

Appendix A Master Plan TIA



## MEMORANDUM

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Date: November 20, 2014 Project #: 13865

To: Curleigh Carothers, P.E.; City of Camas

cc: Ryan Lopossa, P.E.; City of Vancouver  
Jeff Barsness, P.E.; Washington State Department of Transportation  
David Jardin, Clark County  
Randy Printz, Landerholm Law Firm  
John Schmidt and John O'Neil; Green Mountain Land, LLC

From: Chris Brehmer, P.E., Kelly Laustsen, and Ribeka Toda; Kittelson & Associates, Inc.

Project: Green Mountain Master Plan

Subject: Transportation Impact Analysis

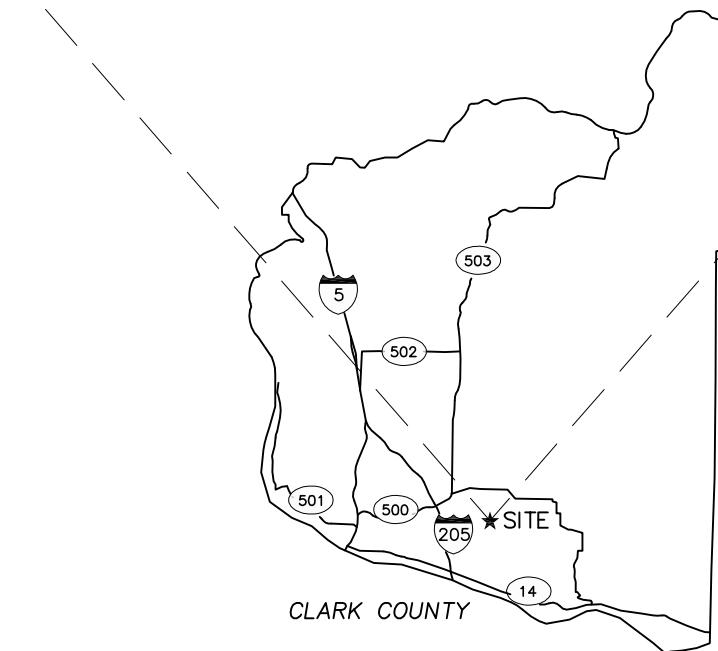
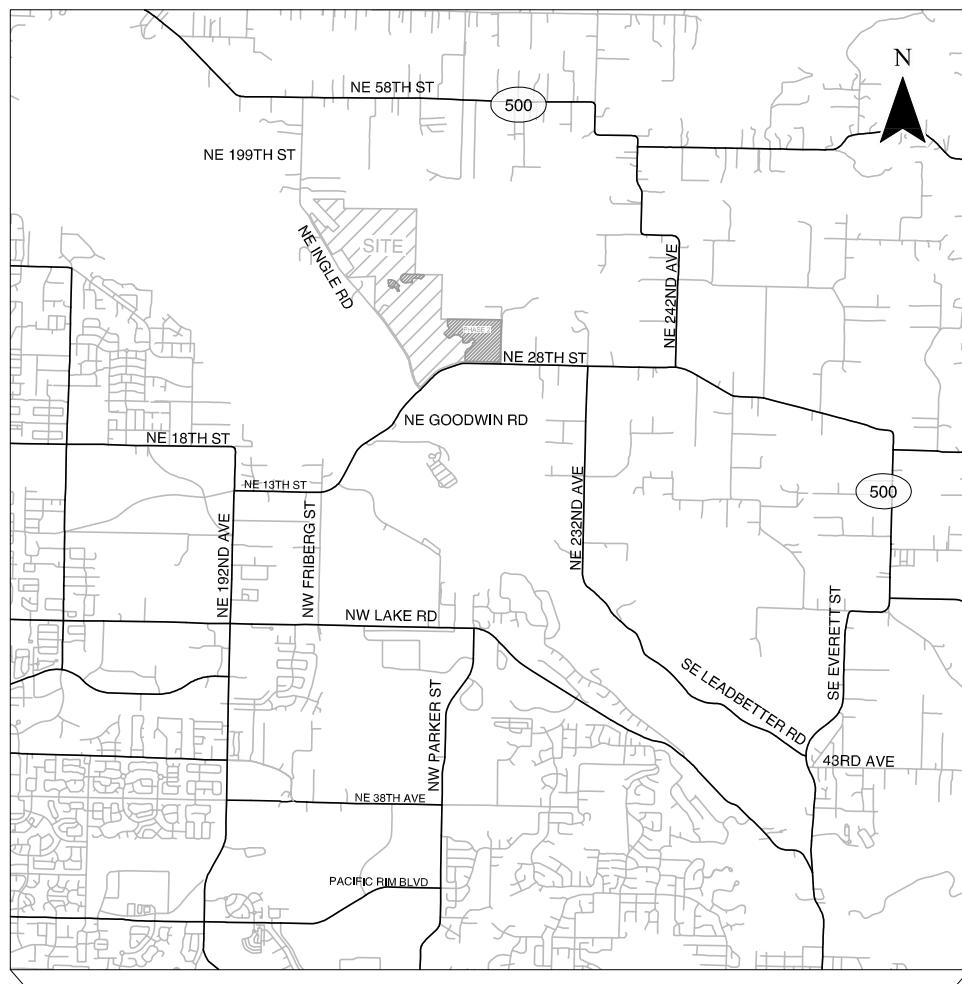
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This memorandum documents the results of the transportation impact analysis prepared by Kittelson & Associates, Inc. (KAI) for the proposed Green Mountain Master Plan development to be located at the northeast corner of NE Ingle Road and NE Goodwin Road in Camas, Washington. This study concludes that Phase 1 of the site can be developed as proposed while maintaining safe and acceptable traffic operations at the study intersections assuming provision of an eastbound left-turn lane on NE Goodwin Road at NE Ingle Road. Further transportation improvements are recommended to accommodate full build-out of the proposed development. The methodology of our analysis, pertinent findings, and our recommendations are documented in this memorandum.

## INTRODUCTION

Green Mountain Land, LLC is in the process of preparing a master plan to establish a mixed-use development on the 283-acre site. Green Mountain Golf Course is currently located on a large portion of the property; otherwise the site is vacant. The site is currently zoned for a mix of residential uses (R-10, MF-10 and R-6) and Community Commercial (CC). Figure 1 illustrates the site vicinity map.

The master plan proposes eight phases of development, with the sequence and timing of phases largely market dependent. It is expected that Phase 1 will be completed by 2018 and full master plan build-out will be assumed by 2029 for traffic impact assessment purposes.



Site Vicinity  
Camas, Washington

Figure  
1

Figure 2 illustrates a conceptual image of the master plan site vision. A mix of residential and commercial uses is planned in accordance with the zoning, with a mixed use village proposed to better integrate the commercially zoned portion of the property. The village would be located at the southwest corner of the project and will encompass approximately twenty-four acres. Further project details are provided later in this report.

## SCOPE OF THE REPORT

This analysis identifies the transportation-related impacts associated with the proposed Green Mountain Master Plan development and was prepared in accordance with City of Camas transportation impact analysis requirements. The study scope and overall study area for this project were selected based on a review of the local transportation system and direction provided by City of Camas, City of Vancouver, Clark County, and Washington Department of Transportation (WSDOT) staff.

Operational analyses were performed at the following intersections:

- NE 199<sup>th</sup> Avenue/NE 58<sup>th</sup> Street (SR 500, WSDOT maintained)
- NE 192<sup>nd</sup> Avenue/NE 13<sup>th</sup> Street (City of Vancouver maintained)
- NW Friberg Street/NE Goodwin Road
- NE Ingle Road/NE Goodwin Road
- NE 232<sup>nd</sup> Avenue/NE 28<sup>th</sup> Street
- NE 242<sup>nd</sup> Avenue (SR 500)/NE 28<sup>th</sup> Street (WSDOT maintained)
- NW Friberg Street/NW Lake Road
- NW Parker Street/NW Lake Road
- NE Everett Street (SR 500)/SE Leadbetter Road
- NW Parker Street/NE 38<sup>th</sup> Avenue
- NE Everett Street (SR 500)/NE 43<sup>rd</sup> Avenue (WSDOT maintained)
- Site-Access Driveways

# GREEN MOUNTAIN

## CONCEPTUAL MASTER PLAN FOR A MIXED USE PRD

CAMSAS, WASHINGTON

GREEN MOUNTAIN LAND, LLC. 11/19/14

### EXHIBIT B

TOTAL SITE AREA 283.3 AC

#### SITE AREA TABLE

R10 ZONE	119.7 AC
R6 ZONE	54.8 AC
MF10 ZONE	93.0 AC
CC ZONE	15.8 AC

#### RESIDENTIAL DENSITY CALCULATION

R-10	119.7 @ 4.3 / ACRES = 515 UNITS
R-6	54.8 @ 7.2 / ACRES = 395 UNITS
MF-10	93.0 @ 10 / ACRES = 930 UNITS

TOTAL

1840 UNITS

#### DENSITY TABLE

POD	ACRES	APPROXIMATE LOT SIZE RANGE	MAXIMUM UNITS/LOTS
A	12.2 (A1-A3)	HD	219
B	15.5 (B1-B5)	1000-3000	217
C	11.9 (C1-C2)	3000-5000	95
D	41.3 (D1-D6)	4000-6000	309
E	26.5 (E1-E4)	4200-7200	172
F	28.6 (F1-F4)	5250-9000	157
G	30.0 (G1)*	15,000-40,000	31
H	15.4 (CC)		100
TOTALS	181.4 AC		1300

\*40% OF G (TOTAL 50 ACRES) TO BE PRESERVED OPEN SPACE

PARK & OPEN SPACE 89.3 ± AC  
 NEIGHBORHOOD CIRCULATOR 8.2 ± AC  
 ARTERIAL & COLLECTOR FRONTAGE 1.8 ± AC  
 DEDICATION (GOODWIN & INGLE)

URBAN VILLAGE AREA (H, A1, A2, A3, B5)  
 A COMMERCIAL, MIXED USE AND RESIDENTIAL COMMUNITY CENTER (+ 33.5 AC GROSS, 24.2 AC NET)

#### CIRCULATION COMPONENTS

ARTERIAL



COLLECTOR



NEIGHBORHOOD CIRCULATOR



LOCATION SHOWN IS APPROXIMATE &amp; SUBJECT TO ADJUSTMENT

NEIGHBORHOOD CONNECTOR



LOCATION SHOWN IS APPROXIMATE &amp; SUBJECT TO ADJUSTMENT

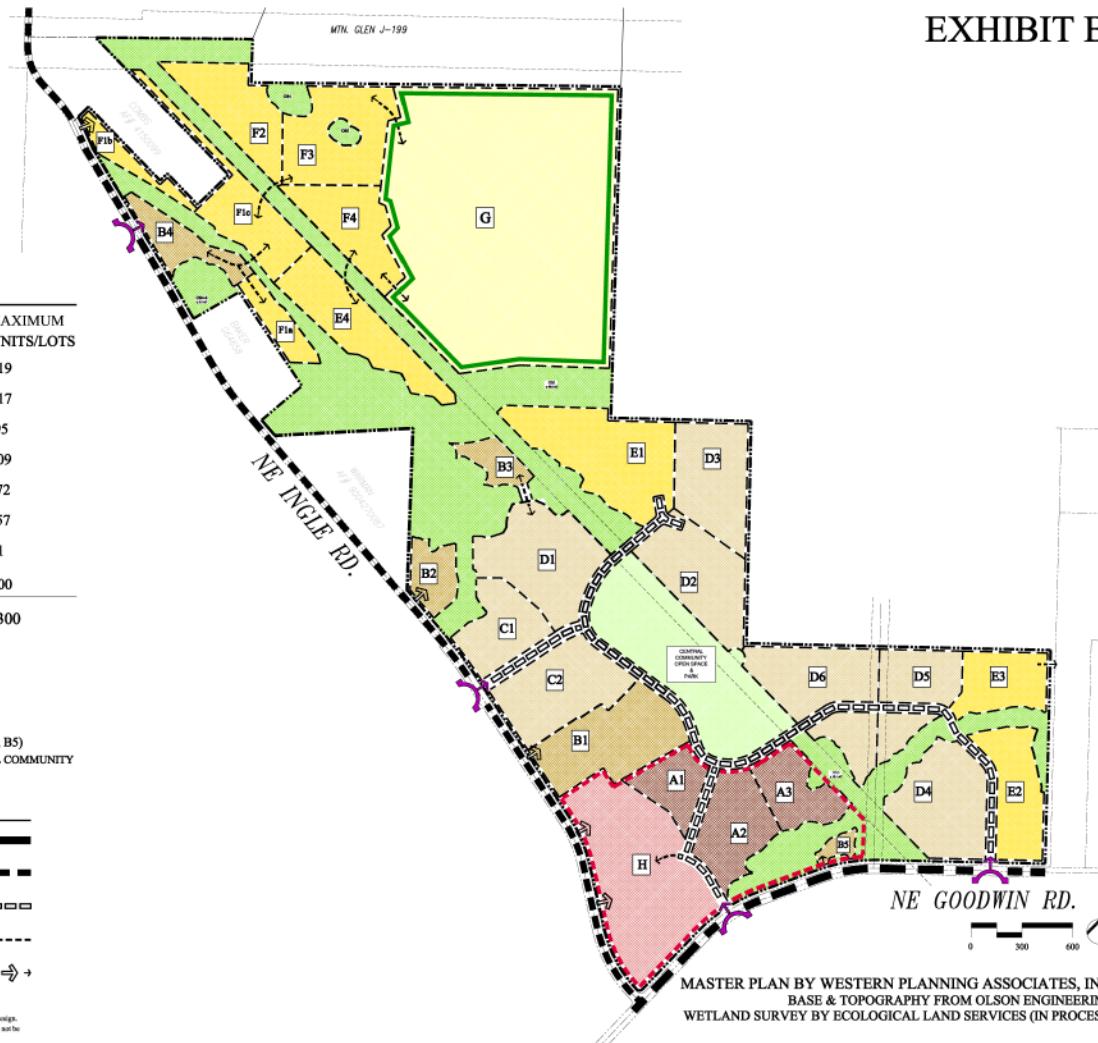
COMMUNITY ENTRIES &amp; ACCESS POINTS



LOCATION SHOWN IS APPROXIMATE &amp; SUBJECT TO ADJUSTMENT

## NOTE:

The precise location and number of units within the pods are approximate due to the preliminary nature of the design.  
 While unit numbers per pod may change, the total number of units of the proposed Mixed Use Master Plan will not be exceeded, absent express consent from the City after appropriate regulatory process.



Plan provided by Western  
Planning Associates,

11/19/14

Conceptual Master Plan  
Camas, Washington

Figure  
2

As required by the City of Camas, a transportation impact study was prepared to address the following transportation issues:

- Year 2014 existing land use and transportation system conditions within the site vicinity during the weekday a.m. and p.m. peak hours;
- Planned developments and transportation improvements in the study area;
- Trip generation and distribution estimates for the proposed development;
- Forecast year 2018 background traffic conditions without the proposed development during the weekday a.m. and p.m. peak hours;
- Forecast year 2018 total traffic conditions with the completion of Phase 1 of the proposed development during the weekday a.m. and p.m. peak hours;
- Forecast year 2029 background traffic conditions without the proposed development during the weekday a.m. and p.m. peak hours;
- Forecast year 2029 total traffic conditions with full build-out and occupancy of the proposed development during the weekday a.m. and p.m. peak hours;
- Level of service analyses for the study intersections; and
- On-site access and circulation.

Conclusions and recommendations are provided following the operational analysis.

## ANALYSIS METHODOLOGY

All level of service analyses described in this report were performed in accordance with the procedures stated in the *2000 Highway Capacity Manual* (Reference 1). A description of level of service and the criteria by which they are determined is presented in *Appendix "A"*. *Appendix "A"* also indicates how level of service is measured and what is generally considered the acceptable range of level of service.

