to ensure safe and efficient operation along NE 28th Street. No other mitigation is necessary or recommended with regard to sight distance at the proposed access intersection.

[2] American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 6th Edition, 2011.

Warrant Analysis

Left-turn lane, all-way stop-control, and preliminary traffic signal warrants were examined for the study intersections where such treatments would be applicable.

Left-Turn Lane Warrants

A left-turn refuge lane is primarily a safety consideration for the major-street, removing left-turning vehicles from the through traffic stream. The left-turn lane warrants used were developed from the *National Cooperative Highway Research Project's* (NCHRP) *Report 457*. Turn lane warrants were evaluated based on the number of advancing and opposing vehicles as well as the number of turning vehicles, the travel speed, and the number of through lanes.

Left-turn lane warrants are not projected to be met in the eastbound and westbound directions of travel at the intersection of NE 232nd Avenue at NE 28th Street. The intersection of N Hargrave Street at NE 28th Street is currently served by a center two-way left-turn lane on the east and west intersection legs. Accordingly, no new left-turn lanes are necessary or recommended at any of the study intersections.

All-Way Stop-Control Warrants

To determine whether the installation of all-way stop-controls is warranted or nearing warrants at the study intersections, the *Manual of Uniform Traffic Control Devices for Streets and Highways*[3] (MUTCD) was referenced. According to *Section 2B.07 Multi-Way Stop Applications* of the MUTCD, installation of a multi-way stop control may be implemented at an intersection given the following criteria are considered:

A. *Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.*

B. *Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.*

C. *Minimum volumes:*

   1. *The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day; and*

   2. *The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour; but*

[3] Federal Highway Administration (FTA), American Traffic Safety Services Association (ATSSA), Institute of Transportation Engineers (ITE), American Association of State Highway and Transportation Officials (AASHTO), *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD), 2009 Edition, 2010.

3. *If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 2.*

D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values, Criterion C.3 is excluded from this condition.

Reviewing the above criteria, neither *A* nor *B* are met, and *D* cannot be utilized due to *B* not being met at 80 percent of the minimum threshold. Taking into consideration *Criterion C* alone, all-way stop warrants at the study intersections are not projected to be met by the 2024 buildout year of the site due to volumes and the minor-street approach delays being less than 30 seconds (see the *Intersection Capacity Analysis* section for details).

Preliminary Traffic Signal Warrants

Preliminary traffic signal warrants were examined for the unsignalized study intersections to determine whether the installation of a new traffic signal will be warranted at the intersections by the 2024 buildout year of the site. Based on the analysis, traffic signal warrants are not projected to be met at any of the study intersections by the 2024 site buildout year. Accordingly, no new traffic signals are necessary at the study intersections as part of the Monte Verde Subdivision application.

Access Spacing

According to Table 3 of the City of Camas' Engineering Design Standards[4], the minimum and maximum spacing standards for Arterial roadways (i.e. NE 28th Street) are 660 feet and 1,000 feet, respectively. The proposed site access will be located opposite of N Hargrave Street, with the nearest intersecting roadways along NE 28th Street being N Juniper Street to the east (approximately 700 feet away, measured centerline-to-centerline) and N Boxwood Street to the west (approximately 650 feet away, measured centerline-to-centerline). Therefore, the proposed site access will meet the City of Camas' access spacing standards, whereby no access related mitigation is necessary.

[4] 03b_design_standards.pdf (cityofcamas.us)

Operational Analysis

Intersection Capacity Analysis

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

Performance Standards

According to the City of Camas Transportation Impact Study Guidelines[6], a minimum LOS C or better on minor and local streets, and D on collector/arterials or better should be maintained for traffic operations.

According to Clark County's Unified Development Code, Title 40.350 – *Transportation and Circulation*[7], Clark County's performance standards require unsignalized intersections to operate at LOS E or better unless traffic signal warrants are met. If traffic signal warrants are met, the intersection is required to operate at LOS D or better. Individual movements at signalized intersections of regional significance are to operate with average delays of less than two cycle lengths or 240 seconds, whichever is less.

Delay & Capacity Analysis

The LOS, delay, and v/c results of the capacity analysis are shown in Table 8 for the morning and evening peak hours. Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.

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

[6] transportation_impact_study.pdf (cityofcamas.us)

[7] Section 40.350.020 (codepublishing.com)

Table 8: Intersection Capacity Analysis Summary

Analysis Scenario	AM Peak Hour			PM Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
1. N Hargrave Street at NE 28th Street						
2022 Existing Conditions	B	11	0.02	B	11	0.03
2024 Background Conditions	B	13	0.17	B	13	0.13
2024 Buildout Conditions	B	13	0.17	B	14	0.14
2. NE 232nd Avenue at NE 28th Street						
2022 Existing Conditions	B	11	0.16	B	14	0.14
2024 Background Conditions	B	16	0.26	C	17	0.26
2024 Buildout Conditions	C	16	0.27	C	17	0.28

Table Notes: ***BOLDED*** *text indicates intersection operation above jurisdictional standards.*

Based on the results of the operational analysis, all study intersections are currently operating acceptably per City of Camas and Clark County standards and are projected to continue operating acceptably through the 2024 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections.

Intersection Queuing Analysis

In accordance with the City of Camas Transportation Impact Study Guidelines, a queuing analysis was conducted at the study intersections to determine whether sufficient storage is available at applicable turning movements to accommodate projected queues.

The queue lengths were projected based on the results of a Synchro/SimTraffic simulation, with the reported values representing the 95th percentile queue length. The 95th percentile queue is a statistical measurement which indicates there is a 5 percent chance that the queue may exceed this length during the analysis period; however, given this is a probability, the 95th percentile queue length may theoretically never be met or observed in the field.

The projected 95th percentile queue lengths reported in the simulation are presented in Table 9 for the morning and evening peak hours. Note the reported queue lengths were rounded up to the nearest five feet. Available lane storages at applicable turning movements were rounded to the nearest five feet. Detailed queuing analysis worksheets are included in the technical appendix to this report.

Table 9: Queuing Analysis Summary

		Available Storage (ft)	AM Peak Hour	PM Peak Hour
			95th (ft)	95th (ft)
1. N Hargrave Street at NE 28th Street				
2022 Existing Conditions	EB LT Lane	-	15	15
	WB LT Lane	-	0	0
	NB Lane	-	0	0
	SB Lane	-	35	50
2024 Background Conditions	EB LT Lane	-	30	40
	WB LT Lane	-	0	0
	NB Lane	-	0	0
	SB Lane	-	60	75
2024 Buildout Conditions	EB LT Lane	-	30	40
	WB LT Lane	-	10	20
	NB Lane	-	40	35
	SB Lane	-	55	80
2. NE 232nd Avenue at NE 28th Street				
2022 Existing Conditions	EB Lane	-	5	10
	WB Lane	-	10	20
	NB Lane	-	55	50
	SB Lane	-	35	10
2024 Background Conditions	EB Lane	-	5	10
	WB Lane	-	15	20
	NB Lane	-	60	60
	SB Lane	-	35	15
2024 Buildout Conditions	EB Lane	-	5	15
	WB Lane	-	15	25
	NB Lane	-	65	65
	SB Lane	-	35	10

Table Notes: ***BOLDED*** *text indicates queue length exceeds avaialble storage.*

Based on the intersection queuing analysis, all applicable turning movements at the study intersections have adequate storage space to accommodate projected 95th percentile queue, where queues are not expected to extend back to adjacent public intersections. Accordingly, no intersection queuing related mitigation is necessary or recommended as part of the proposed development.

Conclusions

No significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.

Provided any obstructing on-site foliage near the proposed access location is removed following redevelopment of the site, adequate intersection sight distances to the east and west of the proposed site access can be made available to ensure safe and efficient operation along NE 28th Street. No other mitigation is necessary or recommended with regard to sight distance at the proposed access intersection.

Left-turn lane warrants are not projected to be met in the eastbound and westbound directions of travel at the intersection of NE 232nd Avenue at NE 28th Street. The intersection of N Hargrave Street at NE 28th Street is currently served by a center two-way left-turn lane on the east and west intersection legs. Accordingly, no new left-turn lanes are necessary or recommended at any of the study intersections.

All-way stop warrants and traffic signal warrants at the study intersections are not projected to be met at the study intersections by the 2024 buildout year of the site. Accordingly, installation of all-way stop-controls or traffic signals at the study intersections are not necessary or recommended as part of the Monte Verde Subdivision application.

The proposed site access will be located opposite of N Hargrave Street, with the nearest intersecting roadways along NE 28th Street being N Juniper Street to the east (approximately 700 feet away) and N Boxwood Street to the west (approximately 650 feet away). Therefore, the proposed site access will meet the City of Camas' access spacing standards, whereby no access related mitigation is necessary.

All study intersections are currently operating acceptably per City of Camas and Clark County standards and are projected to continue operating acceptably through the 2024 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections.

All applicable turning movements at the study intersections have adequate storage space to accommodate projected 95th percentile queue, where queues are not expected to extend back to adjacent public intersections. Accordingly, no intersection queuing related mitigation is necessary or recommended as part of the proposed development.

Appendix A – Site Plan

Site Plan

Monte Verde Subdivision

Located in the SE ¼ of Section 21, T2N, R3E and in
the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

GENERAL NOTES

Applicant:
Pacific Lifestyle Homes
Ryan Stygar
11815 NE 99th Street
Vancouver, WA 98682
Office (360) 304-9901

OWNER:
Dwight Southern
22205 NE 28th Street
Camas, WA 98607

CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 173184-000
22205 NE 28th Street
Camas, WA 98607

LAND USE:
The applicant is proposing a 34 lot subdivision in the R7.5 zone.

Per Municipal Code section 18.09.060, density transfer is proposed with the inclusion of an improved park area. Both of the proposed park tracts have 0.5 acres of contiguous area (total park area of 0.9 acre). The city may provide additional flexibility to the minimum lot width standards with the proposed park area.

Existing Lot Area = 8.45 Acres
Proposed open space = 1 Acre
Minimum Proposed Lot Area = 5822 sq-ft
Maximum Proposed Lot Area = 8265 sq-ft
Average Lot Area = 6521 sq-ft
Min. Lot Width = 52.5'

Maximum Density = 5.8 d.u./net acre (43 lots)
Proposed Density = 4.2 d.u./net acre (33 lots)

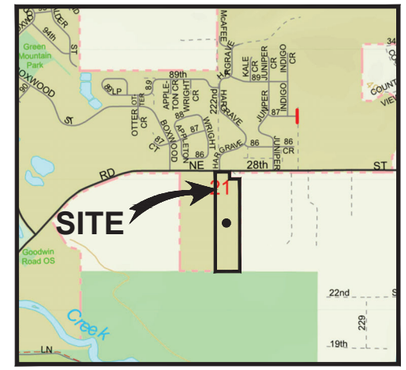
ENVIRONMENTAL CONSTRAINTS:
There are multiple Oregon white oak trees located on or near the site. There are no known water courses or water bodies, no areas within 100-year floodplain, no designated shoreline areas, no landslide or erosion hazard areas, no wetlands, no known significant historic resources and no known significant habitat onsite.

TRANSPORTATION:
For primary access to the site the applicant is proposing to construct a roadway connection to NE 28th Street that aligns with NE Hargrave Street. NE 28th Street is classified as a 3-lane collector/arterial. Half width improvements are proposed for this public roadway. Internal public roadways will consist of local access roadways with circulation provided to the east and west.

UTILITIES:
Stormwater runoff is proposed to be collected and routed to a detention facility located on the south end of the site, runoff generated from pollution generating surfaces will be treated using filter cartridges prior to entering the stormwater facility.

The site will be served by public water and sanitary sewer provided by the City of Camas. The connection point for both water and sewer are within NE 28th Street. Due to the existing grade of the site that slopes away from NE 28th Street, a majority of the lots will need to utilize a grinder pump system.

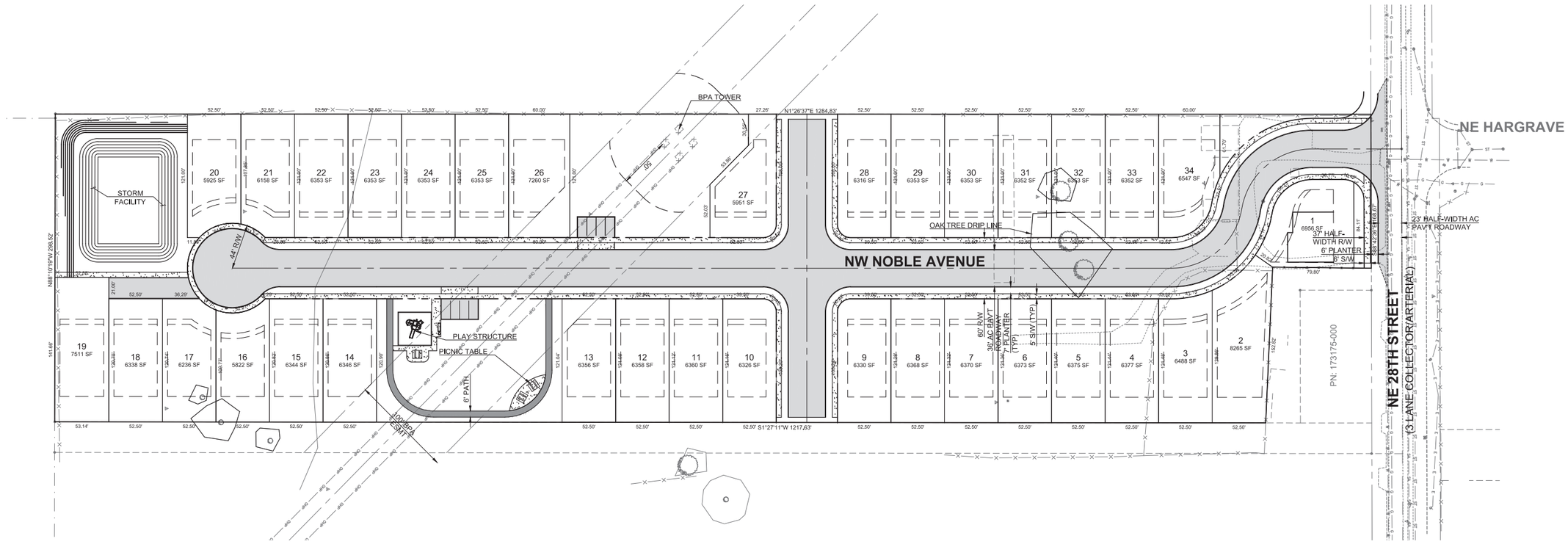
There is an existing well and septic system located on the site that will be removed/abandoned.



VICINITY MAP
NOT TO SCALE

Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Gravel	

Scale 1" = 50'
50 25 0 50



Conceptual Plat for:
Monte Verde Subdivision
A Subdivision Located in the City of Camas, Washington
Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

PLS ENGINEERING

Revisions

1	2	3	4	5	6

Project No. 3382	
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	JMT
DRAFTED BY:	JSV
REVIEWED BY:	TGJ

1
1

Exhibit 6 SUB22-05

Appendix B – Trip Generation and Distribution

Trip Generation

US Census Home/Work Data

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

Land Use:	Single-Family Detached Housing
Land Use Code:	210
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Trip Type:	Vehicle
Variable Quantity:	1

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

AM PEAK HOUR

Trip Rate: 0.7

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

PM PEAK HOUR

Trip Rate: 0.94

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	1	0	1

WEEKDAY

Trip Rate: 9.43

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	5	5	10

SATURDAY

Trip Rate: 9.48

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	5	5	10

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

Land Use:	Single-Family Detached Housing
Land Use Code:	210
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Trip Type:	Vehicle
Variable Quantity:	34

AM PEAK HOUR

Trip Rate: 0.7

	Enter	Exit	Total
Directional Split	26%	74%	
Trip Ends	6	18	24

PM PEAK HOUR

Trip Rate: 0.94

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	20	12	32

WEEKDAY

Trip Rate: 9.43

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	160	160	320

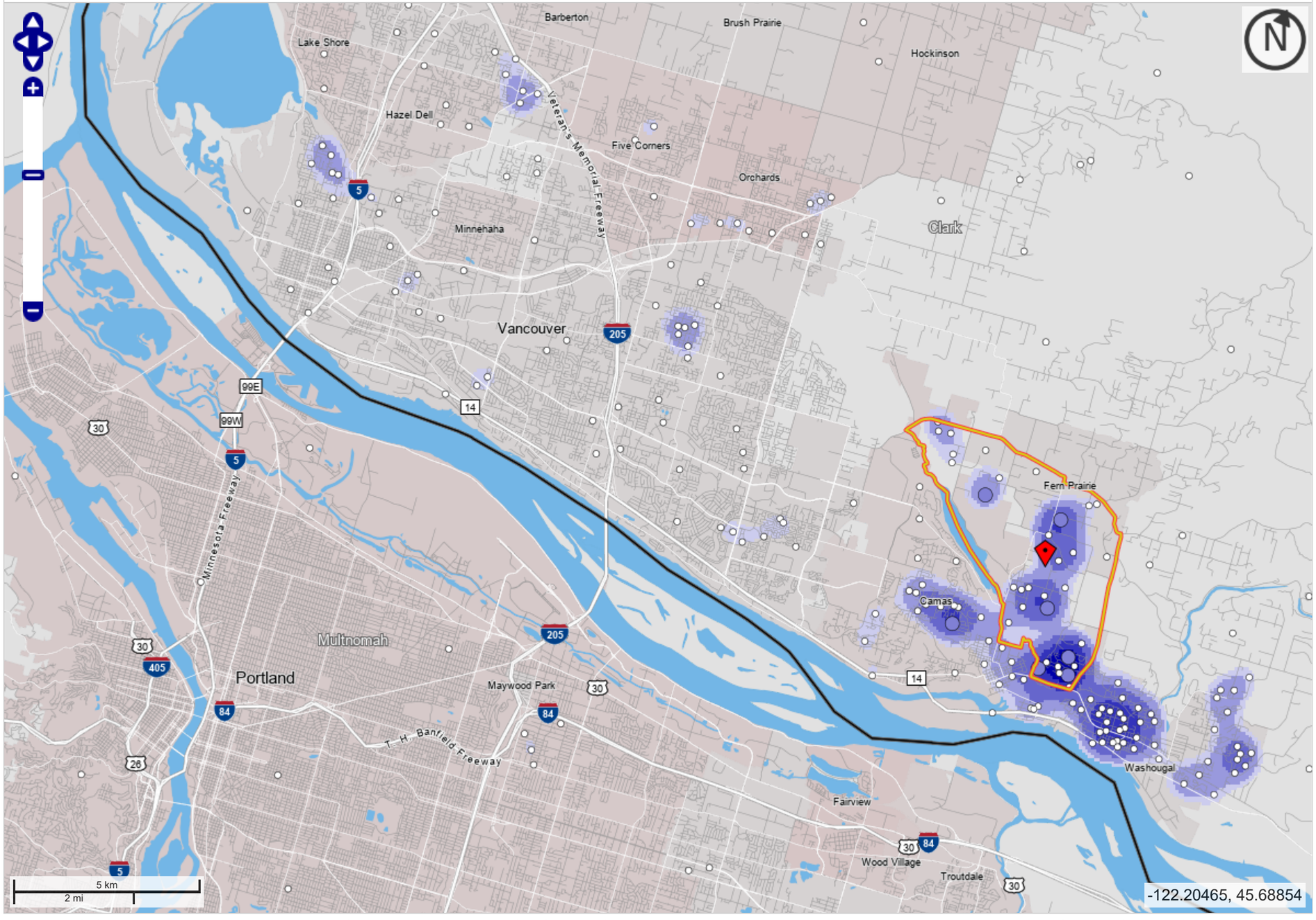
SATURDAY

Trip Rate: 9.48

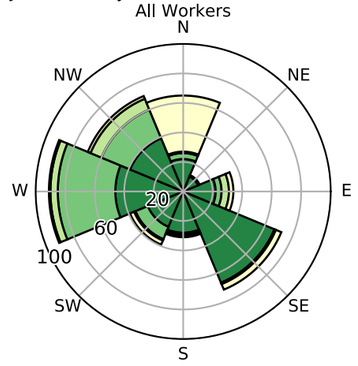
	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	161	161	322

OnTheMap

Save Load Feedback Previous Extent Show Tabs Hide Chart/Report



Job Counts by Distance/Direction in 2019
All Workers



View as Radial Chart

Jobs by Distance - Work Census Block to Home Census Block

	2019 Count	2019 Share
Total All Jobs	414	100.0%
Less than 10 miles	261	63.0%
10 to 24 miles	78	18.8%
25 to 50 miles	22	5.3%
Greater than 50 miles	53	12.8%

Appendix C – Traffic Volumes

Traffic Counts

In-Process Data

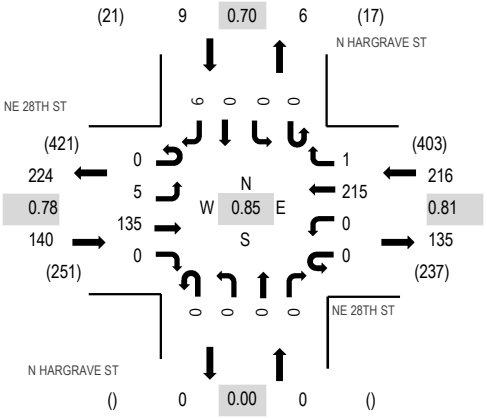
Location: 1 N HARGRAVE ST & NE 28TH ST AM

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

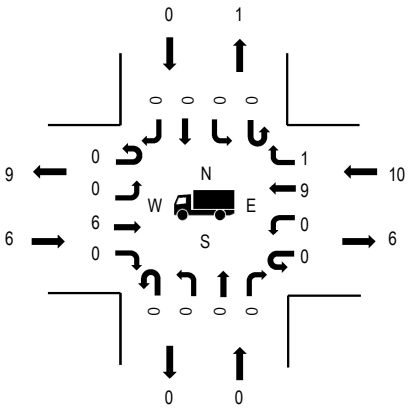
Location: 1 N HARGRAVE ST & NE 28TH ST AM
Date: Wednesday, June 29, 2022
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:45 AM - 09:00 AM