To ensure that this analysis was based on a reasonable worst-case scenario, the peak 15 minute flow rate during the peak hour analysis periods was used in the evaluation of all intersection levels of service. For this reason, the analysis reflects conditions that are only likely to occur for 15 minutes out of each average peak hour. Traffic conditions during other weekday hours and throughout the weekend will likely be better than those described in this report.

At the City of Vancouver-maintained NE 192<sup>nd</sup> Avenue/NE 13<sup>th</sup> Street intersection, the peak 15-minute flow rate was assessed by applying the peak 15-minute volume across the hour and not applying a peak hour factor in accordance with guidance provided by the City.

## Operating Standards

The study intersections are each operated and maintained by one of three impacted jurisdictions: WSDOT, the City of Vancouver, or the City of Camas. Each of these jurisdictions has their own operating standards. WSDOT requires LOS "E" or better for non-HSS (Highways of Statewide Significance) in urban areas, City of Vancouver requires LOS "E" or better and a v/c ratio of less than 0.95 for signalized intersections. The City of Camas requires LOS "D" or better and a v/c ratio of 0.90 or better for all intersections. Table 1 lists the study intersections, the responsible jurisdiction, and the corresponding operating standard.

Table 1: Operating Standards at Study Intersections

ID	Study Intersection	Jurisdiction	Standard
1	NE 199 <sup>th</sup> Avenue/NE 58 <sup>th</sup> Street (SR 500)	WSDOT	LOS "C" for non-HSS in rural area <sup>1</sup>
2	NE 192 <sup>nd</sup> Avenue/NE 13 <sup>th</sup> Street	Vancouver	LOS "E" and v/c ratio less than 0.95
3	NW Friberg Street/NE Goodwin Road	Camas	LOS "D" and v/c of 0.90 or better
4	NE Ingle Road/NE Goodwin Road	Camas	LOS "D" and v/c of 0.90 or better
5	NE 232 <sup>nd</sup> Avenue/NE 28 <sup>th</sup> Street	Camas	LOS "D" and v/c of 0.90 or better
6	NE 242 <sup>nd</sup> Avenue (SR 500)/NE 28 <sup>th</sup> Street	WSDOT	LOS "C" for non-HSS in rural area <sup>1</sup>
7	NW Friberg Street/NW Lake Road	Camas	LOS "D" and v/c of 0.90 or better
8	NW Parker Street/NW Lake Road	Camas	LOS "D" and v/c of 0.90 or better
9	NE Everett Street (SR 500)/SE Leadbetter Road	WSDOT	LOS "C" for non-HSS in rural area <sup>1</sup>
10	NW Parker Street/NE 38 <sup>th</sup> Avenue	Camas	LOS "D" and v/c of 0.90 or better
11	NE Everett Street (SR 500)/NE 43 <sup>rd</sup> Avenue	WSDOT	LOS "C" for non-HSS in rural area <sup>1</sup>

<sup>1</sup>The City of Camas TIF Update applied the WSDOT standard for facilities in urban areas (LOS "E" for non-HSS in urban area). Based on conversations with WSDOT, the standard for rural areas is currently applicable to the WSDOT study intersections.

Source: City of Camas Traffic Impact Fee Update (Reference 2)

## Turn Lane Guidelines

For roadways under Washington State jurisdiction, such as SR 500, WSDOT has defined traffic-volume based turn lane guidelines within the *WSDOT Design Manual* (Reference 3). Left-turn lane guidelines are provided in section 1310.04(2)(a) while right-turn lane guidelines are provided in section 1310.04(3).

## EXISTING CONDITIONS

The existing conditions analysis identifies site conditions and the current operational and geometric characteristics of roadways within the study area. These conditions will be compared with future conditions later in this report.

The site of the proposed development and surrounding study area was visited and inventoried in March 2014. At that time, information was collected regarding site conditions, adjacent land uses, existing traffic operations, and transportation facilities in the study area.

### Site Conditions and Adjacent Land Uses

The area encompassed by the master plan site is largely undeveloped. The southwest corner of the property is occupied by the Green Mountain Golf Course, a portion of which is proposed to remain open after completion of the Phase 1 master plan development. The areas surrounding the site are also largely undeveloped, with a few single family homes situated along NE 28<sup>th</sup> Street, NE 199<sup>th</sup> Avenue, and SR 500.

### Transportation Facilities

Table 2 provides a summary of key transportation facilities in the site vicinity and Figure 3 illustrates the existing lane configurations and traffic control devices at the study intersections.

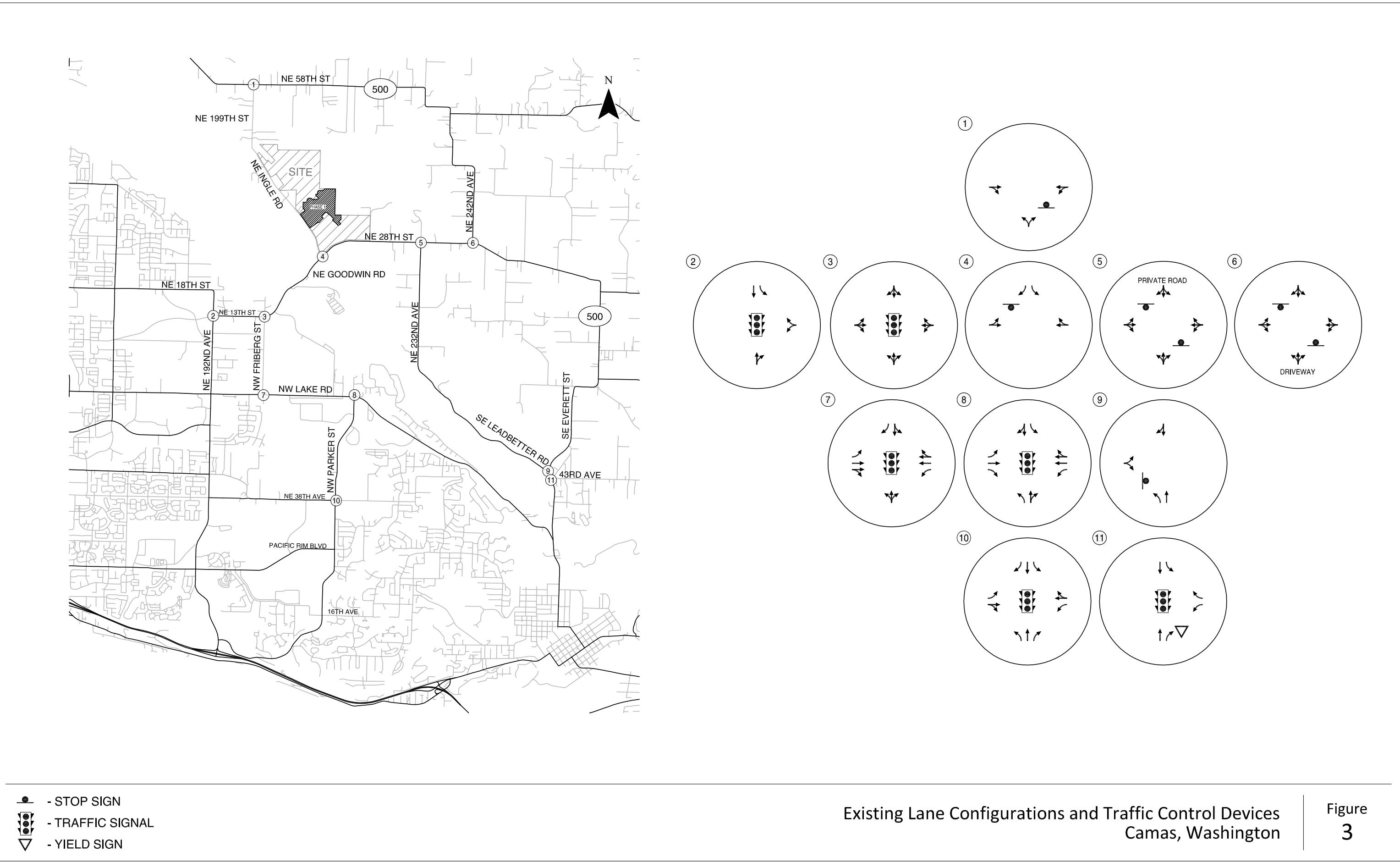


Table 2: Existing Transportation Facilities and Roadway Designations

Roadway	Classification <sup>1</sup>	Cross-Section	Speed Limit (mph)	Side-Walks?	Bicycle Lanes?	Median?	On-Street Parking?
NE 13 <sup>th</sup> Street / NE Goodwin Road / NE 28 <sup>th</sup> Street	Arterial	5-lane	40	Yes	Yes	Yes	None
SR 500	Non-HSS <sup>2</sup>	2-lane	50	None	None	None	None
NE Ingle Road / NE 199 <sup>th</sup> Avenue	Collector	2-lane	50	None	None	None	None
NE 192 <sup>nd</sup> Avenue	Arterial	2-lane	40	Partial	None	None	None
SE 192 <sup>nd</sup> Avenue	Arterial	5-lane	40	Partial	None	None	None
NW Friberg Street / NE 202 <sup>nd</sup> Avenue	Arterial	2-lane	40	Partial	None	None	None
SE 1 <sup>st</sup> Street / NW Lake Road	Arterial	5-lane	40	Yes	Yes	Yes	None
NW Parker Street	Arterial	5-lane	35	Yes	Yes	None	None
NE Everett Road	Arterial	2-lane	35	None	None	None	None
NW Pacific Rim Blvd./ SE 34 <sup>TH</sup> Street	Arterial	5-lane	40	Yes	None	Yes	None

<sup>1</sup> Source: City of Camas Traffic Impact Fee Update (Reference 2)

<sup>2</sup> HSS = Highways of Statewide Significance

## Pedestrian and Bicycle Facilities

Neither sidewalks nor striped bicycle facilities are provided in the vicinity of the site on either NE Ingle Road or NE Goodwin Road/NE 28<sup>th</sup> Street.

## Transit Facilities

The C-Tran *Camas Connector* Dial-A-Ride service currently operates within a portion of the study area, with a northern boundary of Lake Road, western boundary of Parker Street, and eastern boundary of SR 500. This service operates by accepting telephone calls from riders to be taken to a location inside a defined boundary. The hours of operation are Monday through Friday from 5:30 a.m. to 9:15 a.m. and 2:00 p.m. to 7:00 p.m. No service is available on holidays (Reference 4).

## Crash Analysis

The crash histories of the study intersections were reviewed in an effort to identify potential intersection safety issues. Crash records were obtained from WSDOT. The data represents records between January 1, 2008 and November 30, 2013. The crash rate was calculated to determine the number of crashes per million entering vehicles (MEV). Generally speaking, a crash rate greater than 1.0 crashes per MEV suggests locations where crash patterns should be reviewed in greater detail.

A brief discussion of the crash data at key intersections is presented after Table 3. There were no fatalities reported at the study intersections during the time periods studied. *Appendix "B" contains the crash data.*

As shown in Table 3, the two intersections where the highest crash rates were observed were NE 199<sup>th</sup> Avenue/NE 58<sup>th</sup> Street and NE Ingle Road/NE Goodwin Road. At all other intersections, the observed crash rates are well below 1.0 crash per million entering vehicles.

Table 3: Intersection Crash Histories (1/1/2008 - 11/30/2013)

Intersection	Total	Collision Type						Severity		Crash Rate Crashes/ MEV <sup>2</sup>
		Rear End	Turn -ing	Angle	Pedes -trian	Fixed Object	Road way Ditch	PDO <sup>1</sup>	Injury	
1. NE 199 <sup>th</sup> Ave / NE 58 <sup>th</sup> St (SR 500)	7	0	0	4	0	3	0	5	2	0.57
2. NE 192 <sup>nd</sup> Ave / NE 13 <sup>th</sup> St	8	1	6	0	0	1	0	4	4	0.27
3. NE Friberg St / NE Goodwin Rd	5	1	3	1	0	0	0	3	2	0.32
4. NE Ingle Rd / NE Goodwin Rd	16	4	0	5	1	4	2	11	5	1.03
5. NE 232 <sup>nd</sup> Ave / NE 28 <sup>th</sup> St	3	0	0	1	0	2	0	2	1	0.25
6. NE 242 <sup>nd</sup> Ave (SR 500)/ NE 28 <sup>th</sup> St	4	0	0	2	0	1	1	2	2	0.30
7. NW Friberg St / NW Lake Rd	6	3	0	1	0	2	0	6	0	0.24
8. NW Parker St / NW Lake Rd	3	0	1	0	0	2	0	3	0	0.12
9. NE Everett St (SR 500)/ SE Leadbetter Rd	5	0	0	0	0	3	2	2	3	0.54
10. NW Parker St / NE 38 <sup>th</sup> Ave	9	0	5	4	0	0	0	6	3	0.29
11. NE Everett St (SR 500) / NE 43 <sup>rd</sup> Ave	7	1	5	0	0	1	0	3	4	0.36

<sup>1</sup> PDO = Property Damage Only | <sup>2</sup> MEV = Million Entering Vehicles

### **NE 199<sup>th</sup> Avenue/NE 58<sup>th</sup> Street (SR 500)**

The second highest crash rate, 0.57, occurs at the intersection of NE 199<sup>th</sup> Avenue/NE 58<sup>th</sup> Street. There have been seven reported collisions, including four angle collisions and three fixed-object collisions at this intersection. The crash data was reviewed in an effort to identify potential trends. Three of the angle crashes involved vehicles making a northbound left turn from NE 199<sup>th</sup> Avenue to NE 58<sup>th</sup> Street; another involved an eastbound vehicle turning right from NE 58<sup>th</sup> Street to NE 199<sup>th</sup> Avenue. Of the three fixed object collisions, two involved utility poles and one involved a domestic animal. Collisions with domestic animals are challenging to eliminate and one of the collisions with the utility poles involved a driver asleep at the wheel. Four of the seven crashes occurred during wet road surface conditions. Given the relatively low number of reported collisions

and the unusual nature of three of the seven collisions (the three fixed-object collisions), there are no safety-based mitigation measures recommended at this intersection at this time in conjunction with site development. If an eastbound right-turn lane is added to the intersection in the future (which is currently warranted as will be described later in this report), it may provide safety benefits.

### ***NE Ingle Road/NE Goodwin Road***

The highest crash rate, 1.03, occurs at the intersection of NE Ingle Road/NE Goodwin Road. There have been reported collisions including 4 four rear-end collisions, 5 five angle collisions, 4 fixed-object collisions (involving a utility pole, a mailbox, a boulder, and a wood sign post), 2 roadway ditch collisions, and a pedestrian collision at this intersection. As discussed later in this report, the Green Mountain Master Plan proposes to construct an exclusive eastbound left-turn lane on NE Goodwin Road at NE Ingle Road in conjunction with the Phase 1 site development. Providing an eastbound left-turn lane and potential related reconfiguration of the southbound stop bar location (refer to sight distance discussion below) in conjunction with Phase 1 site development could provide a safety benefit at this intersection.

Two of the angle collisions involved vehicles exceeding reasonably safe speeds while making a westbound right-turn at the intersection. One of the recommended mitigation measures for the 2029 full build-out scenario of the proposed development is the addition of a westbound right-turn lane at this intersection, which could provide a safety benefit for turning vehicles. Additional long-term mitigation measures anticipated in conjunction with site development include constructing a three-lane roadway section on NE Goodwin Road along the site frontage and signalizing the intersection when warranted.

### **Intersection Sight Distance**

Intersection sight distance was observed at the study intersections and was found to meet applicable city or WSDOT standards, with the exception of the sight distance at the NE Ingle Road/NE Goodwin Road intersection. As shown in Exhibit 1 below, the stop bar on NE Ingle Road is set back approximately 25 feet from the edge of NE Goodwin Road.

### Exhibit 1: Stop Bar on NE Ingle Road at NE Goodwin Road



Image source: Google Maps (right image)

As indicated in Exhibit 2, vehicles currently pull past the stop bar to obtain sufficient sight distance to then execute a turning maneuver. Regardless of the proposed site development, we recommend that the City of Camas consider potential improvements to enhance the intersection sight distance, such as relocating the stop bar closer to NE Goodwin Road.

### Exhibit 2: Vehicle Waiting to Make Left-Turn from NE Ingle Road to NE Goodwin Road



### Existing Traffic Operations

Manual turning-movement counts were conducted at the study intersections in March and April 2014. The counts were conducted on a typical mid-week day during the morning peak period (7:00 to 9:00 a.m.) and the evening peak period (4:00 to 6:00 p.m.) per City requirements. Individual Intersection peak hours were then identified for operational analysis purposes.

Figures 4 and 5 provide a summary of the existing turning-movement counts, which are rounded to the nearest five vehicles per hour for the weekday a.m. and p.m. peak hours, respectively. *Appendix "C" contains the traffic count worksheets used in this study.*

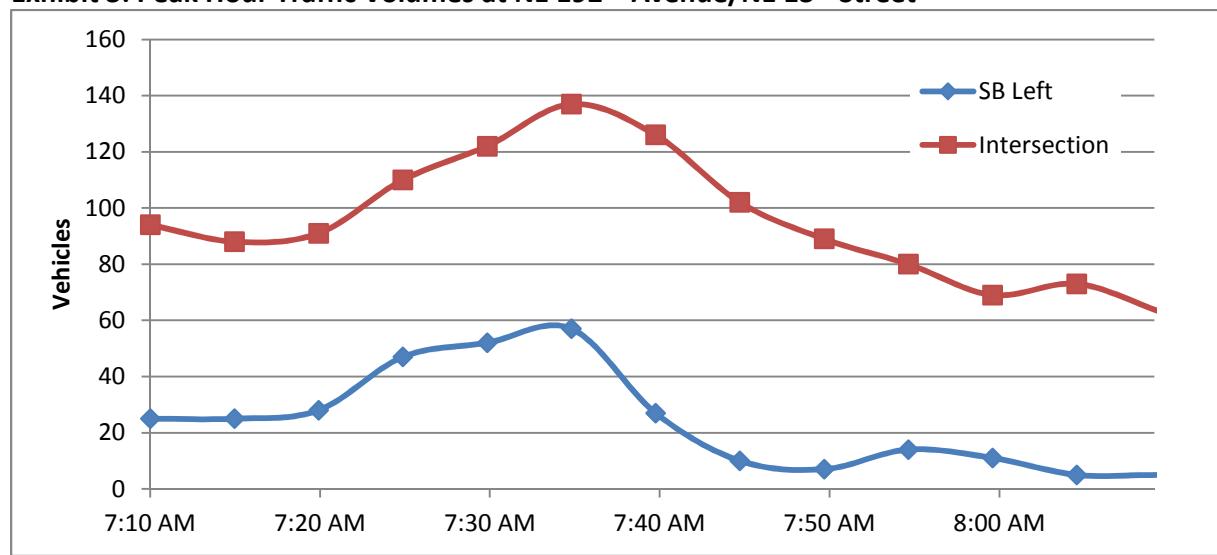
As shown in Figures 4 and 5, the study intersections operate acceptably during both study periods. *Appendix "D" contains the existing conditions traffic operations worksheets.*

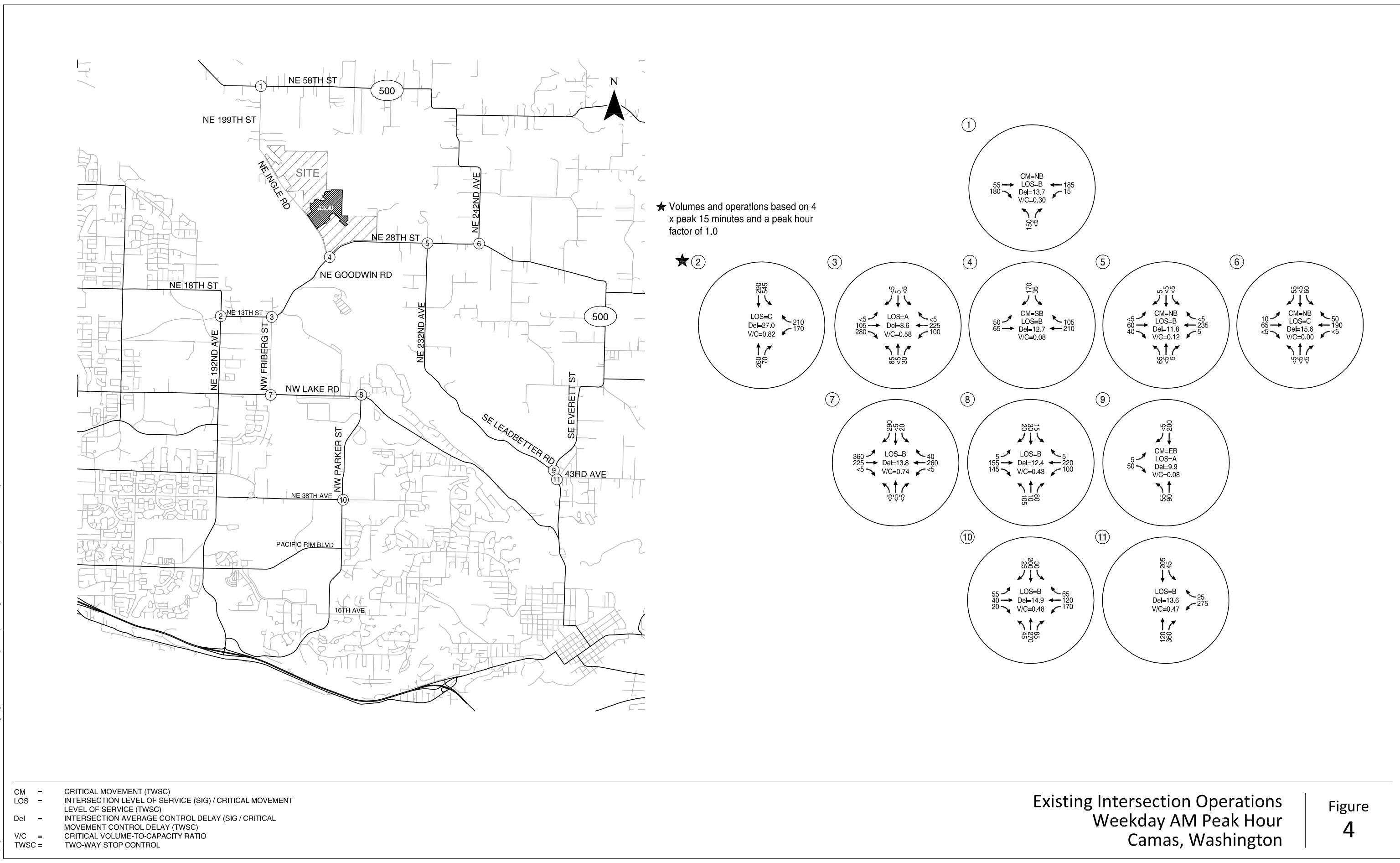
### ***Operations at NE 192<sup>nd</sup> Avenue / NE 13<sup>th</sup> Street***

As noted in the “Analysis Methodology” section, analysis of the City of Vancouver-maintained NE 192<sup>nd</sup> Avenue/NE 13<sup>th</sup> Street intersection involved application of the peak 15-minute flow rate across the hour and not applying a peak hour factor. This analysis methodology is in accordance with guidance provided by the City.

During the weekday AM peak hour, significant peaking occurs at the intersection related to vehicles accessing Union High School on NW Friberg Street. In particular, the southbound left-turning volume peaks in advance of the school start at 7:45 AM, as shown in Exhibit 3. During this “peak of the peak” period, queueing for the southbound left-turn lane sometimes exceeds the available striped storage (approximately 160 feet). Based on field observation, heightened delays and queueing for the southbound left-turn movement are contained to about fifteen minutes in advance of the school start, during which time some southbound left-turning vehicles do not clear through the intersection during each cycle. After this time, volumes decrease significantly and left-turning vehicles consistently clear through the intersection in a single cycle.

**Exhibit 3: Peak Hour Traffic Volumes at NE 192<sup>nd</sup> Avenue/NE 13<sup>th</sup> Street**

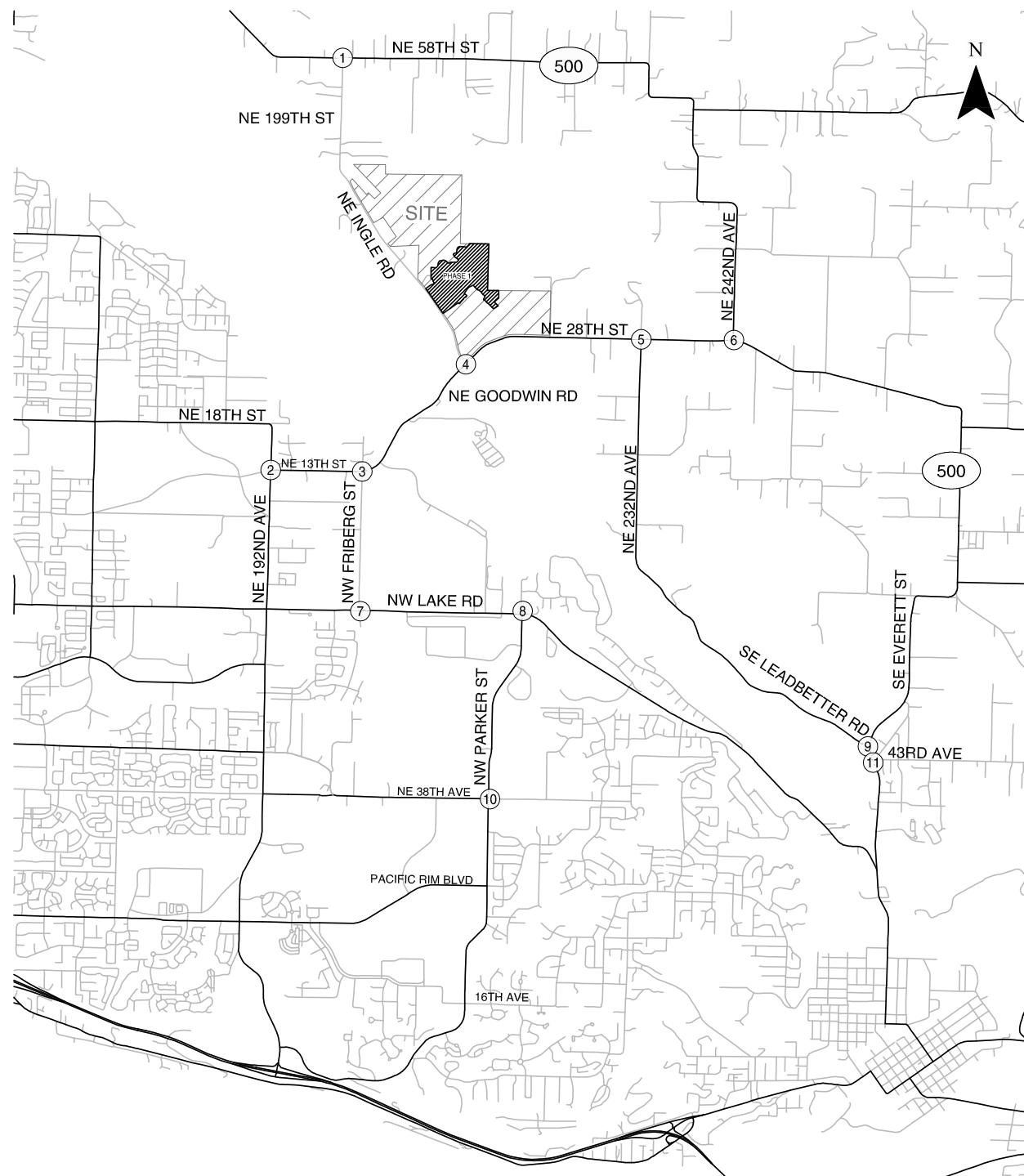




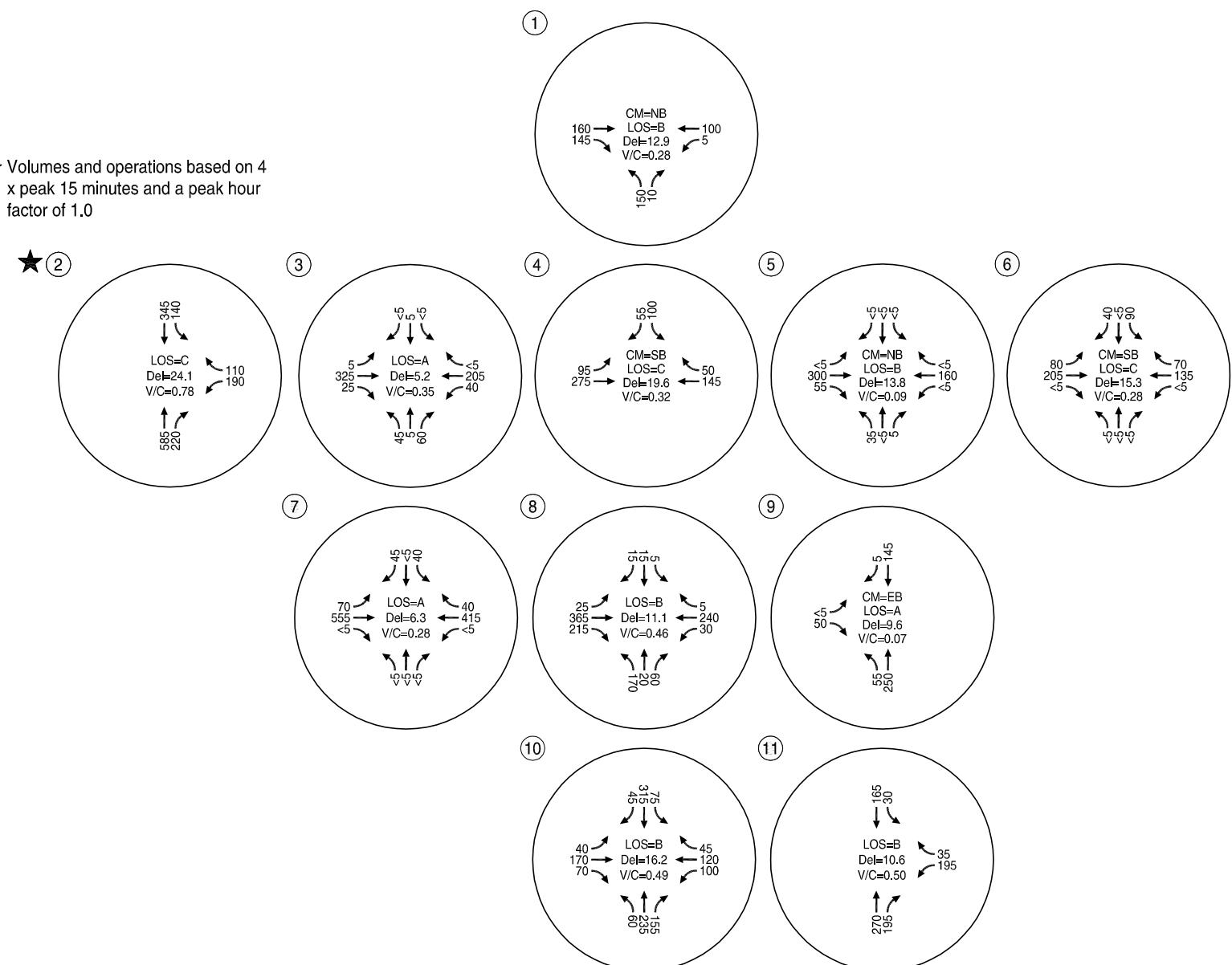
CM	=	CRITICAL MOVEMENT (TWSC)
LOS	=	INTERSECTION LEVEL OF SERVICE (SIG) / CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
DeI	=	INTERSECTION AVERAGE CONTROL DELAY (SIG / CRITICAL MOVEMENT CONTROL DELAY (TWSC))
V/C	=	CRITICAL VOLUME-TO-CAPACITY RATIO
TWSC	=	TWO-WAY STOP CONTROL

## Existing Intersection Operations Weekday AM Peak Hour Camas, Washington

# Figure 4



★ Volumes and operations based on 4 x peak 15 minutes and a peak hour factor of 1.0



Existing Intersection Operations  
Weekday PM Peak Hour  
Camas, Washington

Figure  
5

## TRAFFIC IMPACT ANALYSIS

The traffic impact analysis identifies how the study area's transportation system will operate upon phased build-out of the proposed master plan site. A horizon year of 2018 was selected to assess conditions with build-out of Phase 1 while a 15-year 2029 horizon year was assumed for site build-out. The impact of site-generated weekday a.m. and p.m. peak hour trips was examined as follows:

- Planned developments and transportation improvements in the study area were identified and accounted for;
- Trip generation and distribution estimates for the proposed development were prepared for Phase 1 and full build-out of the proposed development;
- Forecast year 2018 background traffic conditions without the proposed development were analyzed at the study intersections;
- Forecast year 2018 total traffic conditions with completion of Phase 1 of the proposed development were analyzed at the study intersections;
- Forecast year 2029 background traffic conditions without the proposed development were analyzed at the study intersections;
- Forecast year 2029 total traffic conditions with full build-out and occupancy of the proposed development were analyzed at the study intersections; and
- On-site circulation and site-access operations were evaluated.