Peak Hour

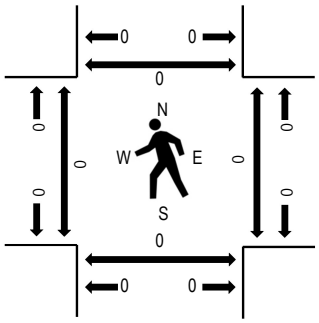
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	4.3%	0.78
WB	4.6%	0.81
NB	0.0%	0.00
SB	0.0%	0.70
All	4.4%	0.85

Traffic Counts - Motorized Vehicles

Interval Start Time	NE 28TH ST Eastbound				NE 28TH ST Westbound				N HARGRAVE ST Northbound				N HARGRAVE ST Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	2	5	0	0	0	13	0	0	0	0	0	0	0	0	0	20	310
7:05 AM	0	0	6	0	0	0	14	0	0	0	0	0	0	0	0	1	21	310
7:10 AM	0	1	13	0	0	0	15	0	0	0	0	0	0	0	0	0	29	314
7:15 AM	0	0	9	0	0	0	13	0	0	0	0	0	0	0	0	3	25	308
7:20 AM	0	0	10	0	0	0	12	0	0	0	0	0	0	0	0	1	23	316
7:25 AM	0	2	5	0	0	0	14	0	0	0	0	0	0	0	0	0	21	324
7:30 AM	0	0	8	0	0	0	18	0	0	0	0	0	0	1	0	1	28	335
7:35 AM	0	1	12	0	0	0	24	0	0	0	0	0	0	0	0	1	38	344
7:40 AM	0	1	7	0	0	0	24	0	0	0	0	0	0	0	0	1	33	341
7:45 AM	0	1	7	0	0	0	16	1	0	0	0	0	0	0	0	0	25	330
7:50 AM	0	2	7	0	0	0	16	0	0	0	0	0	0	0	0	3	28	335
7:55 AM	0	0	12	0	0	0	7	0	0	0	0	0	0	0	0	0	19	346
8:00 AM	0	0	10	0	0	0	9	1	0	0	0	0	0	0	0	0	20	365
8:05 AM	0	0	11	0	0	0	14	0	0	0	0	0	0	0	0	0	25	
8:10 AM	0	0	7	0	0	0	13	0	0	0	0	0	0	0	0	3	23	
8:15 AM	0	0	10	0	0	0	23	0	0	0	0	0	0	0	0	0	33	
8:20 AM	0	1	9	0	0	0	19	0	0	0	0	0	0	0	0	2	31	
8:25 AM	0	0	15	0	0	0	16	0	0	0	0	0	0	0	0	1	32	
8:30 AM	0	1	13	0	0	0	23	0	0	0	0	0	0	0	0	0	37	
8:35 AM	0	0	16	0	0	0	17	0	0	0	0	0	0	0	0	2	35	
8:40 AM	0	0	7	0	0	0	14	0	0	0	0	0	0	0	0	1	22	
8:45 AM	0	0	13	0	0	0	17	0	0	0	0	0	0	0	0	0	30	
8:50 AM	0	1	14	0	0	0	24	0	0	0	0	0	0	0	0	0	39	
8:55 AM	0	2	10	0	0	0	26	0	0	0	0	0	0	0	0	0	38	
Count Total	0	15	236	0	0	0	401	2	0	0	0	0	0	1	0	20	675	
Peak Hour	0	5	135	0	0	0	215	1	0	0	0	0	0	0	0	9	365	

Location: 1 N HARGRAVE ST & NE 28TH ST AM

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

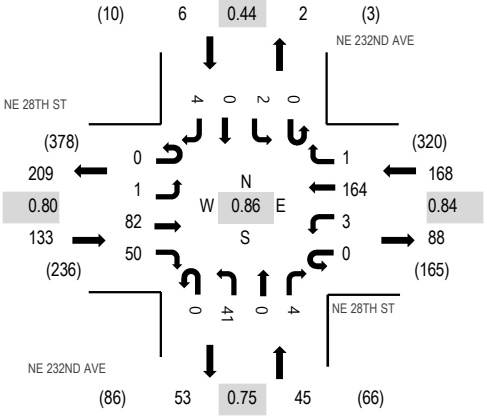
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	1	0	1	0	2	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	1	0	0	0	1	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	1	0	0	0	1	7:10 AM	0	0	1	0	1	7:10 AM	0	0	0	0	0
7:15 AM	1	0	0	0	1	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	1	0	0	0	1	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	0	0	0	1	1	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	2	0	0	0	2	7:35 AM	0	0	1	0	1	7:35 AM	0	0	0	0	0
7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	1	0	1	0	2	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	1	0	0	0	1	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	1	0	2	0	3	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	0	0	1	0	1	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	0	0	1	0	1	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	0	3	0	3	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	0	1	0	1	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	1	0	0	0	1	8:30 AM	1	0	0	0	1	8:30 AM	0	0	0	0	0
8:35 AM	2	0	0	0	2	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	1	0	0	0	1	8:45 AM	1	0	0	0	1	8:45 AM	0	0	0	0	0
8:50 AM	1	0	0	0	1	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	0	2	0	2	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	15	0	12	1	28	Count Total	2	0	2	0	4	Count Total	0	0	0	0	0
Peak Hour	6	0	10	0	16	Peak Hour	2	0	0	0	2	Peak Hour	0	0	0	0	0

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

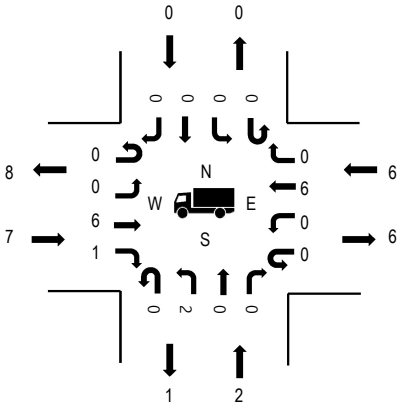
Location: 2 NE 232ND AVE & NE 28TH ST AM
Date: Wednesday, June 29, 2022
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:45 AM - 09:00 AM

Peak Hour

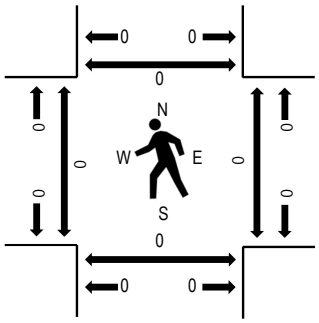
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	5.3%	0.80
WB	3.6%	0.84
NB	4.4%	0.75
SB	0.0%	0.44
All	4.3%	0.86

Traffic Counts - Motorized Vehicles

Interval Start Time	NE 28TH ST Eastbound				NE 28TH ST Westbound				NE 232ND AVE Northbound				NE 232ND AVE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	0	4	4	0	0	10	0	0	0	0	0	0	0	0	1	19	280
7:05 AM	0	0	7	1	0	1	13	0	0	1	0	1	0	0	0	0	24	281
7:10 AM	0	0	7	4	0	0	9	0	0	4	0	0	0	0	0	1	25	281
7:15 AM	0	0	7	1	0	0	11	0	0	2	0	0	0	0	0	0	21	281
7:20 AM	0	0	7	2	0	0	10	0	0	1	0	0	0	0	0	0	20	290
7:25 AM	0	0	7	1	0	1	12	0	0	1	0	0	0	0	0	0	22	301
7:30 AM	0	0	6	0	0	0	14	0	0	4	0	0	0	0	0	0	24	308
7:35 AM	0	0	8	5	0	1	19	1	0	1	0	0	0	0	0	1	36	318
7:40 AM	0	0	4	2	0	1	20	0	0	2	0	0	0	0	0	0	29	319
7:45 AM	0	0	6	2	0	0	12	0	0	1	0	0	0	0	0	0	21	310
7:50 AM	0	0	4	2	0	1	11	0	0	3	0	0	0	0	0	1	22	319
7:55 AM	0	0	9	3	0	1	4	0	0	0	0	0	0	0	0	0	17	337
8:00 AM	0	0	6	4	0	0	6	0	0	3	0	0	0	0	0	1	20	352
8:05 AM	0	0	8	2	0	0	12	1	0	1	0	0	0	0	0	0	24	
8:10 AM	0	0	7	2	0	1	7	0	0	5	0	0	0	1	0	2	25	
8:15 AM	0	0	7	0	0	0	21	0	0	1	0	0	0	1	0	0	30	
8:20 AM	0	0	5	7	0	0	15	0	0	4	0	0	0	0	0	0	31	
8:25 AM	0	0	8	3	0	0	14	0	0	3	0	1	0	0	0	0	29	
8:30 AM	0	0	8	5	0	1	18	0	0	2	0	0	0	0	0	0	34	
8:35 AM	0	0	11	7	0	0	15	0	0	4	0	0	0	0	0	0	37	
8:40 AM	0	0	2	4	0	0	7	0	0	5	0	2	0	0	0	0	20	
8:45 AM	0	0	6	5	0	0	15	0	0	3	0	1	0	0	0	0	30	
8:50 AM	0	1	8	7	0	1	20	0	0	3	0	0	0	0	0	0	40	
8:55 AM	0	0	6	4	0	0	14	0	0	7	0	0	0	0	0	1	32	
Count Total	0	1	158	77	0	9	309	2	0	61	0	5	0	2	0	8	632	
Peak Hour	0	1	82	50	0	3	164	1	0	41	0	4	0	2	0	4	352	

Location: 2 NE 232ND AVE & NE 28TH ST AM

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

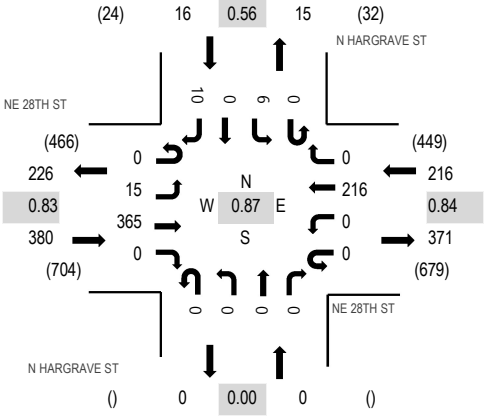
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	1	0	0	0	1	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	0	0	0	0	7:10 AM	0	0	1	0	1	7:10 AM	0	0	0	0	0
7:15 AM	1	0	0	0	1	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	1	0	0	0	1	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	2	0	0	0	2	7:30 AM	0	0	1	0	1	7:30 AM	0	0	0	0	0
7:35 AM	2	0	0	0	2	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	1	0	0	0	1	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	1	0	0	0	1	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	1	0	1	0	2	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	1	0	0	0	1	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	0	0	2	0	2	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	1	1	0	2	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	0	2	0	2	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	2	0	0	0	2	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	1	0	0	0	1	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	0	0	8:40 AM	0	1	0	0	1	8:40 AM	0	0	0	0	0
8:45 AM	2	0	0	0	2	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	0	1	0	0	1	8:50 AM	1	0	0	0	1	8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	16	2	6	0	24	Count Total	1	1	2	0	4	Count Total	0	0	0	0	0
Peak Hour	7	2	6	0	15	Peak Hour	1	1	0	0	2	Peak Hour	0	0	0	0	0