### Proposed Development Plan

Green Mountain Land, LLC is proposing to master plan the 283-acre site with mixed-use development. Green Mountain Golf Course is currently located on a large portion of the master plan property. We understand that a portion of the existing Green Mountain Golf Course may remain temporarily available for use after completion of Phase 1 site development and that, ultimately, the golf course will be closed prior to full master plan build-out. No effort has been made to account for "credit" for existing trips to and from the golf course for the purposes of this transportation impact analysis report.

The master plan proposes eight phases of development, with the sequence and timing of phases to be finalized pending market conditions. It is expected that Phase 1 will be completed by 2018 and full master plan build-out is assumed by 2029 for traffic impact assessment purposes. A mix of residential and commercial uses is planned in accordance with the zoning, with a mixed use village proposed to better integrate the commercially zoned portion of the property. The application seeks

approval of an overlay zone for a portion of the site intended for an urban village. The village would be located at the southwest corner of the project and will encompass approximately twenty-four acres.

For traffic impact study purposes, Phase 1 is assumed to consist of a residential component with 215 single-family detached homes. Full build-out of the master plan residential component assumed construction of up to 536 apartment units and 764 single-family detached homes. The retail portion of the proposed development plan was assumed to develop after Phase 1 and was assumed to be a 90,000 square-foot shopping center for trip generation purposes<sup>1</sup>.

Access to Phase 1 development is anticipated along NE Ingle Road, with additional access added to NE Goodwin Road during later stages of the development. Final details of the number and location of site access points will be defined during preparation of individual site plan applications, therefore appropriate planning level assumptions have been made for master planning purposes. The proposed master plan anticipates two public street neighborhood circulator connections to NE Goodwin Road serving the site in conjunction with two public street neighborhood circulator connections along NE Ingle Road. The commercial site is expected to have direct driveway access to NE Ingle Road. Some residential areas (not individual residence driveways) not served by the anticipated neighborhood circulator facilities may also seek direct access to NE Ingle Road or NE Goodwin Road as appropriate.

### ***Trip Generation***

Trip generation estimates for the proposed development were generated based on information provided in the standard reference manual *Trip Generation, 9<sup>th</sup> Edition* published by the Institute of Transportation Engineers (ITE – Reference 7). The internal and pass-by trip rates applied to each land use were also determined from ITE's *Trip Generation, 9<sup>th</sup> Edition*. Table 4 summarizes the daily, weekday a.m., and weekday p.m. peak-hour trips for the Phase 1 assumed development while Table 5 summarizes the complete master plan site trip generation estimate. All daily trips have been rounded to the nearest ten and all peak hour trips have been rounded to the nearest five trips.

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<sup>1</sup> The unit mix for phase 1 and buildout was developed based on a reasonable worst-case scenario. Final development may result in a less-intense mix of residential units.

Table 4: Trip Generation Estimate – Phase 1

Land Use	ITE Code	Size	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Single-Family Detached Housing	210	215 units	2,050	160	40	120	215	135	80

Table 5: Trip Generation Estimate – Build-out (Includes Phase 1)

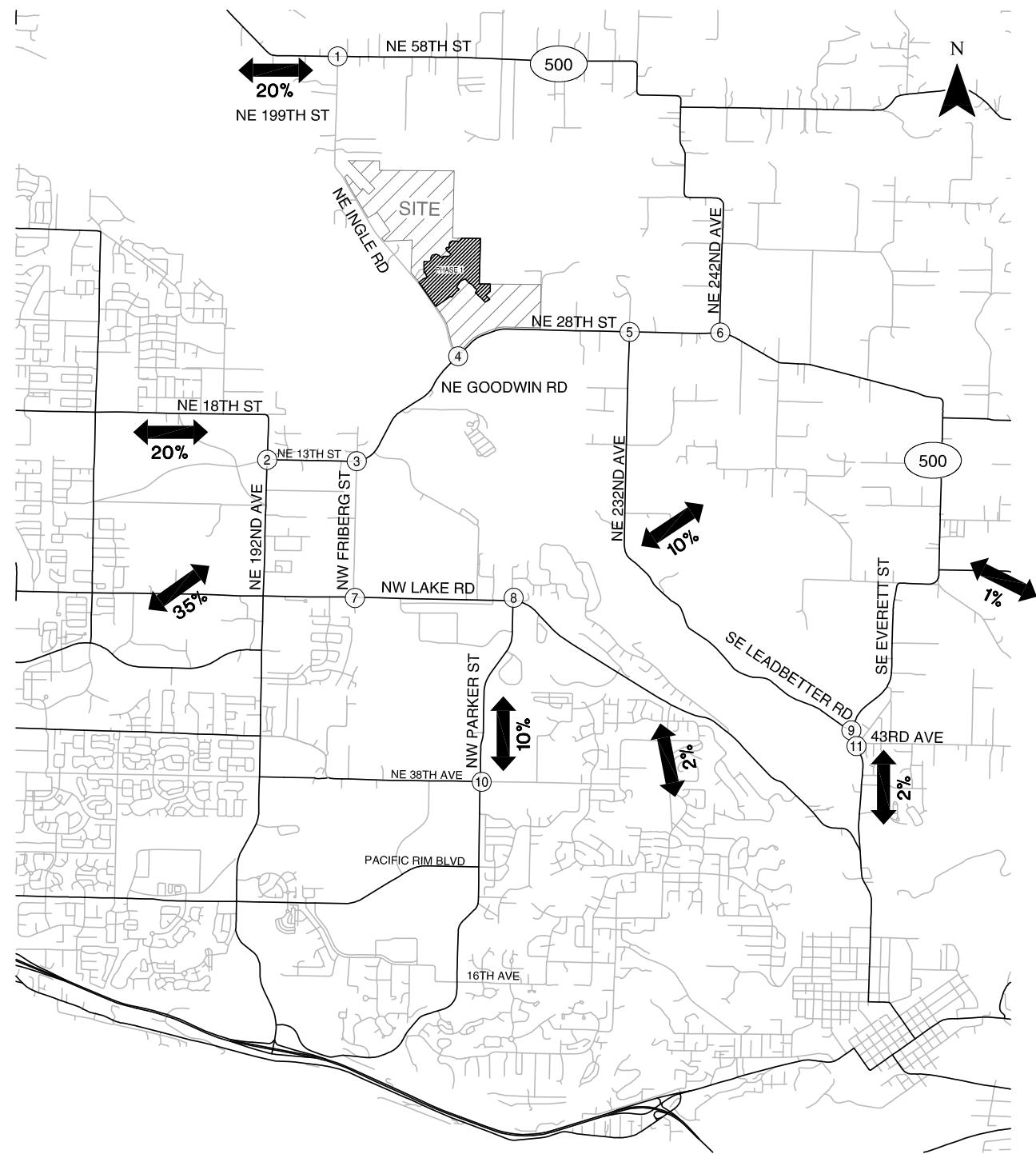
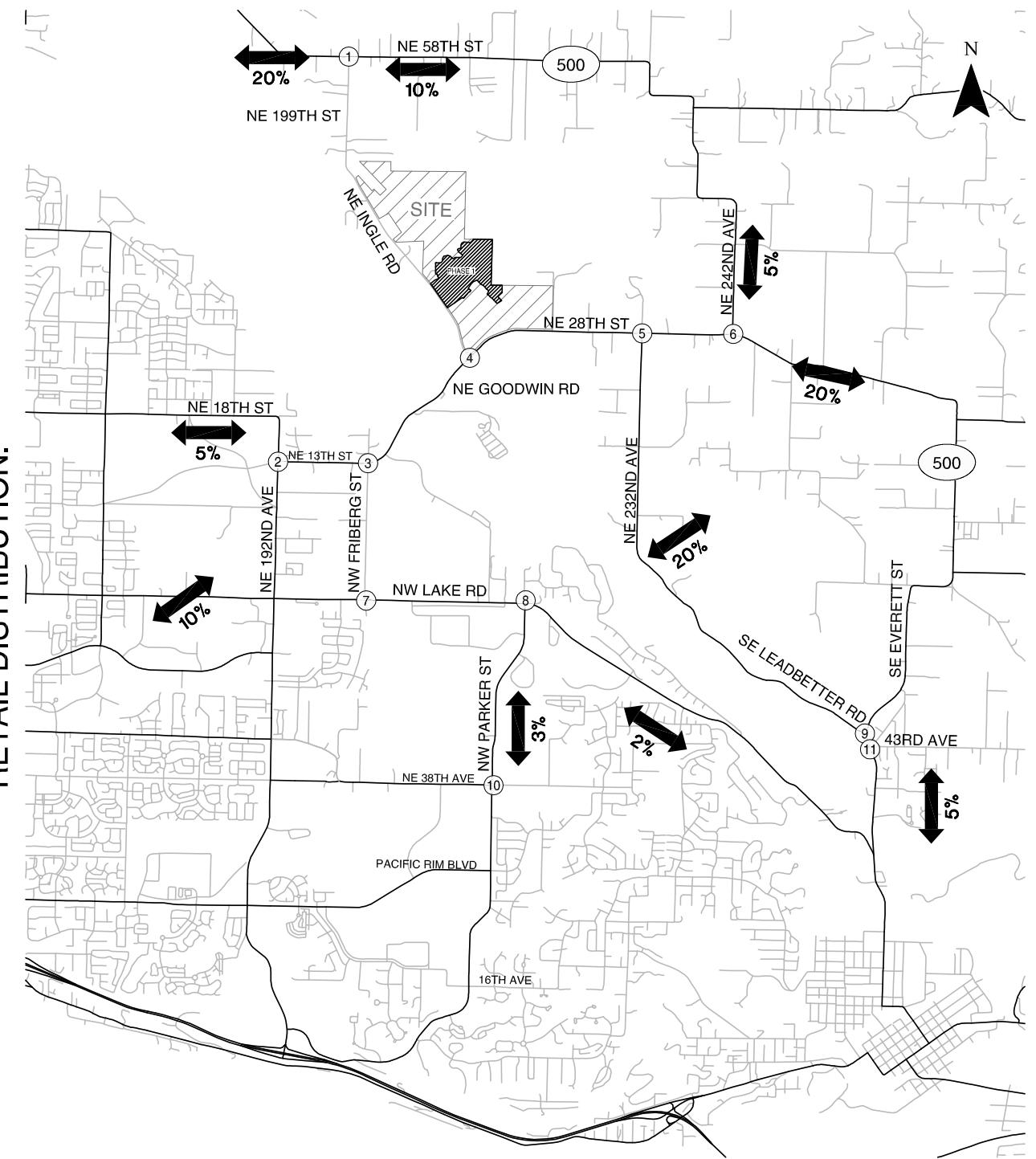
Land Use	ITE Code	Size	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Apartment	220	536 units	3,570	275	55	220	330	215	115
Single-Family Detached Housing	210	764 units	7,270	575	145	430	765	480	285
<b>Total Residential (1,300 units)</b>			<b>10,840</b>	<b>850</b>	200	650	1,095	695	400
<i>Internalization (6% Daily, 5% PM)</i>			630	0	0	0	60	30	30
Shopping Center	820	90,000 square feet	6,340	145	90	55	560	270	290
<i>Internalization (10% Daily, 11% PM)</i>			630	0	0	0	60	30	30
<i>Pass-By Trips (34%)</i>			1,940	50	25	25	170	85	85
<i>Total Trips</i>			17,180	995	290	705	1,655	965	690
<i>Less Internalization</i>			1,260	0	0	0	120	60	60
<i>Less Pass-by trips</i>			1,940	50	25	25	170	85	85
<b><i>Net New Trips for Full Build-out</i></b>			<b>13,980</b>	<b>945</b>	<b>265</b>	<b>680</b>	<b>1,365</b>	<b>820</b>	<b>545</b>

### Trip Distribution

The distribution of site-generated trips onto the study area roadway system was estimated based on a review of surrounding roadway characteristics, existing uses, the 2035 travel demand model maintained by the Southwest Washington Regional Transportation Council (RTC), and review agency guidance. Trip distribution patterns were developed separately for the residential and retail trips. Figure 6 illustrates the trip distribution patterns for the residential and retail trips.