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

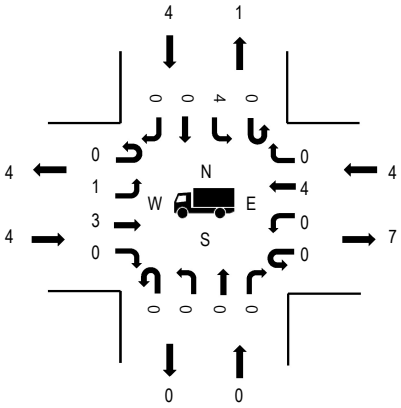
Location: 1 N HARGRAVE ST & NE 28TH ST PM
Date: Wednesday, June 29, 2022
Peak Hour: 05:00 PM - 06:00 PM
Peak 15-Minutes: 05:20 PM - 05:35 PM

Peak Hour

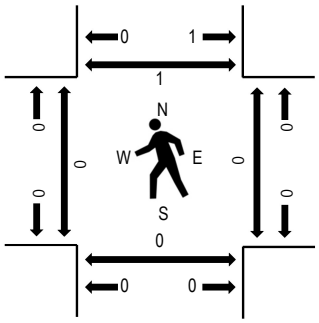
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.1%	0.83
WB	1.9%	0.84
NB	0.0%	0.00
SB	25.0%	0.56
All	2.0%	0.87

Traffic Counts - Motorized Vehicles

Interval Start Time	NE 28TH ST Eastbound				NE 28TH ST Westbound				N HARGRAVE ST Northbound				N HARGRAVE ST Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	1	30	0	0	0	21	0	0	0	0	0	0	0	0	1	53	565
4:05 PM	0	0	28	0	0	0	22	0	0	0	0	0	0	0	0	0	50	560
4:10 PM	0	1	22	0	0	0	21	0	0	0	0	0	0	0	0	0	44	557
4:15 PM	0	2	30	0	0	0	25	0	0	0	0	0	0	0	0	0	57	558
4:20 PM	0	2	16	0	0	0	23	0	0	0	0	0	0	0	0	0	41	549
4:25 PM	0	2	31	0	0	0	15	0	0	0	0	0	0	0	0	1	49	571
4:30 PM	0	2	19	0	0	0	19	0	0	0	0	0	0	0	0	0	40	586
4:35 PM	0	1	24	0	0	0	10	0	0	0	0	0	0	0	0	2	37	595
4:40 PM	0	0	24	0	0	0	20	0	0	0	0	0	0	0	0	1	45	607
4:45 PM	0	1	24	0	0	0	31	0	0	0	0	0	0	0	0	1	57	605
4:50 PM	0	3	38	0	0	0	13	0	0	0	0	0	0	0	0	0	54	597
4:55 PM	0	2	21	0	0	0	13	0	0	0	0	0	0	1	0	1	38	604
5:00 PM	0	1	27	0	0	0	15	0	0	0	0	0	0	2	0	3	48	612
5:05 PM	0	1	31	0	0	0	14	0	0	0	0	0	0	1	0	0	47	
5:10 PM	0	1	26	0	0	0	16	0	0	0	0	0	0	0	0	2	45	
5:15 PM	0	1	24	0	0	0	22	0	0	0	0	0	0	0	0	1	48	
5:20 PM	0	0	37	0	0	0	24	0	0	0	0	0	0	1	0	1	63	
5:25 PM	0	1	40	0	0	0	22	0	0	0	0	0	0	0	0	1	64	
5:30 PM	0	2	35	0	0	0	12	0	0	0	0	0	0	0	0	0	49	
5:35 PM	0	2	34	0	0	0	13	0	0	0	0	0	0	0	0	0	49	
5:40 PM	0	0	25	0	0	0	17	0	0	0	0	0	0	1	0	0	43	
5:45 PM	0	2	29	0	0	0	18	0	0	0	0	0	0	0	0	0	49	
5:50 PM	0	2	37	0	0	0	21	0	0	0	0	0	0	1	0	0	61	
5:55 PM	0	2	20	0	0	0	22	0	0	0	0	0	0	0	0	2	46	
Count Total	0	32	672	0	0	0	449	0	0	0	0	0	0	7	0	17	1,177	
Peak Hour	0	15	365	0	0	0	216	0	0	0	0	0	0	6	0	10	612	

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

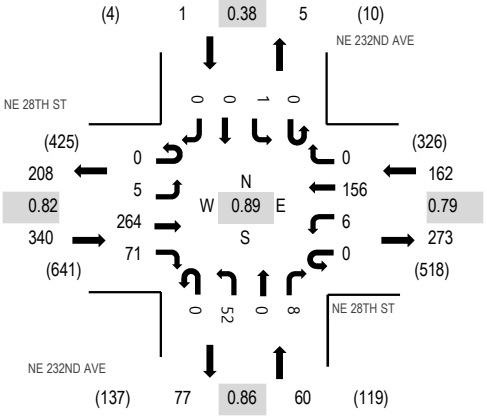
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	0	0	0	1	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	1	0	1	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	1	0	1	0	2	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	1	1
4:25 PM	1	0	0	0	1	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	0	1	0	2	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	1	0	1	4:40 PM	0	0	0	0	0	4:40 PM	0	0	2	0	2
4:45 PM	1	0	0	0	1	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	1	1	5:00 PM	0	0	1	0	1	5:00 PM	0	0	0	0	0
5:05 PM	0	0	2	0	2	5:05 PM	0	0	1	0	1	5:05 PM	0	0	0	0	0
5:10 PM	0	0	1	0	1	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	1	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	1	0	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	1	0	0	0	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	1	0	0	0	1	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	3	3
5:40 PM	2	0	0	1	3	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	1	1	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	1	0	1	5:55 PM	0	0	0	0	0
Count Total	9	0	8	4	21	Count Total	0	0	3	0	3	Count Total	0	0	2	4	6
Peak Hour	4	0	4	4	12	Peak Hour	0	0	3	0	3	Peak Hour	0	0	0	3	3

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

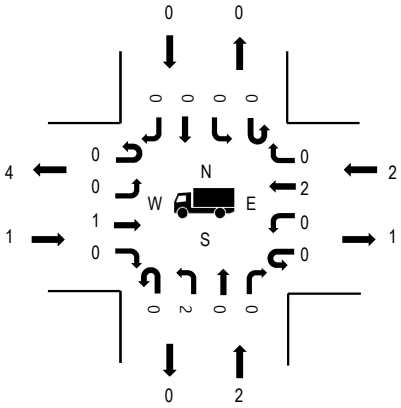
Location: 2 NE 232ND AVE & NE 28TH ST PM
Date: Wednesday, June 29, 2022
Peak Hour: 04:40 PM - 05:40 PM
Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour

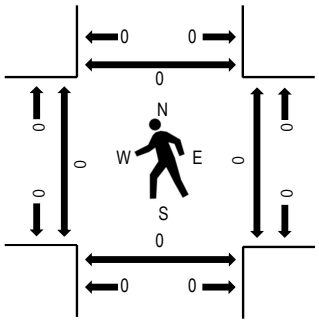
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.3%	0.82
WB	1.2%	0.79
NB	3.3%	0.86
SB	0.0%	0.38
All	0.9%	0.89

Traffic Counts - Motorized Vehicles

Interval Start Time	NE 28TH ST Eastbound				NE 28TH ST Westbound				NE 232ND AVE Northbound				NE 232ND AVE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	21	4	0	1	13	0	0	4	0	0	0	0	0	0	43	537
4:05 PM	0	0	31	2	0	0	14	0	0	8	0	0	0	0	0	0	55	531
4:10 PM	0	0	20	3	0	0	10	0	0	3	0	0	0	0	0	0	36	522
4:15 PM	0	0	22	4	0	0	17	0	0	7	0	0	0	0	0	1	51	526
4:20 PM	0	0	12	5	0	0	20	1	0	3	0	0	0	0	0	0	41	518
4:25 PM	0	1	23	2	0	0	7	0	0	6	0	3	0	0	0	0	42	531
4:30 PM	0	1	20	2	0	0	13	0	0	4	0	0	0	0	0	1	41	551
4:35 PM	0	0	17	6	0	0	10	0	0	4	0	1	0	0	0	0	38	550
4:40 PM	0	0	22	4	0	0	15	0	0	3	0	0	0	1	0	0	45	563
4:45 PM	0	0	17	5	0	2	27	0	0	5	0	1	0	0	0	0	57	560
4:50 PM	0	1	27	7	0	0	7	0	0	2	0	2	0	0	0	0	46	548
4:55 PM	0	1	18	4	0	1	12	0	0	6	0	0	0	0	0	0	42	558
5:00 PM	0	0	20	2	0	0	11	0	0	3	0	1	0	0	0	0	37	553
5:05 PM	0	0	27	3	0	2	9	0	0	4	0	1	0	0	0	0	46	
5:10 PM	0	0	17	9	0	0	10	0	0	4	0	0	0	0	0	0	40	
5:15 PM	0	0	16	5	0	0	16	0	0	6	0	0	0	0	0	0	43	
5:20 PM	0	1	19	9	0	0	16	0	0	7	0	2	0	0	0	0	54	
5:25 PM	0	0	33	9	0	0	14	0	0	6	0	0	0	0	0	0	62	
5:30 PM	0	1	25	4	0	0	8	0	0	2	0	0	0	0	0	0	40	
5:35 PM	0	1	23	10	0	1	11	0	0	4	0	1	0	0	0	0	51	
5:40 PM	0	0	18	6	0	0	14	0	0	3	0	1	0	0	0	0	42	
5:45 PM	0	0	17	14	0	0	11	0	0	2	0	1	0	0	0	0	45	
5:50 PM	0	2	23	6	0	0	17	0	0	7	0	0	0	0	0	1	56	
5:55 PM	0	0	15	4	0	1	15	0	0	2	0	0	0	0	0	0	37	
Count Total	0	9	503	129	0	8	317	1	0	105	0	14	0	1	0	3	1,090	
Peak Hour	0	5	264	71	0	6	156	0	0	52	0	8	0	1	0	0	563	