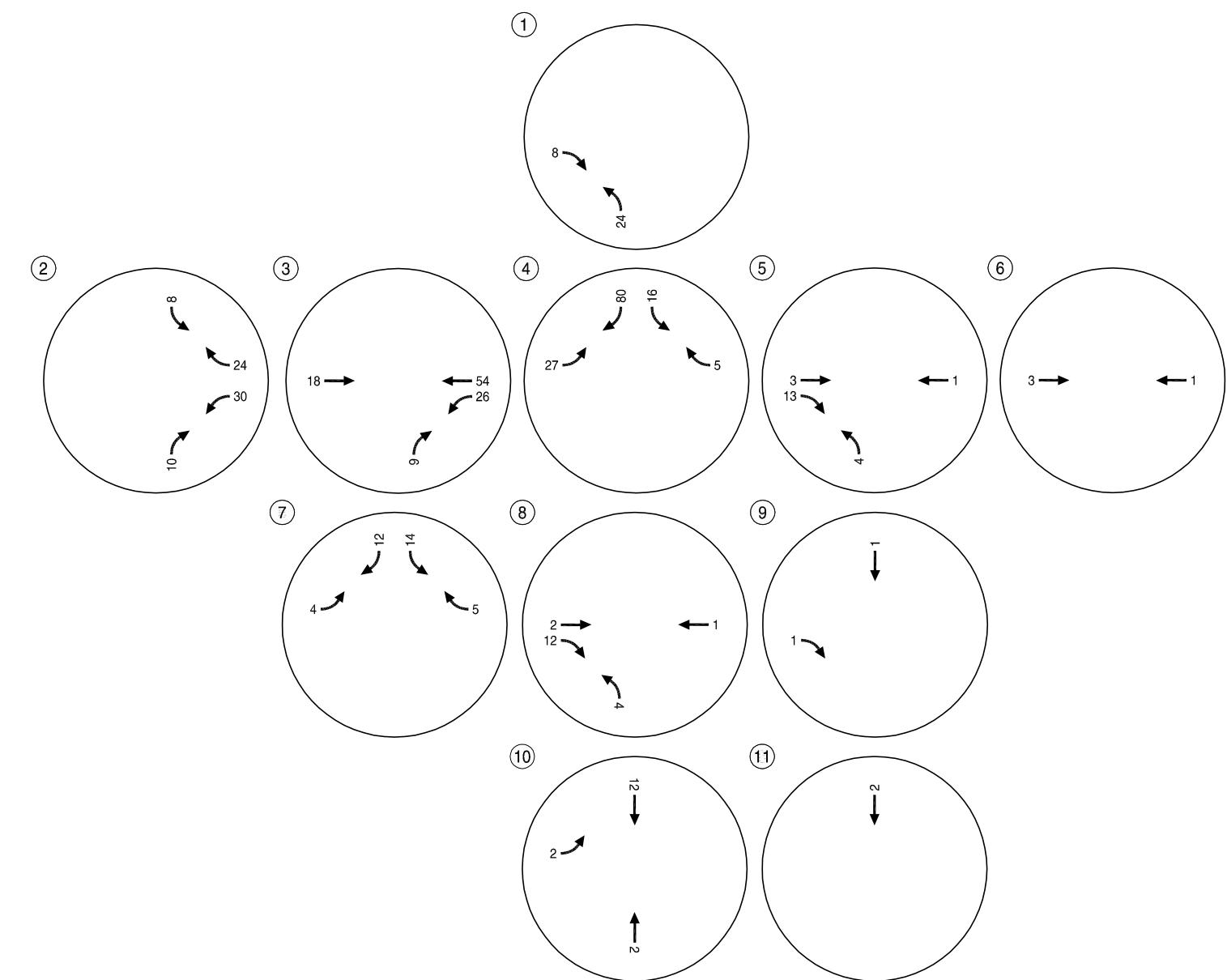
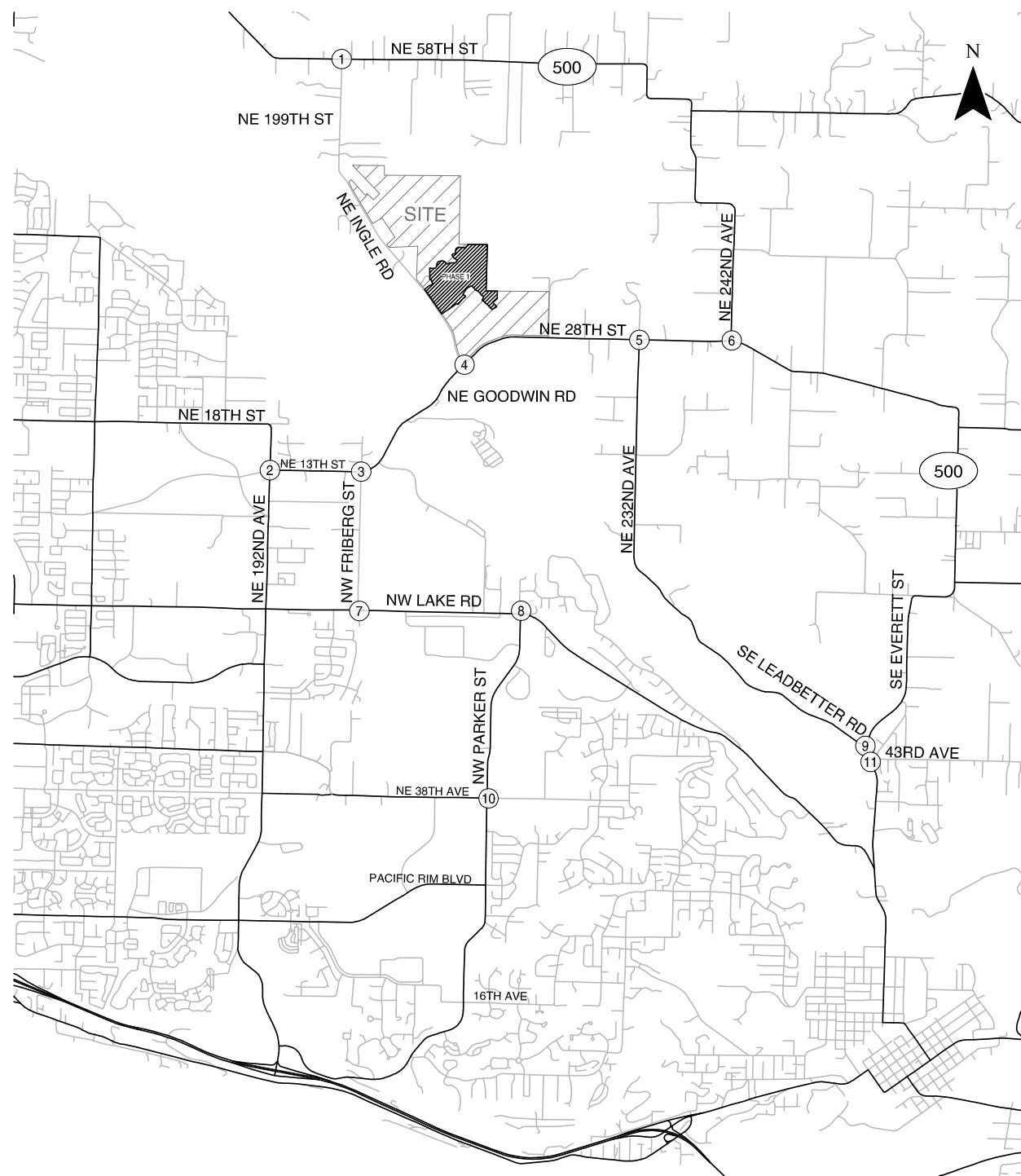
### Trip Assignment

The weekday a.m. and p.m. peak hour site trips shown in Tables 4 and 5 were assigned to the roadway network based on the trip distribution patterns shown in Figure 6. Figures 7 through 10 show the assignment of site-generated trips during the weekday a.m. and p.m. peak hours for Phase 1 and at Build-out. Note that the site-generated build-out volumes shown in Figures 9 and 10 include the Phase 1 site-generated trips and thus reflect the total number of trips generated. A figure showing the assignment of pass-by trips is provided in Appendix "E".

**RESIDENTIAL DISTRIBUTION:****RETAIL DISTRIBUTION:**

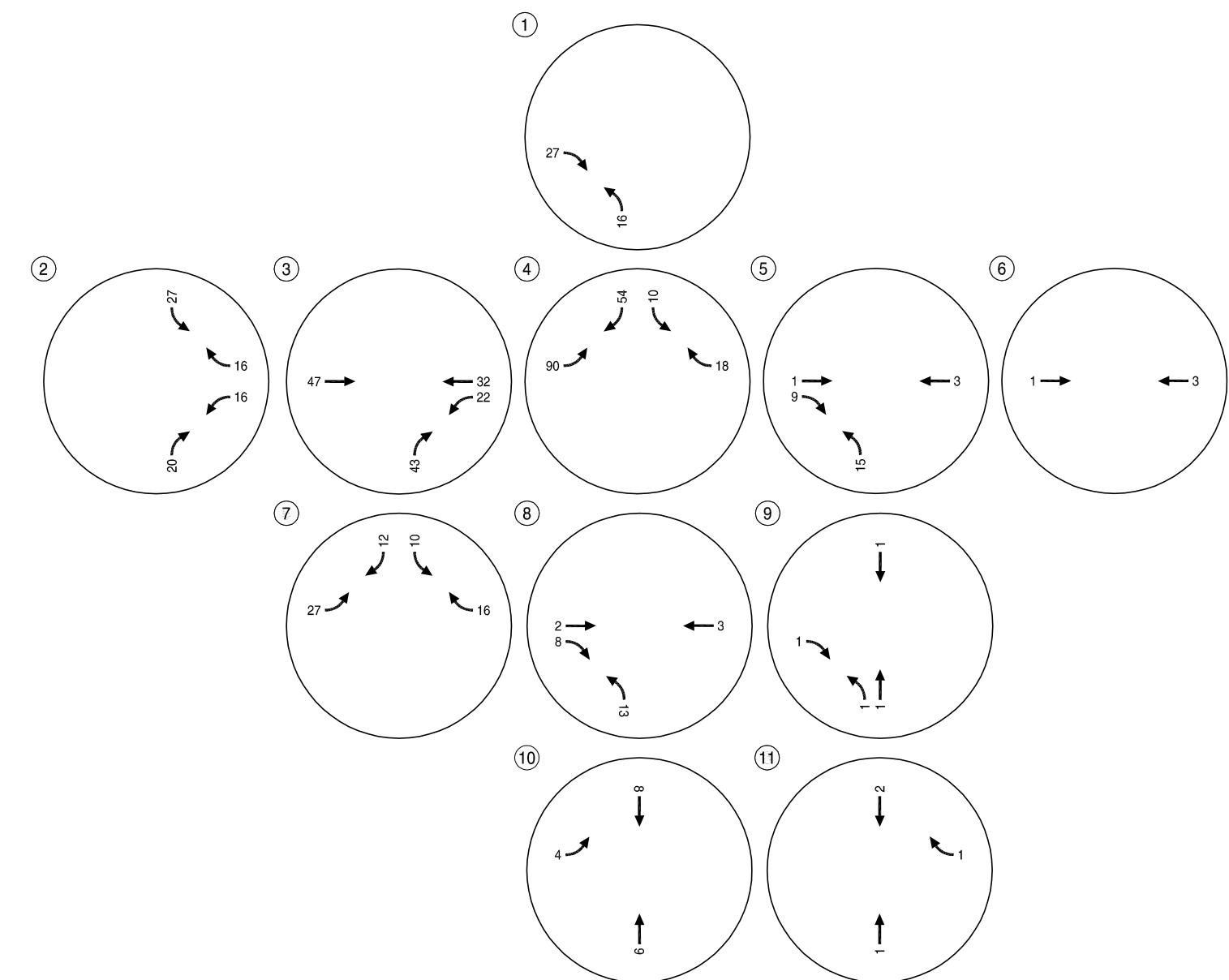
Estimated Trip Distribution Pattern  
Camas, Washington

Figure  
6



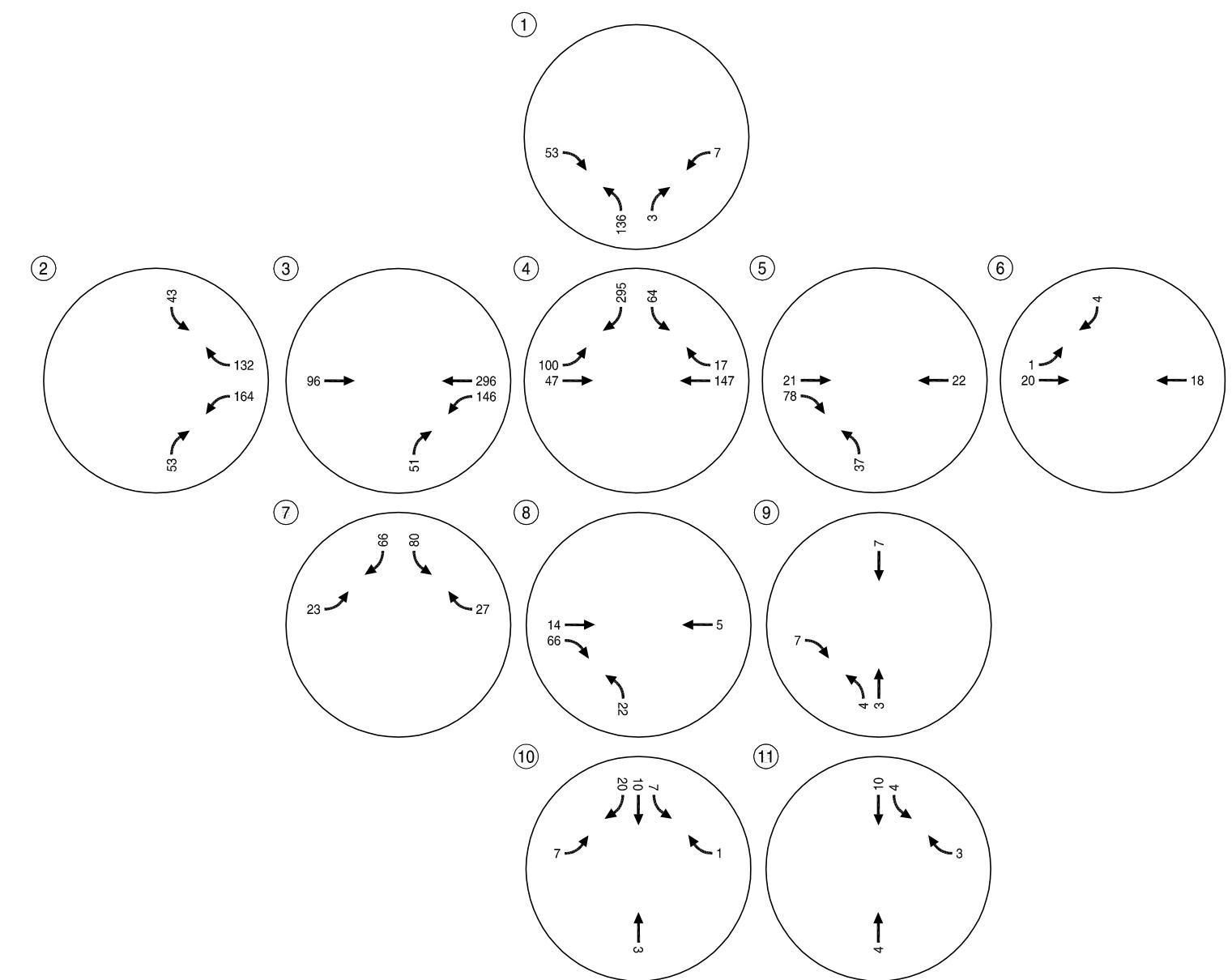
Total Estimated Trip Assignment - Phase 1  
Weekday AM Peak Hour  
Camas, Washington

Figure  
7



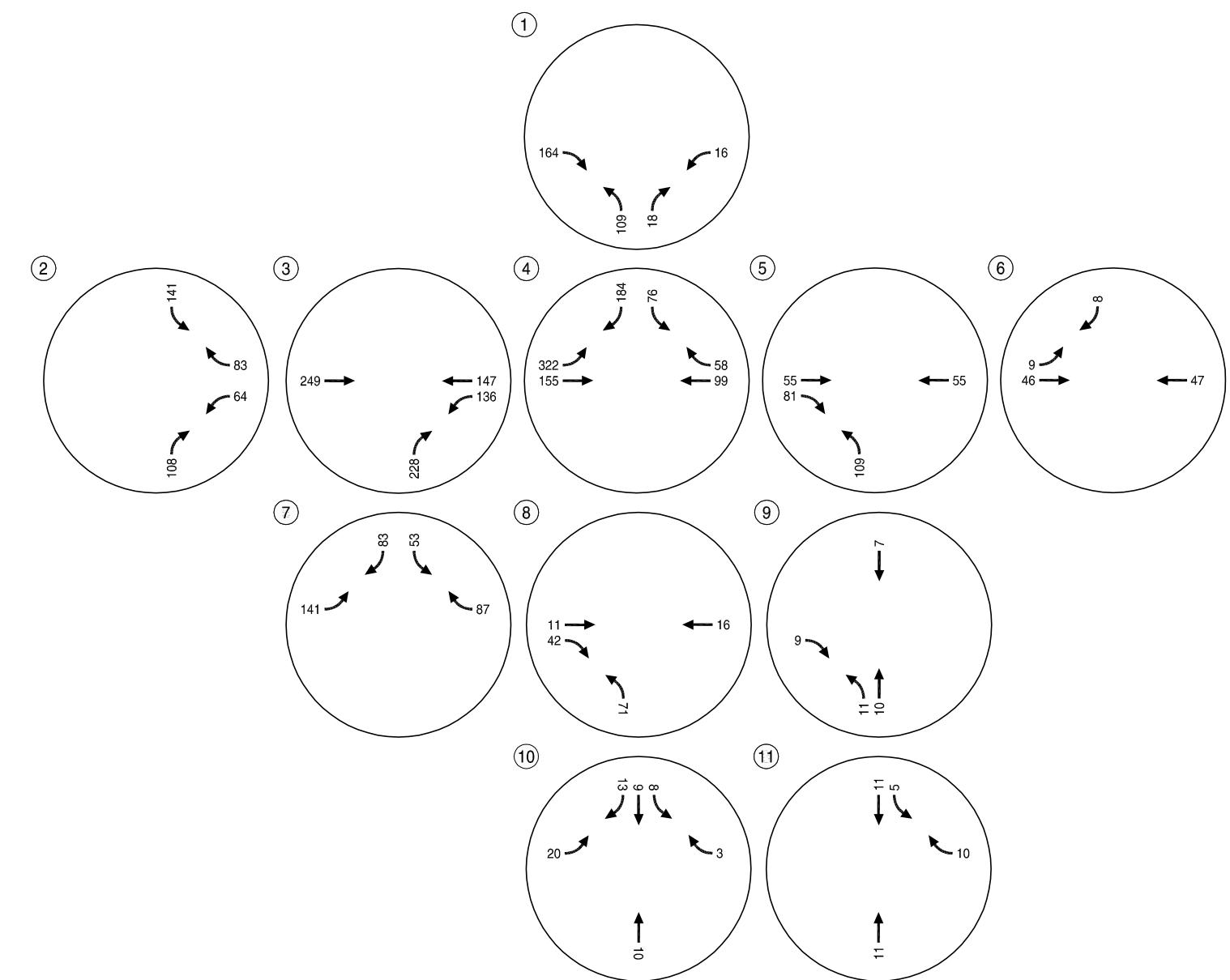
Total Estimated Trip Assignment - Phase 1  
Weekday PM Peak Hour  
Camas, Washington

Figure  
8



Total Estimated Trip Assignment - Full Build-Out  
Weekday AM Peak Hour  
Camas, Washington

Figure  
9



Total Estimated Trip Assignment - Full Build-Out  
Weekday PM Peak Hour  
Camas, Washington

Figure  
10

## 2018 Background Traffic Conditions

The 2018 background traffic analysis projects how the study area's transportation system will operate during the year that Phase 1 of the proposed development is expected to be completed. This analysis includes traffic growth due to previously approved in-process developments within the study area, but does not include traffic from any of the proposed Green Master Plan development phases. Per agency direction, no growth was applied to City of Camas roadways and a 2% growth rate was applied to City of Vancouver roadways (Reference 8).