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

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

Type of report: Tube Count - Volume Data

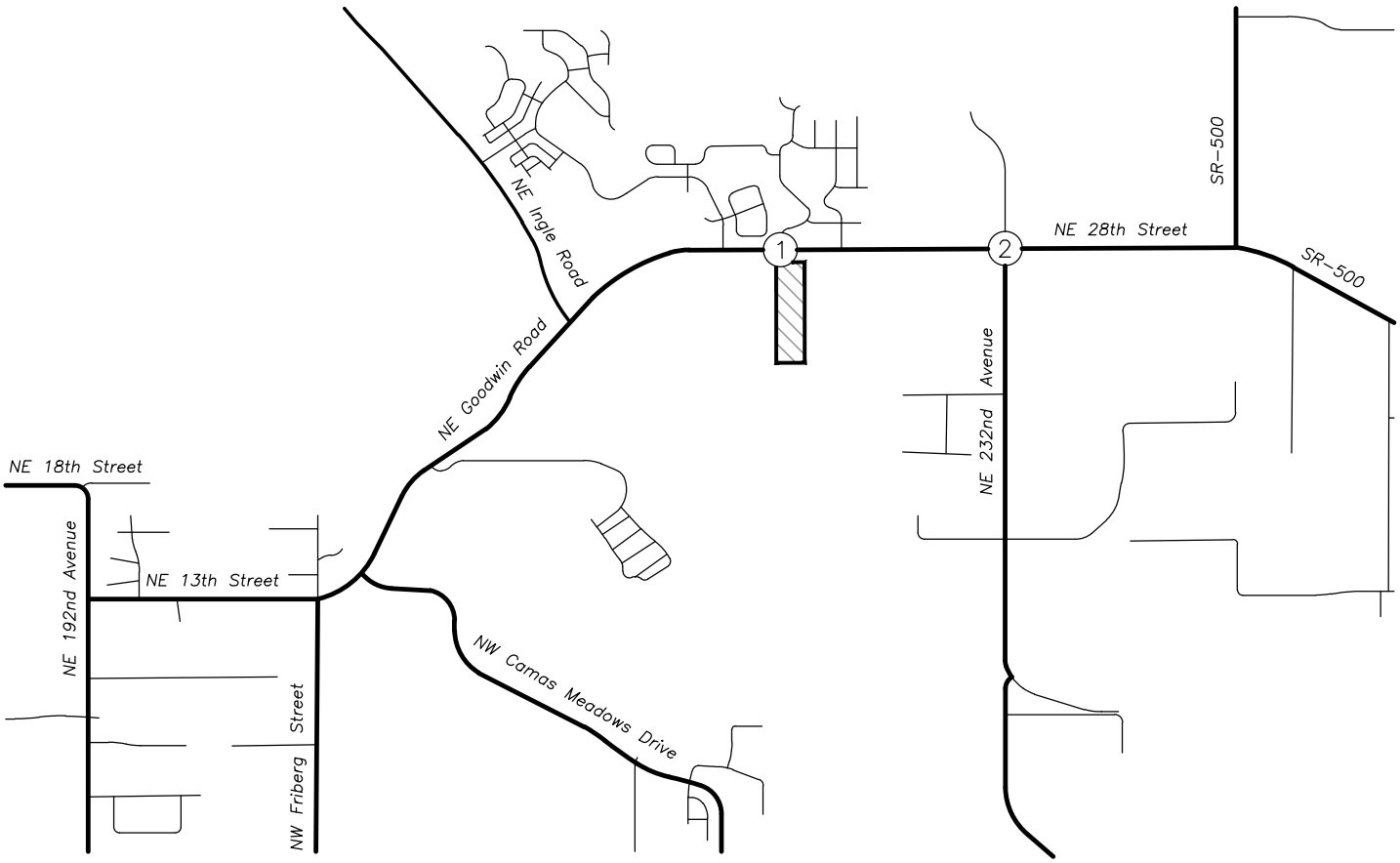
LOCATION: SC01316 - NE 28th St W of NE 232nd Ave
QC JOB #: 150604172
SPECIFIC LOCATION:
DIRECTION: EB, WB
CITY/STATE: Clark, WA
DATE: Sep 24 2019 - Sep 24 2019

Start Time	Mon	Tue 24 Sep 19	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM		18				18			18	
01:00 AM		17				17			17	
02:00 AM		15				15			15	
03:00 AM		18				18			18	
04:00 AM		47				47			47	
05:00 AM		115				115			115	
06:00 AM		251				251			251	
07:00 AM		414				414			414	
08:00 AM		**472**				**472**			**472**	
09:00 AM		329				329			329	
10:00 AM		313				313			313	
11:00 AM		312				312			312	
12:00 PM		353				353			353	
01:00 PM		355				355			355	
02:00 PM		411				411			411	
03:00 PM		576				576			576	
04:00 PM		509				509			509	
05:00 PM		**586**				**586**			**586**	
06:00 PM		526				526			526	
07:00 PM		366				366			366	
08:00 PM		267				267			267	
09:00 PM		148				148			148	
10:00 PM		69				69			69	
11:00 PM		44				44			44	
Day Total		6531				6531			6531	
% Weekday Average		100%								
% Week Average		100%				100%				
AM Peak Volume		8:00 AM 472				8:00 AM 472			8:00 AM 472	
PM Peak Volume		5:00 PM 586				5:00 PM 586			5:00 PM 586	

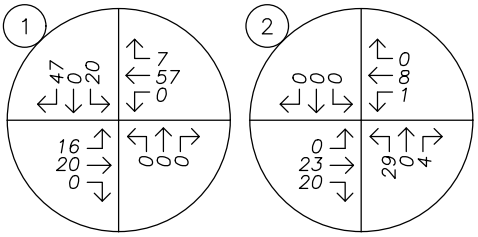
Comments:

Report generated on 10/3/2019 7:35 PM

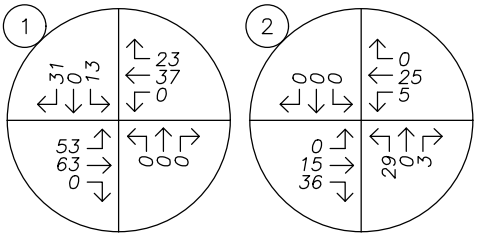
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)



AM PEAK HOUR



PM PEAK HOUR



no scale

lancaster mobley

TRAFFIC VOLUMES
In-Process Development Trips
AM & PM Peak Hours

Figure A
Monte Verde Subdivision
7/11/2022

Appendix D – Safety Analysis

Crash History Data

Left-turn Lane Warrant Analysis

All-Way Stop-Control Warrant Analysis

Traffic Signal Warrant Analysis

OFFICER REPORTED CRASHES THAT OCCURRED AT THE FOLLOWING INTERSECTIONS IN THE CITY OF CAMAS & CLARK COUNTY

222ND AVE / HARGRAVE ST @ 28TH ST

01/01/2017 - 12/31/2021

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

JURISDICTION	COUNTY	CITY	PRIMARY TRAFFICWAY	MILEPOST	A / B	BLOCK NUMBER	INTERSECTING TRAFFICWAY	CO ONLY Intersecting County Road MP	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	SR ONLY HISTORY/ SUSPENSE	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FAT	# VEH	# PEDS	# BIKES	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	Clark	Camas	NE 28TH ST			22100			166	F	W	NE 222ND AVE	No	E711830	09/14/2017	19:12	Possible Injury	1	0	2	0	0	Passenger Car	Passenger Car	At Driveway	Clear or Partly Cloudy	Dry	Dusk	From same direction - both going straight - one stopped - rear-end

OFFICER REPORTED CRASHES THAT OCCURRED AT THE FOLLOWING INTERSECTIONS IN THE CITY OF CAMAS & CLARK COUNTY

222ND AVE / HARGRAVE ST @ 28TH ST

01/01/2017 - 12/31/2021

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

VEHICLE 1 ACTION	VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM	VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD
Going Straight Ahead	Stopped in Roadway	East	West	Vehicle Stopped	Vehicle Stopped	Operating Defective Equipment	Inattention		None									Lane of Primary Trafficway	1142797.53	119144.89

OFFICER REPORTED CRASHES THAT OCCURRED AT THE FOLLOWING INTERSECTIONS IN THE CITY OF CAMAS & CLARK COUNTY

232ND AVE (CO RD #30950, MP 2.870 - 2.890) @ 28TH ST (CO RD #93350, MP 3.070 - 3.110)

01/01/2017 - 12/31/2021

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

JURISDICTION	COUNTY	CITY	PRIMARY TRAFFICWAY	MILEPOST	A / B	BLOCK NUMBER	INTERSECTING TRAFFICWAY	CO ONLY Intersecting County Road MP	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	SR ONLY HISTORY/ SUSPENSE	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FAT	# VEH	# PEDS	# BIKES	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK
County Road	Clark		93350	3.090			30950	2.890					No	EB69640	09/01/2021	11:59	No Apparent Injury	0	0	1	0	0	Pickup,Panel Truck or Vanette under 10,000 lb		At Intersection and Related	Clear	Dry	Daylight	Utility Pole
County Road	Clark		93350	3.090			30950	2.890					No	EA02765	12/20/2019	09:12	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Raining	Wet	Daylight	From same direction - one left turn - one straight
County Road	Clark		93350	3.090			30950	2.890					No	E681299	06/11/2017	15:58	Possible Injury	2	0	3	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	Intersection Related but Not at Intersection	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
County Road	Clark		93350	3.090			30950	2.890					No	EB10619	02/28/2021	16:35	No Apparent Injury	0	0	1	0	1	Pickup,Panel Truck or Vanette under 10,000 lb		At Intersection and Related	Clear	Dry	Daylight	Vehicle Strikes Pedalcyclist
County Road	Clark		93350	3.090			30950	2.890					No	EB42601	06/15/2021	18:31	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Raining	Wet	Daylight	Entering at angle
County Road	Clark		93350	3.090			30950	2.890					No	E923671	05/23/2019	16:54	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - one left turn - one straight
County Road	Clark		93350	3.090			30950	2.890					No	EB53840	07/20/2021	15:10	Suspected Minor Injury	3	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear	Dry	Daylight	Entering at angle
County Road	Clark		93350	3.090									No	EA84265	11/24/2020	15:25	Possible Injury	2	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	Driveway Related but Not at Driveway	Overcast	Dry	Daylight	From same direction - both going straight - one stopped - rear-end

OFFICER REPORTED CRASHES THAT OCCURRED AT THE FOLLOWING INTERSECTIONS IN THE CITY OF CAMAS & CLARK COUNTY

232ND AVE (CO RD #30950, MP 2.870 - 2.890) @ 28TH ST (CO RD #93350, MP 3.070 - 3.110)

01/01/2017 - 12/31/2021

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

VEHICLE 1 ACTION	VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM	VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD
Going Straight Ahead		East	West			Other Contributing Circ Not Listed												Past the Outside Shoulder of Primary Trafficway	1145581.94	119082.99
Going Straight Ahead	Making Left Turn	East	West	East	South	Follow Too Closely			None									Lane of Primary Trafficway	1145581.43	119082.28
Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped	Inattention			None									Lane of Primary Trafficway	1145655.84	119081.2
Going Straight Ahead		East	West			None									Improper Turn/Merge			Lane of Primary Trafficway	1145581.94	119082.99
Making Right Turn	Stopped at Signal or Stop Sign	West	South	South	West	Exceeding Reas. Safe Speed			None									Intersecting Trafficway	1145581.94	119082.99
Going Straight Ahead	Making Left Turn	East	West	East	South	Inattention	Follow Too Closely		None									Lane of Primary Trafficway	1145581.43	119082.29
Making Left Turn	Going Straight Ahead	South	West	East	West	Did Not Grant RW to Vehicle	Unknown Distraction		None									Lane of Primary Trafficway	1145581.94	119082.99
Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped	Follow Too Closely			None									Lane of Primary Trafficway	1145581.94	119082.99