### ***Planned Developments and Transportation Improvements***

City of Camas staff identified 13 local development projects that are approved but not yet occupied. These in-process developments include:

- Lake Hills
- Two Creeks
- The Summit at Columbia Vista
- Parker Village
- The Hills at Round Lake
- North Hills Subdivision
- Brady Road Subdivision
- Deerhaven Subdivision
- Hadley's Glen
- Millshore Downs
- Fisher Creek Campus
- Lacamas Prairie
- 192<sup>nd</sup> Plaza West

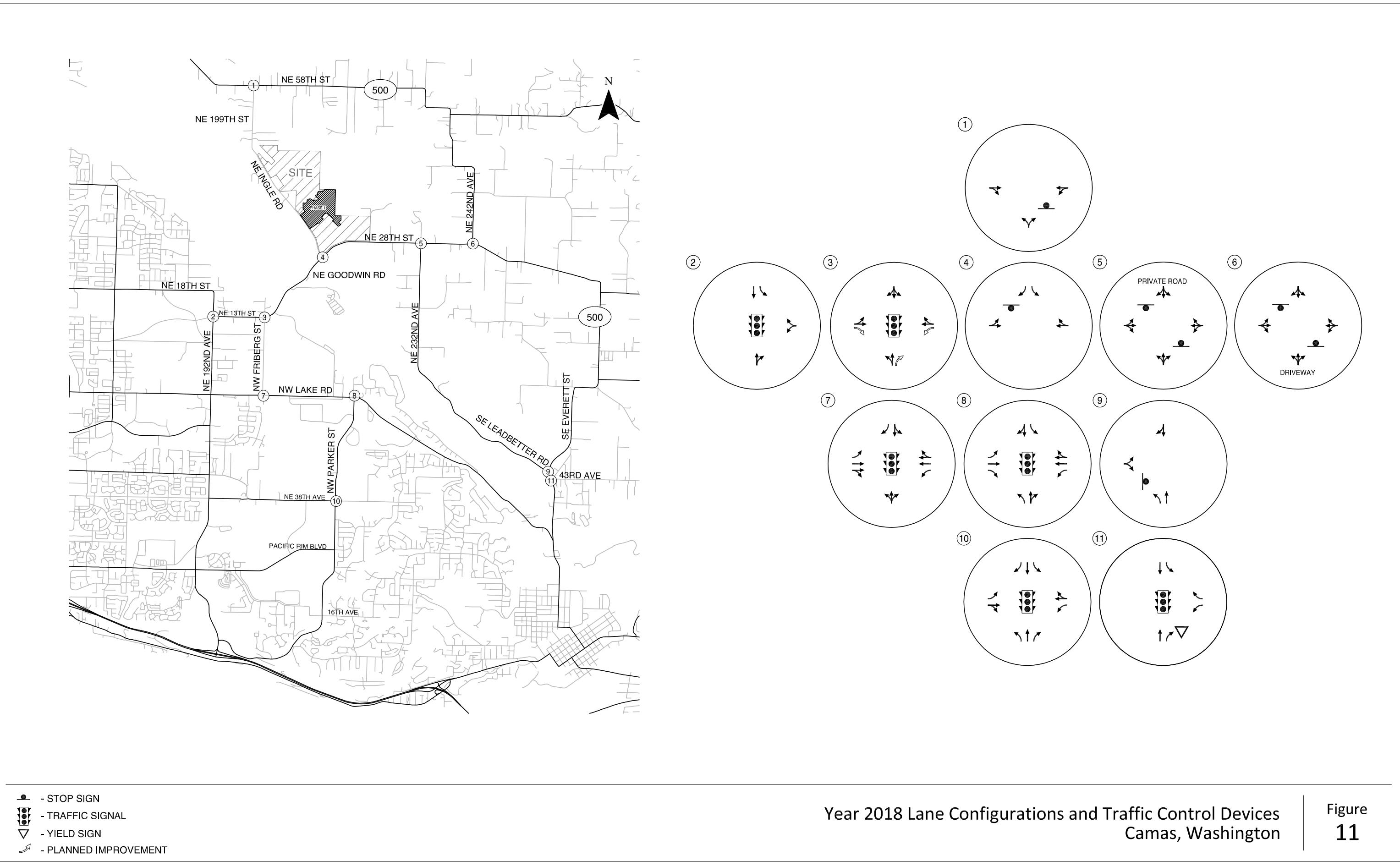
*Appendix "F" contains the data received pertaining to the in-process trips.*

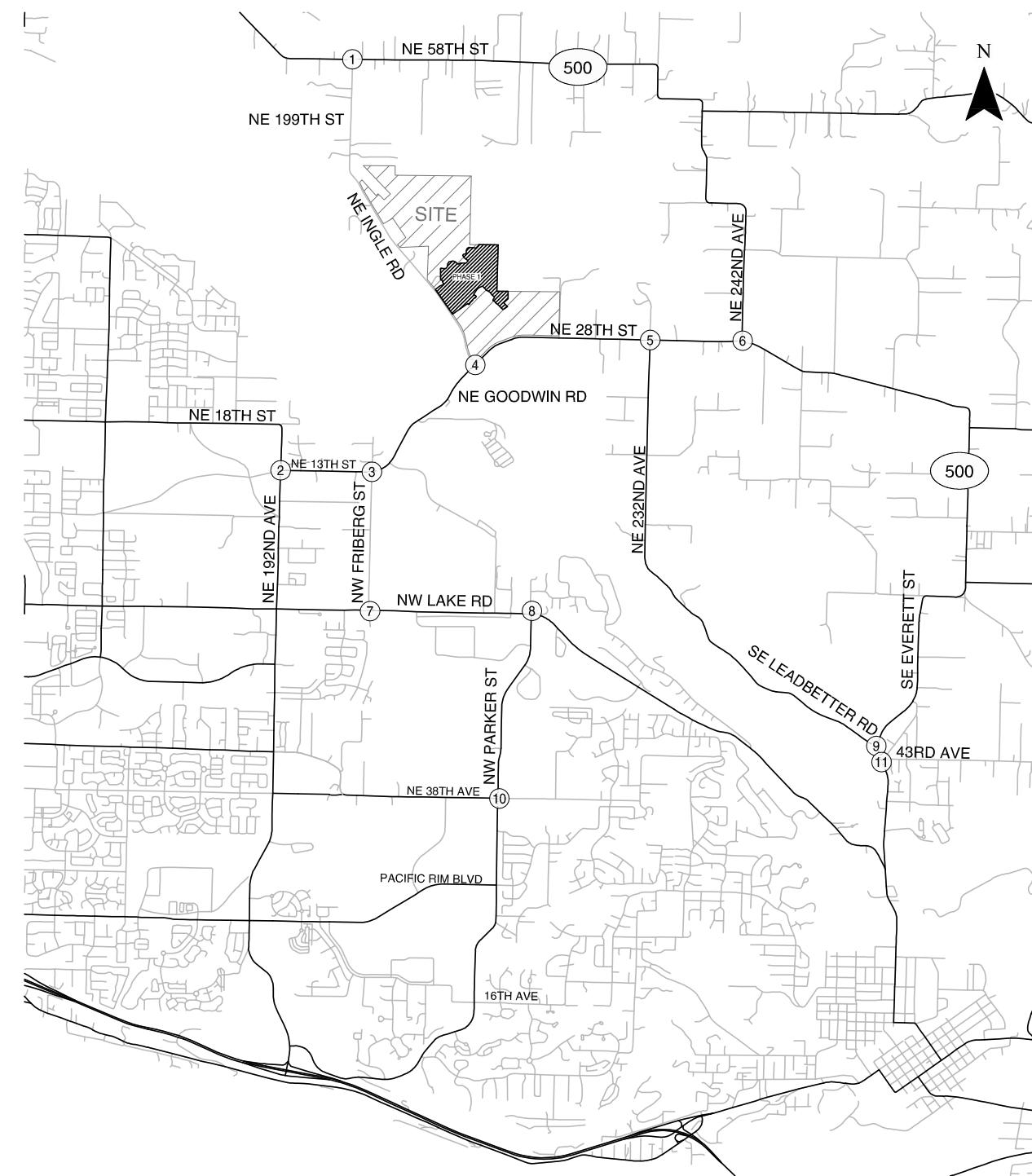
Planned and funded transportation improvements within the study area include the widening of NW Friberg Street (between Lake Road and NE 13<sup>th</sup> Street) and the addition of a westbound left-turn lane, northbound right-turn lane, and eastbound right-turn lane at the NW Friberg Street/NE Goodwin Road intersection. Figure 11 shows the lane configuration and traffic control devices assumed in the 2018 analysis.

### ***Traffic Operations***

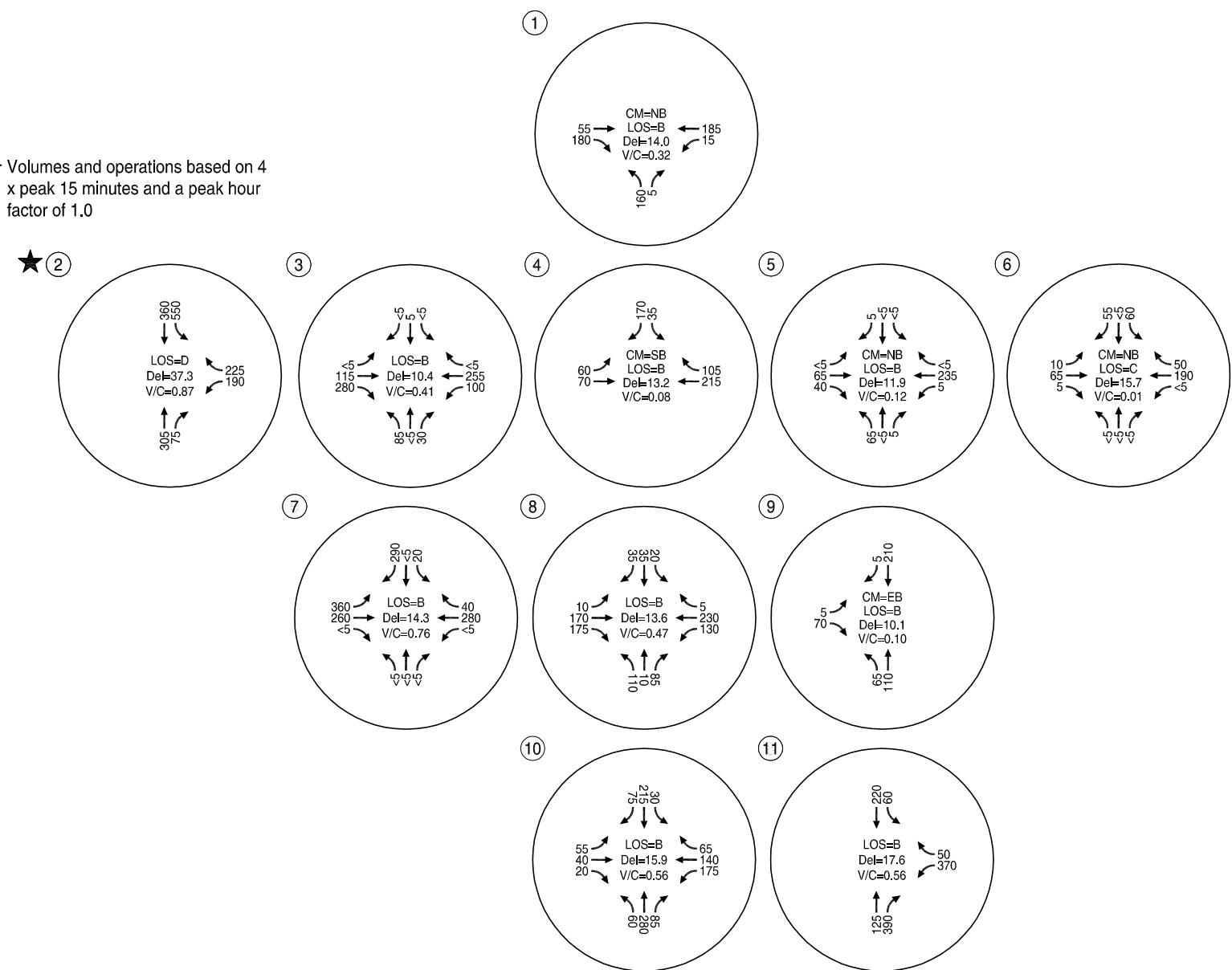
Figures 12 and 13 summarize the year 2018 background traffic operations analysis results at the study intersections for the weekday a.m. and weekday p.m. peak-hours, respectively. The projected turning movement counts are rounded to the nearest five vehicles per hour. As shown, the study intersections operate acceptably during the weekday a.m. and weekday p.m. peak periods in the 2018 background conditions.