Left-Turn Lane Warrant Analysis

Project: Monte Verde Subdivision
Intersection: 2. NE 232nd Avenue at NE 28th Street
Date: 7/11/2022
Scenario: 2024 Buildout - AM Peak Hour (EB)

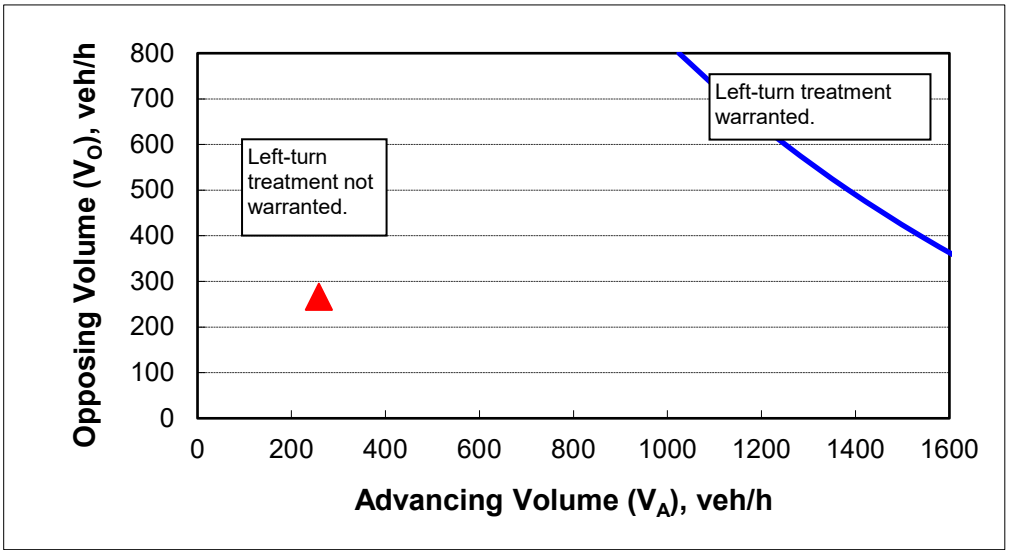
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	50
Percent of left-turns in advancing volume (V_A), %:	0%
Advancing volume (V_A), veh/h:	258
Opposing volume (V_O), veh/h:	266

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1778
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

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

Left-Turn Lane Warrant Analysis

Project: Monte Verde Subdivision
Intersection: 2. NE 232nd Avenue at NE 28th Street
Date: 7/11/2022
Scenario: 2024 Buildout - AM Peak Hour (WB)

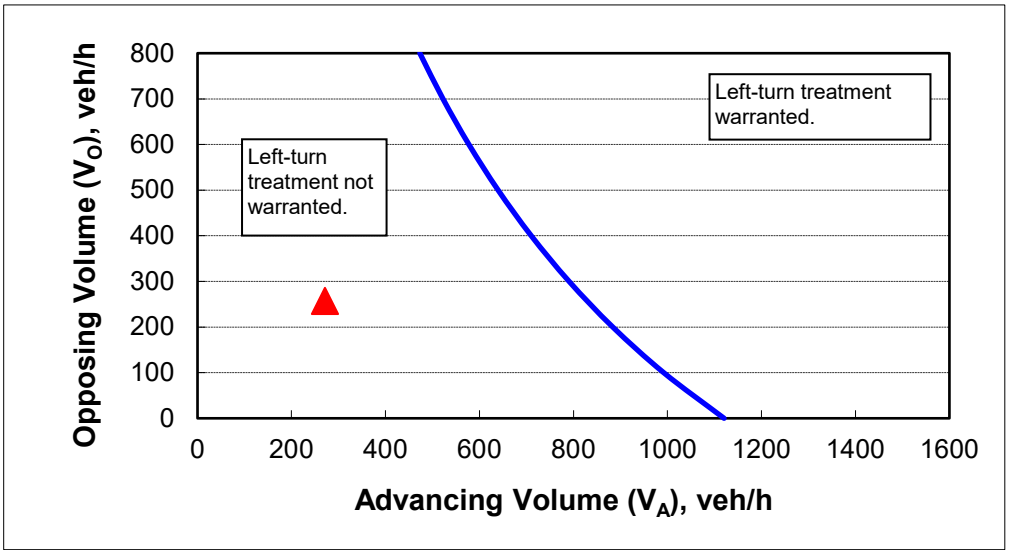
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	50
Percent of left-turns in advancing volume (V_A), %:	2%
Advancing volume (V_A), veh/h:	271
Opposing volume (V_O), veh/h:	257

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	829
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

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

Left-Turn Lane Warrant Analysis

Project: Monte Verde Subdivision
Intersection: 2. NE 232nd Avenue at NE 28th Street
Date: 7/11/2022
Scenario: 2024 Buildout - PM Peak Hour (EB)

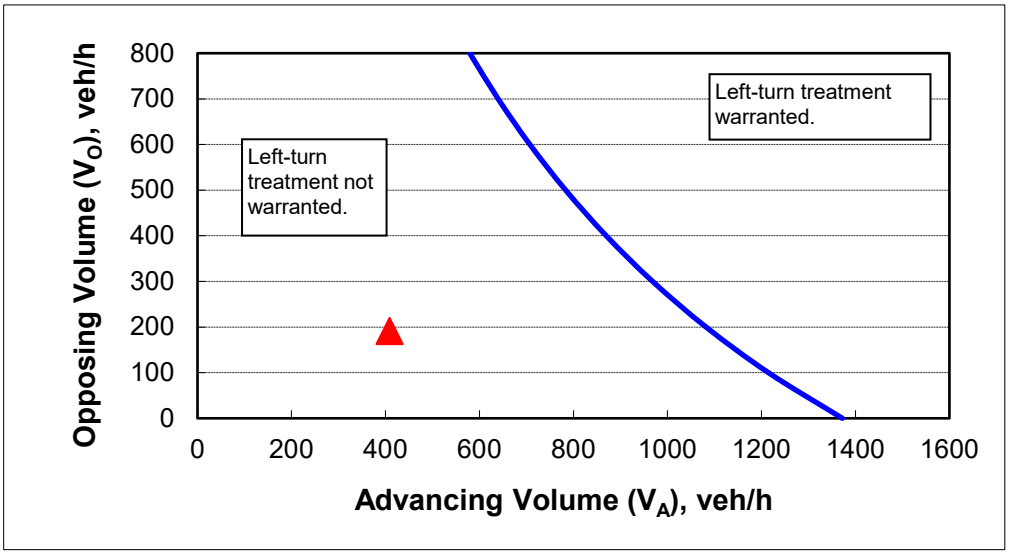
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	50
Percent of left-turns in advancing volume (V_A), %:	1%
Advancing volume (V_A), veh/h:	409
Opposing volume (V_O), veh/h:	191

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1093
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

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

Left-Turn Lane Warrant Analysis

Project: Monte Verde Subdivision
Intersection: 2. NE 232nd Avenue at NE 28th Street
Date: 7/11/2022
Scenario: 2024 Buildout - PM Peak Hour (WB)

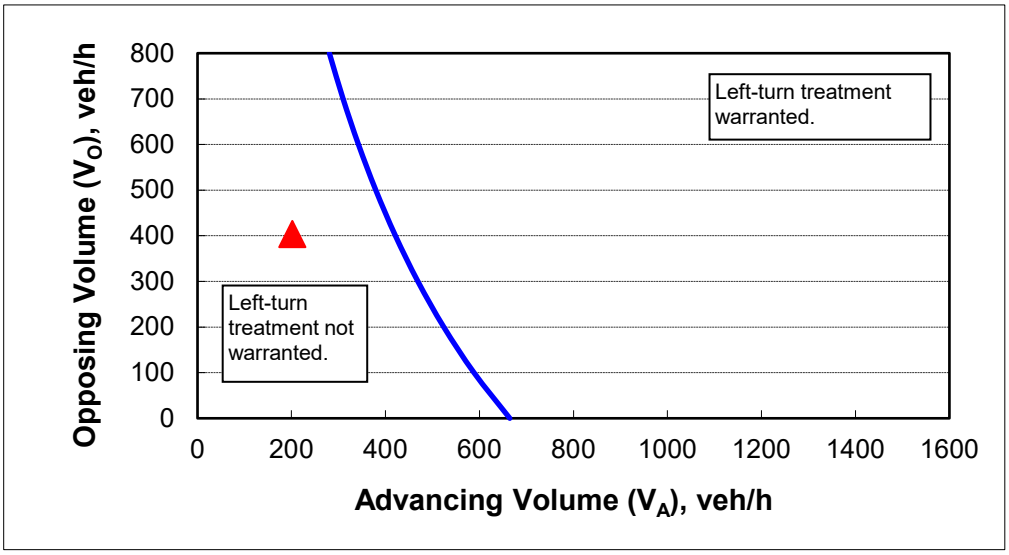
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	50
Percent of left-turns in advancing volume (V_A), %:	5%
Advancing volume (V_A), veh/h:	202
Opposing volume (V_O), veh/h:	404

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	419
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

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

Multi-Way Stop Warrant Analysis

Project: Monte Verde Subdivision
Date: 7/11/2022
Scenario: Year 2024 Buildout Conditions

Major Street:	NE 28th Street	Minor Street:	NE Hargrave Street
PM Peak Hour Volumes:	816	PM Peak Hour Volumes:	78

Warrant Used:

X 100 percent of standard warrants used

_____ 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph.

ADT on Major St. (total of both approaches)		ADT on Minor St. (total of both approaches)	
100% Warrants	70% Warrants	100% Warrants	70% Warrants
5,310	3,717	3,540	2,478

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

	Approach Volumes	Minimum Volumes	Is Multi-Way Stop Warrant Met?
Section 2B.07.C			
Major Street	8,160	5,310	
Minor Street	780	3,540	**No**

Note: Minor Street includes the total of vehicular, pedestrian, and bicycle traffic.

Multi-Way Stop Warrant Analysis

Project: Monte Verde Subdivision
Date: 7/11/2022
Scenario: Year 2024 Buildout Conditions

Major Street:	NE 28th Street	Minor Street:	NE 232nd Avenue
PM Peak Hour Volumes:	611	PM Peak Hour Volumes:	101

Warrant Used:

_____	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph.

ADT on Major St. (total of both approaches)		ADT on Minor St. (total of both approaches)	
100% Warrants	70% Warrants	100% Warrants	70% Warrants
5,310	3,717	3,540	2,478

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

	Approach Volumes	Minimum Volumes	Is Multi-Way Stop Warrant Met?
Section 2B.07.C			
Major Street	6,110	3,717	
Minor Street	1,010	2,478	**No**

Note: Minor Street includes the total of vehicular, pedestrian, and bicycle traffic.