*Appendix "G" contains the 2018 background conditions traffic operations worksheets.*





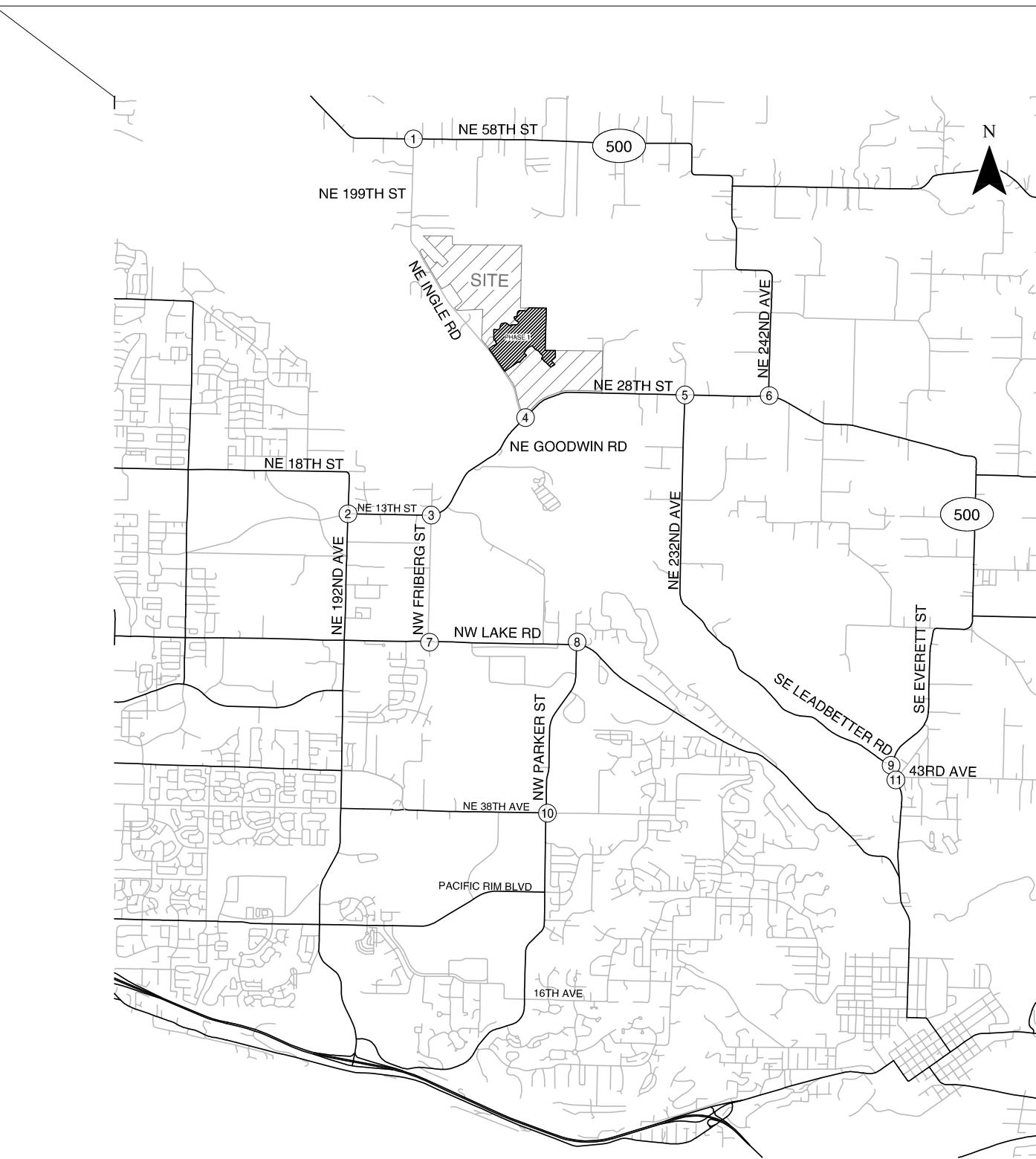
★ Volumes and operations based on 4 x peak 15 minutes and a peak hour factor of 1.0



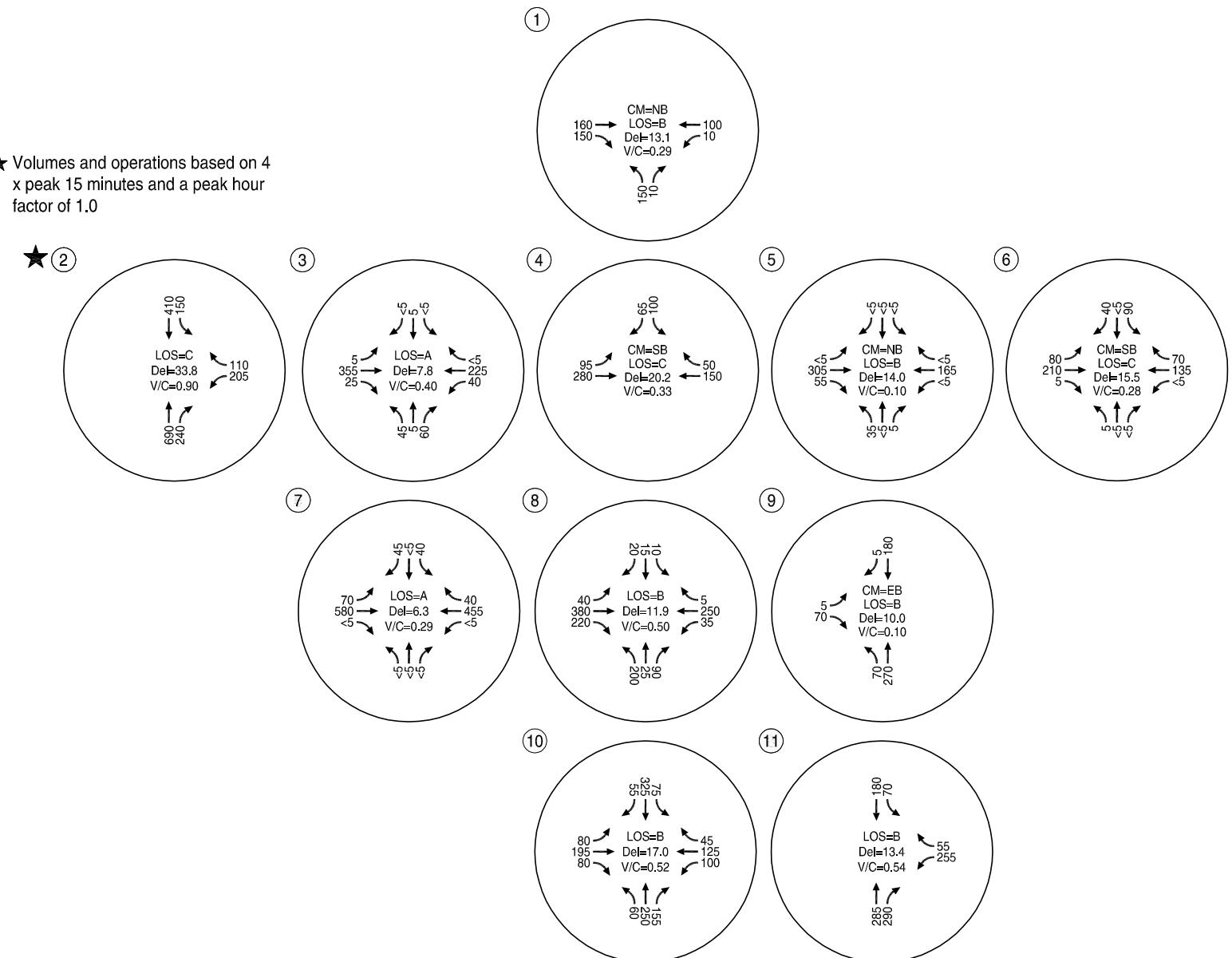
CM = CRITICAL MOVEMENT (TWSC)  
 LOS = INTERSECTION LEVEL OF SERVICE (SIG) / CRITICAL MOVEMENT  
 LEVEL OF SERVICE (TWSC)  
 Del = INTERSECTION AVERAGE CONTROL DELAY (SIG / CRITICAL  
 MOVEMENT CONTROL DELAY (TWSC))  
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO  
 TWSC = TWO-WAY STOP CONTROL

2018 Background Conditions  
Weekday AM Peak Hour  
Camas, Washington

Figure  
12



★ Volumes and operations based on 4 x peak 15 minutes and a peak hour factor of 1.0



CM = CRITICAL MOVEMENT (TWSC)  
LOS = INTERSECTION LEVEL OF SERVICE (SIG) / CRITICAL MOVEMENT  
LEVEL OF SERVICE (TWSC)  
Del = INTERSECTION AVERAGE CONTROL DELAY (SIG / CRITICAL  
MOVEMENT CONTROL DELAY (TWSC))  
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO  
TWSC = TWO-WAY STOP CONTROL

2018 Background Conditions  
Weekday PM Peak Hour  
Camas, Washington

Figure  
13

## 2018 Total Traffic Conditions

The year 2018 total traffic analysis forecasts how the study area's transportation system will operate with the addition of traffic from Phase 1 of the proposed development. Phase 1 site-generated trips were added to the 2018 background traffic volumes at the study intersections to arrive at the total traffic volumes.

All lane configurations are consistent with background conditions with the exception of the intersection of NE Ingle Road/NE Goodwin Road. The developer proposes to construct an exclusive eastbound left-turn lane on NE Goodwin Road at NE Ingle Road in conjunction with the Phase 1 site development. Consequently, provision of the turn lane was assumed for the total traffic analysis.

### **Traffic Operations**

Figures 14 and 15 summarize the year 2018 total traffic operations analysis results at the study intersections for the weekday a.m. and weekday p.m. peak-hours, respectively. The projected turning movement counts are rounded to the nearest five vehicles per hour. As shown, all but one of the study intersections are forecast to operate acceptably during the weekday a.m. and p.m. peak periods under 2018 total traffic conditions. The southbound movement at the intersection of NE Ingle Road/NE Goodwin Road is anticipated to operate at a LOS E during the weekday p.m. peak hour. Operations at this intersection could be mitigated with the addition of an eastbound right-turn lane. Based on a sensitivity analysis, this mitigation is triggered by the 203<sup>rd</sup> unit to be constructed. Up until this point, the southbound left-turn lane is forecast to operate at a LOS D. Table 6 provides the operations at NE Ingle Road/NE Goodwin Road during the weekday PM peak hour supporting the sensitivity analysis.

Table 6: NE Ingle Road/NE Goodwin Road Operations Assessment – weekday PM peak hour

Scenario	Critical Movement	LOS	v/c ratio
2018 Background Conditions	SBL	C	0.33
2018 Background + 200 Homes	SBL	D	0.52
2018 Background + 203 homes	SBL	E	0.53
2018 Total Traffic (215 homes)	SBL	E	0.53
2018 Total Traffic (2015 homes) – mitigated <sup>1</sup>	SBL	D	0.51

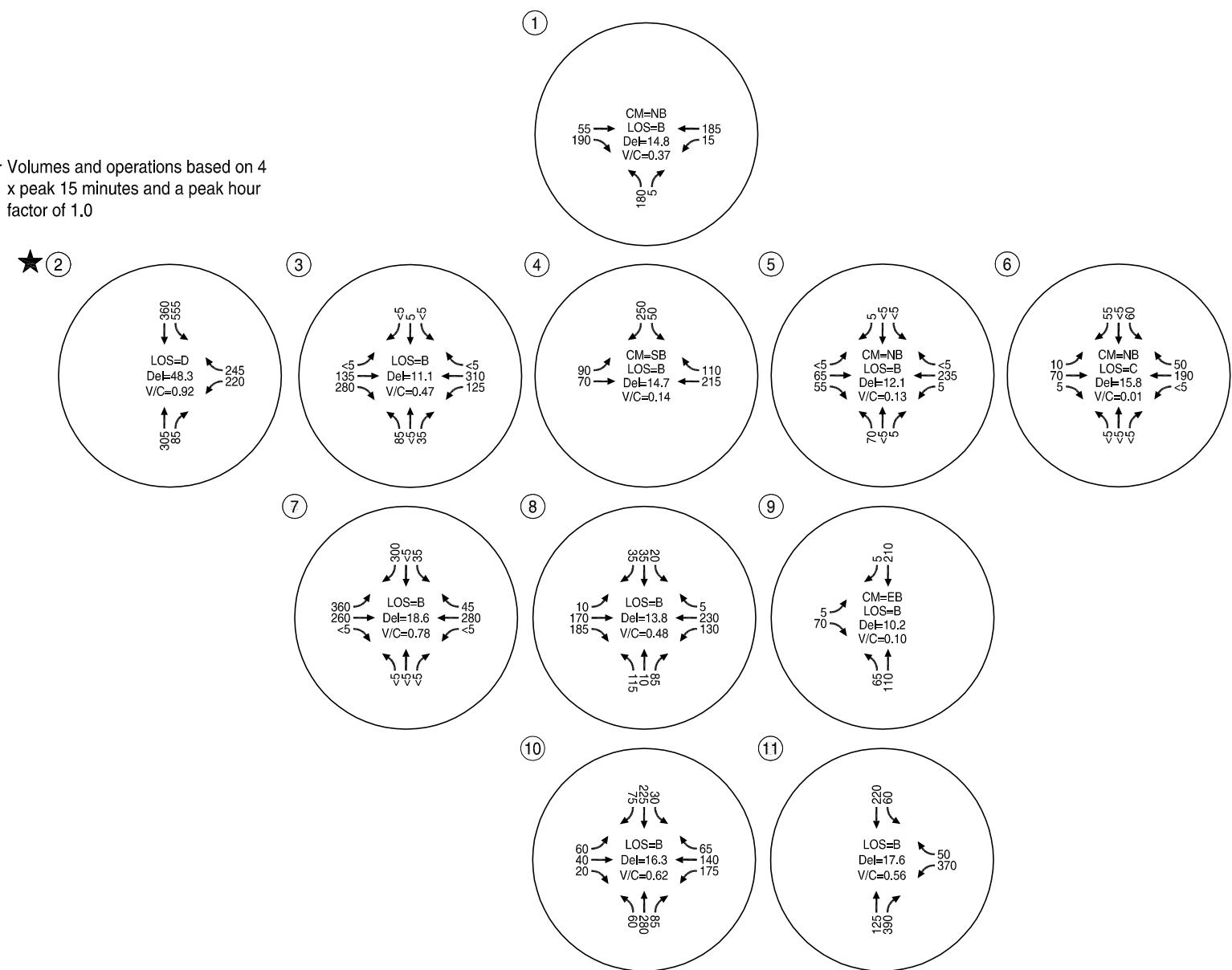
Notes: LOS = Level of Service; v/c ratio = volume-to-capacity ratio

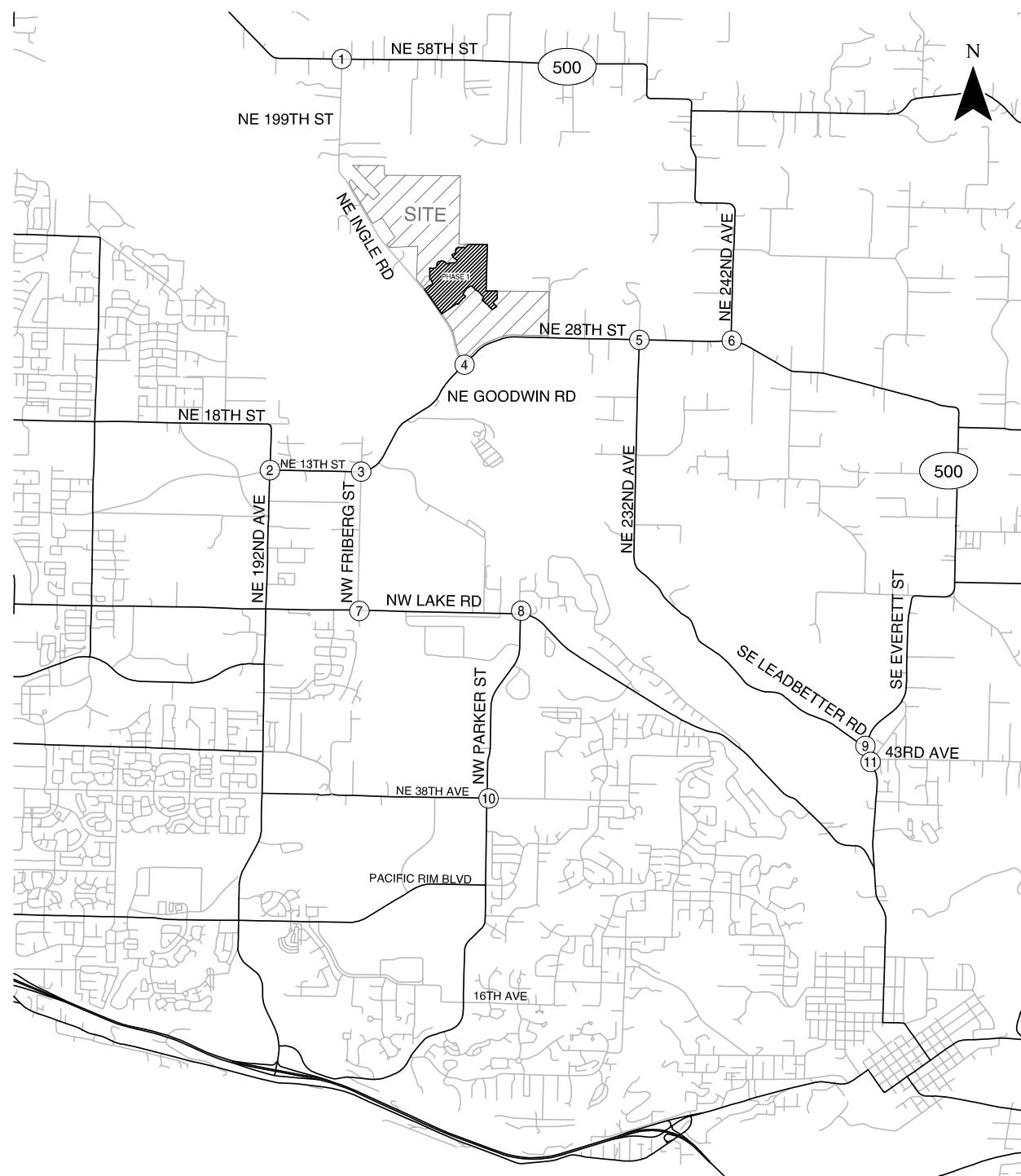
<sup>1</sup>Mitigation includes provision of westbound right-turn lane