Traffic Signal Warrant Analysis

Project: Monte Verde Subdivision
Date: 7/11/2022
Scenario: 2024 Buildout Conditions

Major Street:	NE 28th Street	Minor Street:	N Hargrave Street
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	816	PM Peak Hour Volumes:	50

Warrant Used:

X — 100 percent of standard warrants used

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

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

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

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	8,160	8,850	
Minor Street*	500	2,650	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	8,160	13,300	
Minor Street*	500	1,350	**No**
Combination Warrant			
Major Street	8,160	10,640	
Minor Street*	500	2,120	**No**

Note: Minor street right-turning traffic volumes reduced by 25%.

Traffic Signal Warrant Analysis

Project: Monte Verde Subdivision
Date: 7/11/2022
Scenario: 2024 Buildout Conditions

	Major Street:	Minor Street:
	NE 28th Street	NE 232nd Avenue
Number of Lanes:	1	1
PM Peak Hour Volumes:	611	95

Warrant Used:

X — 100 percent of standard warrants used

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

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

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

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	6,110	8,850	
Minor Street*	950	2,650	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	6,110	13,300	
Minor Street*	950	1,350	**No**
Combination Warrant			
Major Street	6,110	10,640	
Minor Street*	950	2,120	**No**

Note: Minor street right-turning traffic volumes reduced by 25%.

Appendix E – Operation Analysis

Level of Service Descriptions

Capacity Reports

Queuing Reports

LEVEL OF SERVICE

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

Level of service A: Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.

Level of service B: Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.

Level of service C: Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.

Level of service D: Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.

Level of service E: Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.

Level of service F: Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50

HCM 6th TWSC
1: N Hargrave Street & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	202	0	0	322	1	0	0	0	0	0	13
Future Vol, veh/h	7	202	0	0	322	1	0	0	0	0	0	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	4	4	4	5	5	5	2	2	2	0	0	0
Mvmt Flow	8	238	0	0	379	1	0	0	0	0	0	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	380	0	0	238	0	0	641	634	238	634	634	380
Stage 1	-	-	-	-	-	-	254	254	-	380	380	-
Stage 2	-	-	-	-	-	-	387	380	-	254	254	-
Critical Hdwy	4.14	-	-	4.15	-	-	7.12	6.52	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.236	-	-	2.245	-	-	3.518	4.018	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	1168	-	-	1311	-	-	388	397	801	395	399	671
Stage 1	-	-	-	-	-	-	750	697	-	646	617	-
Stage 2	-	-	-	-	-	-	637	614	-	755	701	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1168	-	-	1311	-	-	377	394	801	393	396	671
Mov Cap-2 Maneuver	-	-	-	-	-	-	537	529	-	556	536	-
Stage 1	-	-	-	-	-	-	745	692	-	641	617	-
Stage 2	-	-	-	-	-	-	622	614	-	750	696	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0	0	10.5
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1168	-	-	1311	-	-	671
HCM Lane V/C Ratio	-	0.007	-	-	-	-	-	0.023
HCM Control Delay (s)	0	8.1	-	-	0	-	-	10.5
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.1

HCM 6th TWSC
2: NE 232nd Avenue & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	123	75	4	246	1	61	0	6	3	0	6
Future Vol, veh/h	1	123	75	4	246	1	61	0	6	3	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	4	4	4	4	4	4	0	0	0
Mvmt Flow	1	143	87	5	286	1	71	0	7	3	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	287	0	0	230	0	0	489	486	187	489	529	287
Stage 1	-	-	-	-	-	-	189	189	-	297	297	-
Stage 2	-	-	-	-	-	-	300	297	-	192	232	-
Critical Hdwy	4.15	-	-	4.14	-	-	7.14	6.54	6.24	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.236	-	-	3.536	4.036	3.336	3.5	4	3.3
Pot Cap-1 Maneuver	1258	-	-	1326	-	-	486	478	850	493	458	757
Stage 1	-	-	-	-	-	-	808	740	-	716	671	-
Stage 2	-	-	-	-	-	-	705	664	-	814	716	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1258	-	-	1326	-	-	480	476	850	487	456	757
Mov Cap-2 Maneuver	-	-	-	-	-	-	480	476	-	487	456	-
Stage 1	-	-	-	-	-	-	807	739	-	715	668	-
Stage 2	-	-	-	-	-	-	696	661	-	807	715	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	13.5	10.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	499	1258	-	-	1326	-	-	639
HCM Lane V/C Ratio	0.156	0.001	-	-	0.004	-	-	0.016
HCM Control Delay (s)	13.5	7.9	0	-	7.7	0	-	10.7
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.1

HCM 6th TWSC
1: N Hargrave Street & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	365	0	0	216	0	0	0	0	6	0	10
Future Vol, veh/h	15	365	0	0	216	0	0	0	0	6	0	10
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	1	1	1	2	2	2	2	2	2	25	25	25
Mvmt Flow	17	420	0	0	248	0	0	0	0	7	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	249	0	0	420	0	0	708	703	420	703	703	249
Stage 1	-	-	-	-	-	-	454	454	-	249	249	-
Stage 2	-	-	-	-	-	-	254	249	-	454	454	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.12	6.52	6.22	7.35	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.35	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.35	5.75	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.518	4.018	3.318	3.725	4.225	3.525
Pot Cap-1 Maneuver	1323	-	-	1139	-	-	350	362	633	324	335	737
Stage 1	-	-	-	-	-	-	586	569	-	707	660	-
Stage 2	-	-	-	-	-	-	750	701	-	544	532	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1322	-	-	1139	-	-	341	357	633	320	330	736
Mov Cap-2 Maneuver	-	-	-	-	-	-	505	495	-	474	465	-
Stage 1	-	-	-	-	-	-	578	562	-	697	659	-
Stage 2	-	-	-	-	-	-	738	700	-	537	525	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0	0	11.1
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1322	-	-	1139	-	-	610
HCM Lane V/C Ratio	-	0.013	-	-	-	-	-	0.03
HCM Control Delay (s)	0	7.8	-	-	0	-	-	11.1
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.1

HCM 6th TWSC
2: NE 232nd Avenue & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	5	264	71	6	156	0	52	0	8	1	0	0
Future Vol, veh/h	5	264	71	6	156	0	52	0	8	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	1	1	1	3	3	3	0	0	0
Mvmt Flow	6	297	80	7	175	0	58	0	9	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	175	0	0	377	0	0	538	538	337	543	578	175
Stage 1	-	-	-	-	-	-	349	349	-	189	189	-
Stage 2	-	-	-	-	-	-	189	189	-	354	389	-
Critical Hdwy	4.1	-	-	4.11	-	-	7.13	6.53	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.209	-	-	3.527	4.027	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1414	-	-	1187	-	-	452	448	703	454	430	874
Stage 1	-	-	-	-	-	-	665	632	-	817	748	-
Stage 2	-	-	-	-	-	-	810	742	-	667	612	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1414	-	-	1187	-	-	448	443	703	444	425	874
Mov Cap-2 Maneuver	-	-	-	-	-	-	448	443	-	444	425	-
Stage 1	-	-	-	-	-	-	662	629	-	813	743	-
Stage 2	-	-	-	-	-	-	804	737	-	655	609	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	13.9	13.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	471	1414	-	-	1187	-	-	444
HCM Lane V/C Ratio	0.143	0.004	-	-	0.006	-	-	0.003
HCM Control Delay (s)	13.9	7.6	0	-	8.1	0	-	13.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0

HCM 6th TWSC
1: N Hargrave Street & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	230	0	0	392	8	0	0	0	20	0	61
Future Vol, veh/h	23	230	0	0	392	8	0	0	0	20	0	61
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	4	4	4	5	5	5	2	2	2	0	0	0
Mvmt Flow	27	271	0	0	461	9	0	0	0	24	0	72

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	470	0	0	271	0	0	827	795	271	791	791	466
Stage 1	-	-	-	-	-	-	325	325	-	466	466	-
Stage 2	-	-	-	-	-	-	502	470	-	325	325	-
Critical Hdwy	4.14	-	-	4.15	-	-	7.12	6.52	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.236	-	-	2.245	-	-	3.518	4.018	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	1081	-	-	1275	-	-	291	320	768	310	324	601
Stage 1	-	-	-	-	-	-	687	649	-	581	566	-
Stage 2	-	-	-	-	-	-	552	560	-	692	653	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1081	-	-	1275	-	-	251	312	768	304	316	601
Mov Cap-2 Maneuver	-	-	-	-	-	-	408	460	-	481	477	-
Stage 1	-	-	-	-	-	-	670	633	-	566	566	-
Stage 2	-	-	-	-	-	-	486	560	-	675	637	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0	0	12.6
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1081	-	-	1275	-	-	566
HCM Lane V/C Ratio	-	0.025	-	-	-	-	-	0.168
HCM Control Delay (s)	0	8.4	-	-	0	-	-	12.6
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.6

HCM 6th TWSC
2: NE 232nd Avenue & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	151	98	5	264	1	92	0	10	3	0	6
Future Vol, veh/h	1	151	98	5	264	1	92	0	10	3	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	4	4	4	4	4	4	0	0	0
Mvmt Flow	1	176	114	6	307	1	107	0	12	3	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	308	0	0	290	0	0	558	555	233	561	612	308
Stage 1	-	-	-	-	-	-	235	235	-	320	320	-
Stage 2	-	-	-	-	-	-	323	320	-	241	292	-
Critical Hdwy	4.15	-	-	4.14	-	-	7.14	6.54	6.24	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.236	-	-	3.536	4.036	3.336	3.5	4	3.3
Pot Cap-1 Maneuver	1236	-	-	1260	-	-	437	437	801	441	411	737
Stage 1	-	-	-	-	-	-	764	707	-	696	656	-
Stage 2	-	-	-	-	-	-	685	649	-	767	675	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1236	-	-	1260	-	-	430	434	801	432	408	737
Mov Cap-2 Maneuver	-	-	-	-	-	-	430	434	-	432	408	-
Stage 1	-	-	-	-	-	-	763	706	-	695	652	-
Stage 2	-	-	-	-	-	-	674	645	-	755	674	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	15.8	11.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	450	1236	-	-	1260	-	-	597
HCM Lane V/C Ratio	0.264	0.001	-	-	0.005	-	-	0.018
HCM Control Delay (s)	15.8	7.9	0	-	7.9	0	-	11.1
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1	0	-	-	0	-	-	0.1

HCM 6th TWSC
1: N Hargrave Street & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	443	0	0	262	23	0	0	0	19	0	41
Future Vol, veh/h	69	443	0	0	262	23	0	0	0	19	0	41
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	1	1	1	2	2	2	2	2	2	25	25	25
Mvmt Flow	79	509	0	0	301	26	0	0	0	22	0	47

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	328	0	0	509	0	0	1005	995	509	982	982	315
Stage 1	-	-	-	-	-	-	667	667	-	315	315	-
Stage 2	-	-	-	-	-	-	338	328	-	667	667	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.12	6.52	6.22	7.35	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.35	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.35	5.75	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.518	4.018	3.318	3.725	4.225	3.525
Pot Cap-1 Maneuver	1237	-	-	1056	-	-	220	245	564	207	228	675
Stage 1	-	-	-	-	-	-	448	457	-	650	616	-
Stage 2	-	-	-	-	-	-	676	647	-	413	423	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1236	-	-	1056	-	-	195	229	564	197	213	674
Mov Cap-2 Maneuver	-	-	-	-	-	-	356	372	-	344	354	-
Stage 1	-	-	-	-	-	-	419	428	-	608	615	-
Stage 2	-	-	-	-	-	-	629	646	-	387	396	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0	0	13
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1236	-	-	1056	-	-	517
HCM Lane V/C Ratio	-	0.064	-	-	-	-	-	0.133
HCM Control Delay (s)	0	8.1	-	-	0	-	-	13
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0.2	-	-	0	-	-	0.5

HCM 6th TWSC
2: NE 232nd Avenue & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	290	110	11	187	0	83	0	11	1	0	0
Future Vol, veh/h	5	290	110	11	187	0	83	0	11	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	1	1	1	3	3	3	0	0	0
Mvmt Flow	6	326	124	12	210	0	93	0	12	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	210	0	0	450	0	0	634	634	388	640	696	210
Stage 1	-	-	-	-	-	-	400	400	-	234	234	-
Stage 2	-	-	-	-	-	-	234	234	-	406	462	-
Critical Hdwy	4.1	-	-	4.11	-	-	7.13	6.53	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.209	-	-	3.527	4.027	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1373	-	-	1116	-	-	390	395	658	391	368	835
Stage 1	-	-	-	-	-	-	624	600	-	774	715	-
Stage 2	-	-	-	-	-	-	767	709	-	626	568	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1373	-	-	1116	-	-	385	388	658	378	361	835
Mov Cap-2 Maneuver	-	-	-	-	-	-	385	388	-	378	361	-
Stage 1	-	-	-	-	-	-	620	596	-	769	706	-
Stage 2	-	-	-	-	-	-	758	700	-	611	565	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	17	14.6
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	405	1373	-	-	1116	-	-	378
HCM Lane V/C Ratio	0.261	0.004	-	-	0.011	-	-	0.003
HCM Control Delay (s)	17	7.6	0	-	8.3	0	-	14.6
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1	0	-	-	0	-	-	0

HCM 6th TWSC
1: N Hargrave Street & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	230	4	2	392	8	9	0	8	20	0	61
Future Vol, veh/h	23	230	4	2	392	8	9	0	8	20	0	61
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	4	4	4	5	5	5	2	2	2	0	0	0
Mvmt Flow	27	271	5	2	461	9	11	0	9	24	0	72

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	470	0	0	276	0	0	834	802	274	802	800	466
Stage 1	-	-	-	-	-	-	328	328	-	470	470	-
Stage 2	-	-	-	-	-	-	506	474	-	332	330	-
Critical Hdwy	4.14	-	-	4.15	-	-	7.12	6.52	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.236	-	-	2.245	-	-	3.518	4.018	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	1081	-	-	1270	-	-	288	317	765	305	320	601
Stage 1	-	-	-	-	-	-	685	647	-	578	563	-
Stage 2	-	-	-	-	-	-	549	558	-	686	649	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1081	-	-	1270	-	-	249	308	765	295	311	601
Mov Cap-2 Maneuver	-	-	-	-	-	-	405	457	-	474	472	-
Stage 1	-	-	-	-	-	-	668	631	-	564	562	-
Stage 2	-	-	-	-	-	-	483	557	-	661	633	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0	12.2	12.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	520	1081	-	-	1270	-	-	564
HCM Lane V/C Ratio	0.038	0.025	-	-	0.002	-	-	0.169
HCM Control Delay (s)	12.2	8.4	-	-	7.8	-	-	12.7
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.6

HCM 6th TWSC
2: NE 232nd Avenue & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	155	102	5	265	1	93	0	10	3	0	6
Future Vol, veh/h	1	155	102	5	265	1	93	0	10	3	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	4	4	4	4	4	4	0	0	0
Mvmt Flow	1	180	119	6	308	1	108	0	12	3	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	309	0	0	299	0	0	566	563	240	569	622	309
Stage 1	-	-	-	-	-	-	242	242	-	321	321	-
Stage 2	-	-	-	-	-	-	324	321	-	248	301	-
Critical Hdwy	4.15	-	-	4.14	-	-	7.14	6.54	6.24	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.236	-	-	3.536	4.036	3.336	3.5	4	3.3
Pot Cap-1 Maneuver	1235	-	-	1251	-	-	432	433	794	436	405	736
Stage 1	-	-	-	-	-	-	757	702	-	695	655	-
Stage 2	-	-	-	-	-	-	684	648	-	760	669	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1235	-	-	1251	-	-	426	430	794	427	402	736
Mov Cap-2 Maneuver	-	-	-	-	-	-	426	430	-	427	402	-
Stage 1	-	-	-	-	-	-	756	701	-	694	651	-
Stage 2	-	-	-	-	-	-	673	644	-	748	668	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	16	11.2
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	446	1235	-	-	1251	-	-	593
HCM Lane V/C Ratio	0.269	0.001	-	-	0.005	-	-	0.018
HCM Control Delay (s)	16	7.9	0	-	7.9	0	-	11.2
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.1	0	-	-	0	-	-	0.1

HCM 6th TWSC
1: N Hargrave Street & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	443	11	8	262	23	8	0	4	19	0	41
Future Vol, veh/h	69	443	11	8	262	23	8	0	4	19	0	41
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	1	1	1	2	2	2	2	2	2	25	25	25
Mvmt Flow	79	509	13	9	301	26	9	0	5	22	0	47

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	328	0	0	522	0	0	1030	1020	516	1009	1013	315
Stage 1	-	-	-	-	-	-	674	674	-	333	333	-
Stage 2	-	-	-	-	-	-	356	346	-	676	680	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.12	6.52	6.22	7.35	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.35	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.35	5.75	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.518	4.018	3.318	3.725	4.225	3.525
Pot Cap-1 Maneuver	1237	-	-	1044	-	-	212	237	559	198	218	675
Stage 1	-	-	-	-	-	-	444	454	-	635	605	-
Stage 2	-	-	-	-	-	-	661	635	-	408	417	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1236	-	-	1044	-	-	186	220	559	185	202	674
Mov Cap-2 Maneuver	-	-	-	-	-	-	349	366	-	329	341	-
Stage 1	-	-	-	-	-	-	416	425	-	594	599	-
Stage 2	-	-	-	-	-	-	609	629	-	379	390	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0.2	14.3	13.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	399	1236	-	-	1044	-	-	506
HCM Lane V/C Ratio	0.035	0.064	-	-	0.009	-	-	0.136
HCM Control Delay (s)	14.3	8.1	-	-	8.5	-	-	13.2
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	0.5

HCM 6th TWSC
2: NE 232nd Avenue & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	292	112	11	191	0	87	0	11	1	0	0
Future Vol, veh/h	5	292	112	11	191	0	87	0	11	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	1	1	1	3	3	3	0	0	0
Mvmt Flow	6	328	126	12	215	0	98	0	12	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	215	0	0	454	0	0	642	642	391	648	705	215
Stage 1	-	-	-	-	-	-	403	403	-	239	239	-
Stage 2	-	-	-	-	-	-	239	239	-	409	466	-
Critical Hdwy	4.1	-	-	4.11	-	-	7.13	6.53	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.209	-	-	3.527	4.027	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1367	-	-	1112	-	-	386	391	655	386	363	830
Stage 1	-	-	-	-	-	-	622	598	-	769	711	-
Stage 2	-	-	-	-	-	-	762	706	-	623	566	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1367	-	-	1112	-	-	381	384	655	374	356	830
Mov Cap-2 Maneuver	-	-	-	-	-	-	381	384	-	374	356	-
Stage 1	-	-	-	-	-	-	618	594	-	764	702	-
Stage 2	-	-	-	-	-	-	753	698	-	608	563	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	17.4	14.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	400	1367	-	-	1112	-	-	374
HCM Lane V/C Ratio	0.275	0.004	-	-	0.011	-	-	0.003
HCM Control Delay (s)	17.4	7.6	0	-	8.3	0	-	14.7
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.1	0	-	-	0	-	-	0

Queuing and Blocking Report
2022 Existing Conditions - AM Peak Hour

07/11/2022

Intersection: 1: N Hargrave Street & NE 28th Street

Movement	EB	SB
Directions Served	L	LTR
Maximum Queue (ft)	22	37
Average Queue (ft)	2	10
95th Queue (ft)	13	34
Link Distance (ft)		502
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: NE 232nd Avenue & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	6	18	66	35
Average Queue (ft)	0	1	28	9
95th Queue (ft)	5	10	52	32
Link Distance (ft)	1832	929	811	188
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report
2022 Existing Conditions - PM Peak Hour

07/11/2022

Intersection: 1: N Hargrave Street & NE 28th Street

Movement	EB	SB
Directions Served	L	LTR
Maximum Queue (ft)	24	69
Average Queue (ft)	1	15
95th Queue (ft)	11	50
Link Distance (ft)		502
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: NE 232nd Avenue & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	14	39	58	21
Average Queue (ft)	1	3	26	1
95th Queue (ft)	7	19	48	10
Link Distance (ft)	1832	929	811	188
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report
2024 Background Conditions - AM Peak Hour

07/11/2022

Intersection: 1: N Hargrave Street & NE 28th Street

Movement	EB	SB
Directions Served	L	LTR
Maximum Queue (ft)	30	70
Average Queue (ft)	7	33
95th Queue (ft)	26	57
Link Distance (ft)		502
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: NE 232nd Avenue & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	2	24	72	35
Average Queue (ft)	0	1	33	9
95th Queue (ft)	2	12	56	31
Link Distance (ft)	1832	929	811	188
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report
2024 Background Conditions - PM Peak Hour

07/11/2022

Intersection: 1: N Hargrave Street & NE 28th Street

Movement	EB	SB
Directions Served	L	LTR
Maximum Queue (ft)	38	84
Average Queue (ft)	13	38
95th Queue (ft)	37	74
Link Distance (ft)		502
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: NE 232nd Avenue & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	17	34	68	27
Average Queue (ft)	1	3	35	1
95th Queue (ft)	10	17	60	12
Link Distance (ft)	1832	929	811	188
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report
2024 Buildout Conditions - AM Peak Hour

07/11/2022

Intersection: 1: N Hargrave Street & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	36	17	34	64
Average Queue (ft)	6	1	13	33
95th Queue (ft)	27	7	38	55
Link Distance (ft)			800	502
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100	100		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: NE 232nd Avenue & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	2	23	79	33
Average Queue (ft)	0	1	36	9
95th Queue (ft)	3	12	63	32
Link Distance (ft)	1832	929	811	188
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report
2024 Buildout Conditions - PM Peak Hour

07/11/2022

Intersection: 1: N Hargrave Street & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	38	30	35	93
Average Queue (ft)	12	3	10	39
95th Queue (ft)	36	17	34	78
Link Distance (ft)			800	502
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100	100		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: NE 232nd Avenue & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	22	39	82	18
Average Queue (ft)	1	5	34	1
95th Queue (ft)	11	23	62	9
Link Distance (ft)	1832	929	811	188
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0