*Appendix "H" contains the 2018 total traffic conditions traffic operations worksheets. Appendix "I" contains the traffic operations worksheets supporting the sensitivity analysis at NE Ingle Road/NE Goodwin Road.*

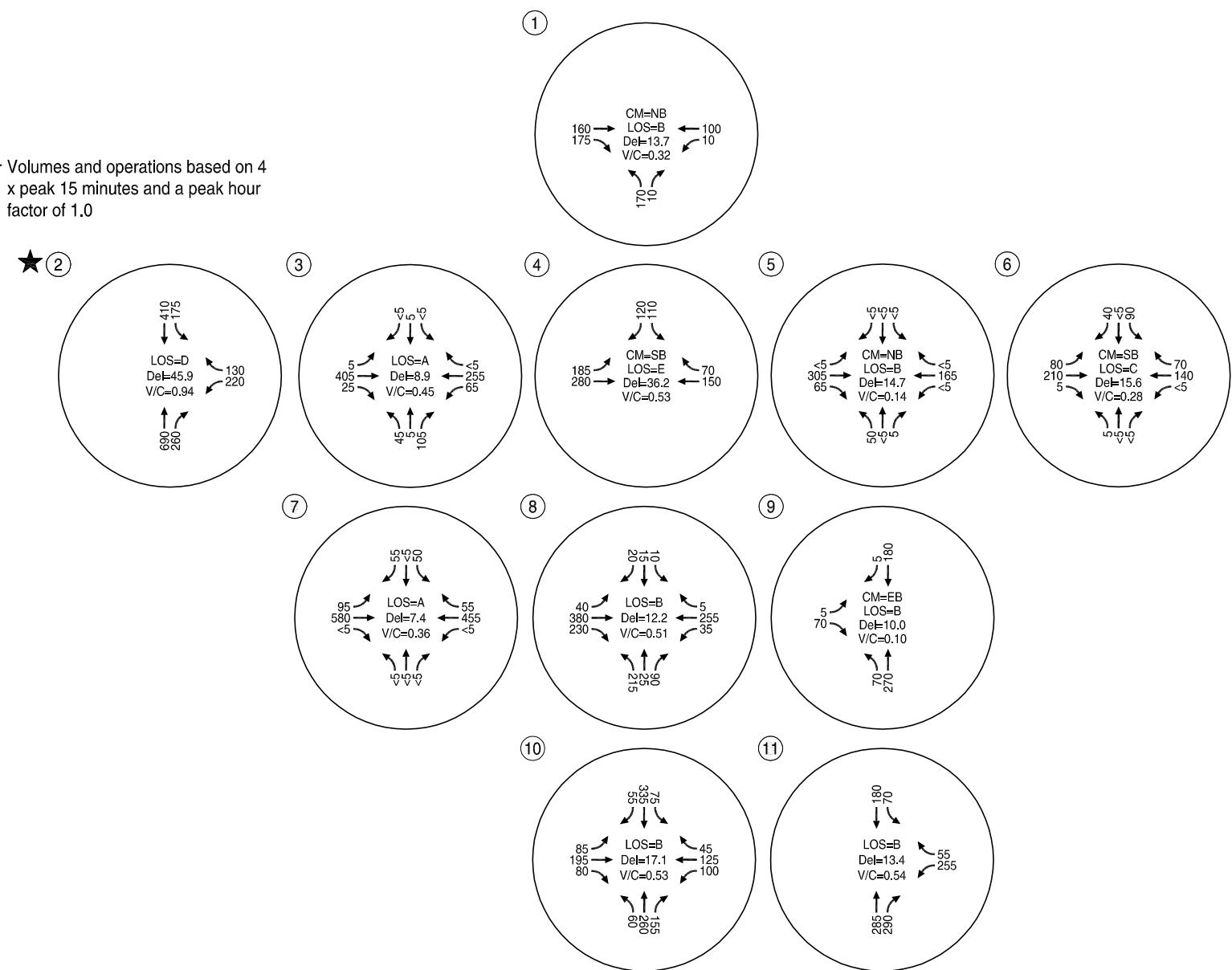


★ Volumes and operations based on 4 x peak 15 minutes and a peak hour factor of 1.0





★ Volumes and operations based on 4 x peak 15 minutes and a peak hour factor of 1.0



CM = CRITICAL MOVEMENT (TWSC)  
LOS = INTERSECTION LEVEL OF SERVICE (SIG) / CRITICAL MOVEMENT  
LEVEL OF SERVICE (TWSC)  
Del = INTERSECTION AVERAGE CONTROL DELAY (SIG / CRITICAL  
MOVEMENT CONTROL DELAY (TWSC))  
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO  
TWSC = TWO-WAY STOP CONTROL

2018 Total Traffic Conditions (Phase 1)  
Weekday PM Peak Hour  
Camas, Washington

Figure  
15

## 2029 Background Traffic Conditions

The 2029 background traffic analysis identifies how the study area's transportation system will operate with regional growth, including completion of Phase 1 development. No further funded transportation improvement projects were identified at the study intersections that would be in place prior to the year 2029. In addition to the previously described in-process development, a one percent annual growth rate was applied to the 2018 background traffic volumes on City of Camas roadways to account for regional growth in the area per staff direction. Continued use of a two percent annual growth rate was assumed to the City of Vancouver roadways (NE 192<sup>nd</sup> Avenue).

The same lane configurations used in the 2018 analysis were assumed, with the exception of the configuration at NE Ingle Road/NE Goodwin Road. As previously noted, the developer proposes to construct an exclusive eastbound left-turn lane at the intersection in conjunction with the Phase 1 site development so this turn lane was assumed for the 2029 analysis. Signal timings were optimized with the assumption that signals in the area will be re-timed in the next fifteen years. In addition, some peak hour factors (PHF) were increased to account for future traffic changes, including:

- PHF increased to 0.80 in the a.m. peak hour at NW Friberg Street/NE Goodwin Road and NE 242<sup>nd</sup> Avenue/NE 28<sup>th</sup> Street
- PHF increased to 0.75 in the a.m. peak hour at NW Friberg Street/NW Lake Road; NW Parker Street/NW Lake Road; and NW Parker Street/NE 38<sup>th</sup> Avenue

### *Traffic Operations*

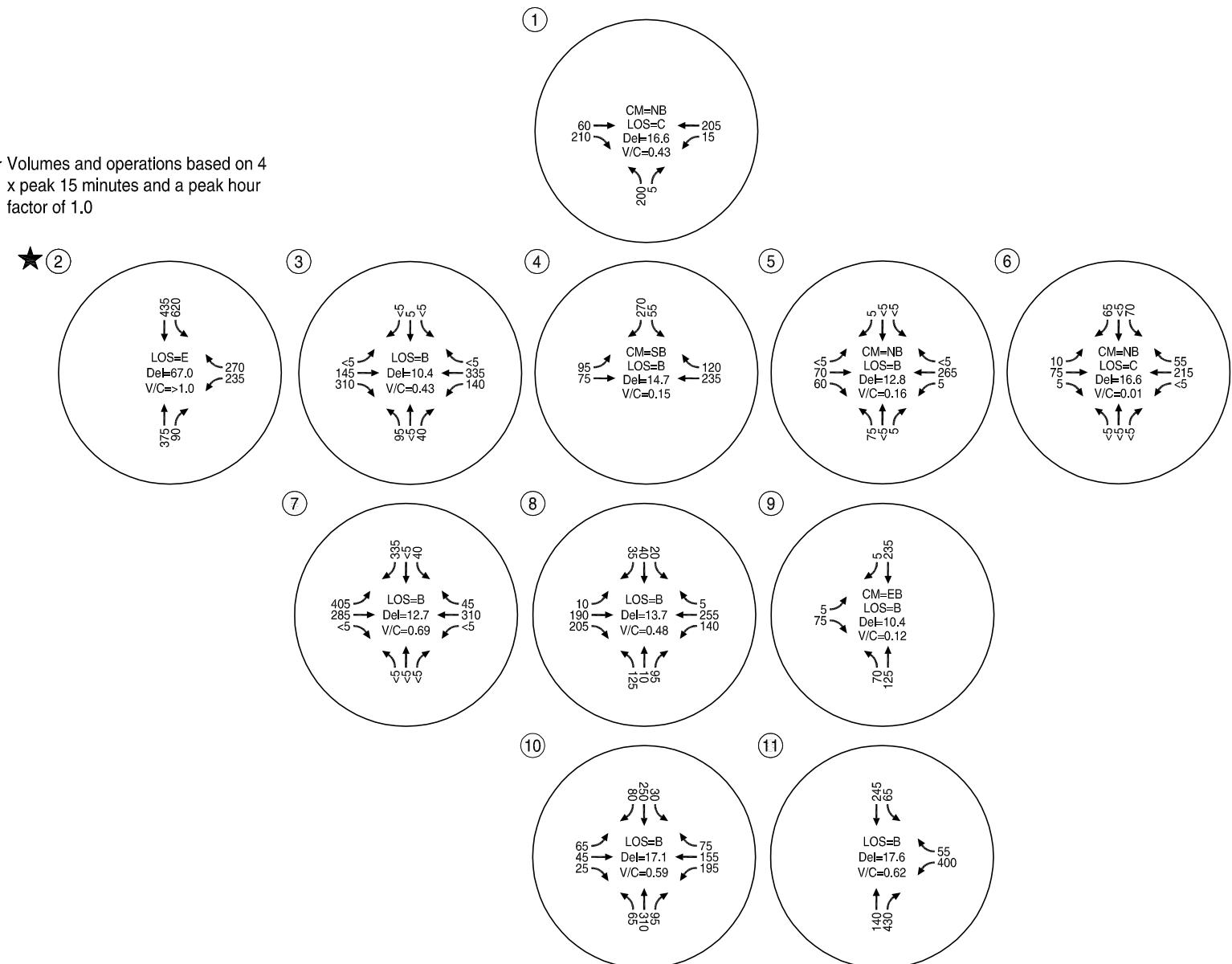
Figures 16 and 17 summarize the year 2029 background traffic operations analysis results at the study intersections for the weekday a.m. and weekday p.m. peak-hours, respectively. As illustrated in the figures, all but two of the study intersections are forecast to operate acceptably:

- The intersection of NE 192<sup>nd</sup> Avenue/NE 13<sup>th</sup> Street is projected to operate at a LOS E and over-capacity during the weekday a.m. peak hour and LOS F and over-capacity during the p.m. peak hour.
- The southbound approach to the intersection of NE Ingle Road/NE Goodwin Road is projected to operate at a LOS E during the weekday p.m. peak hour (with provision of the westbound right-turn lane recommended in conjunction with Phase 1 site development).

*Appendix "J" contains the 2029 background conditions traffic operations worksheets.*



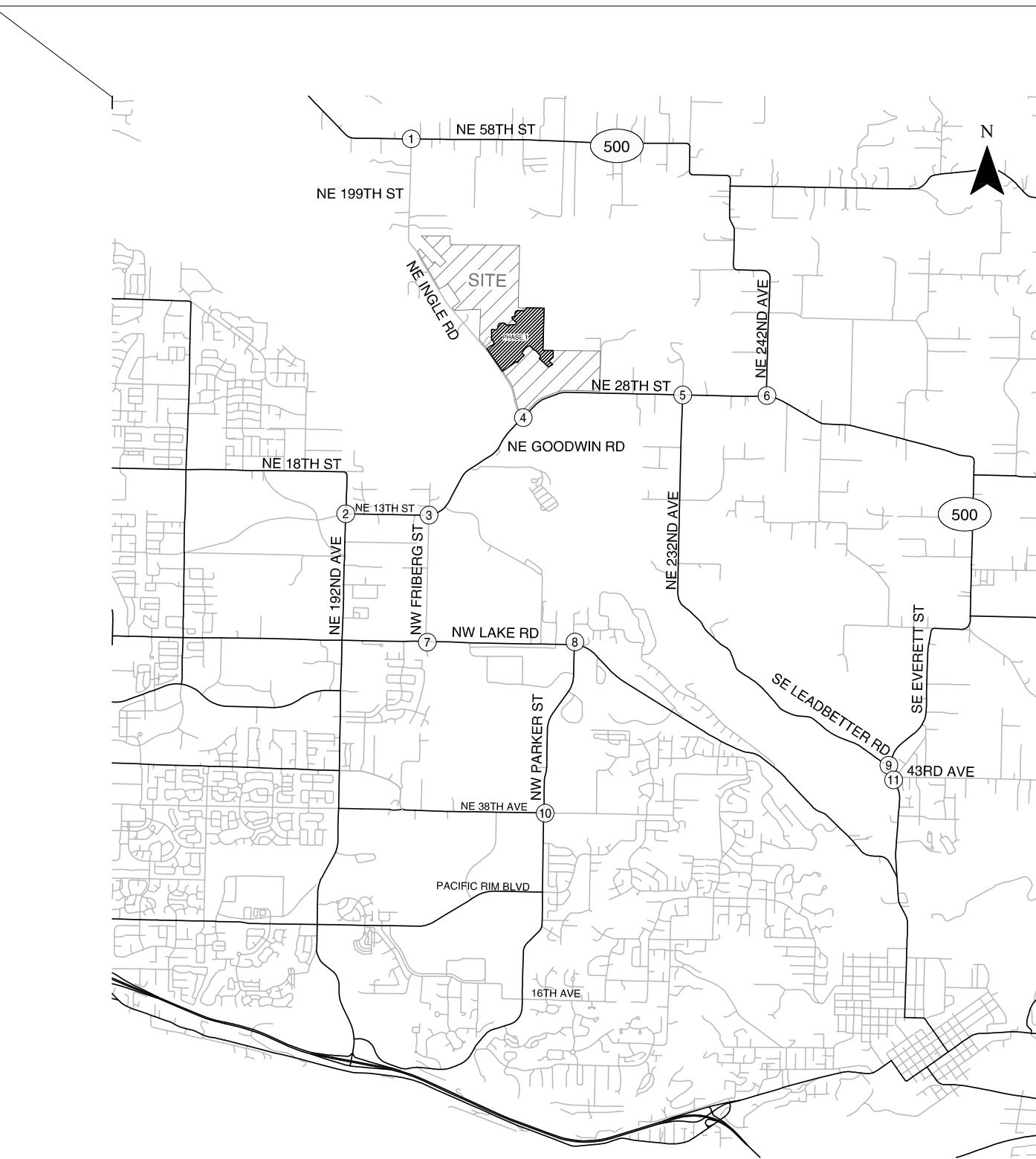
★ Volumes and operations based on 4 x peak 15 minutes and a peak hour factor of 1.0



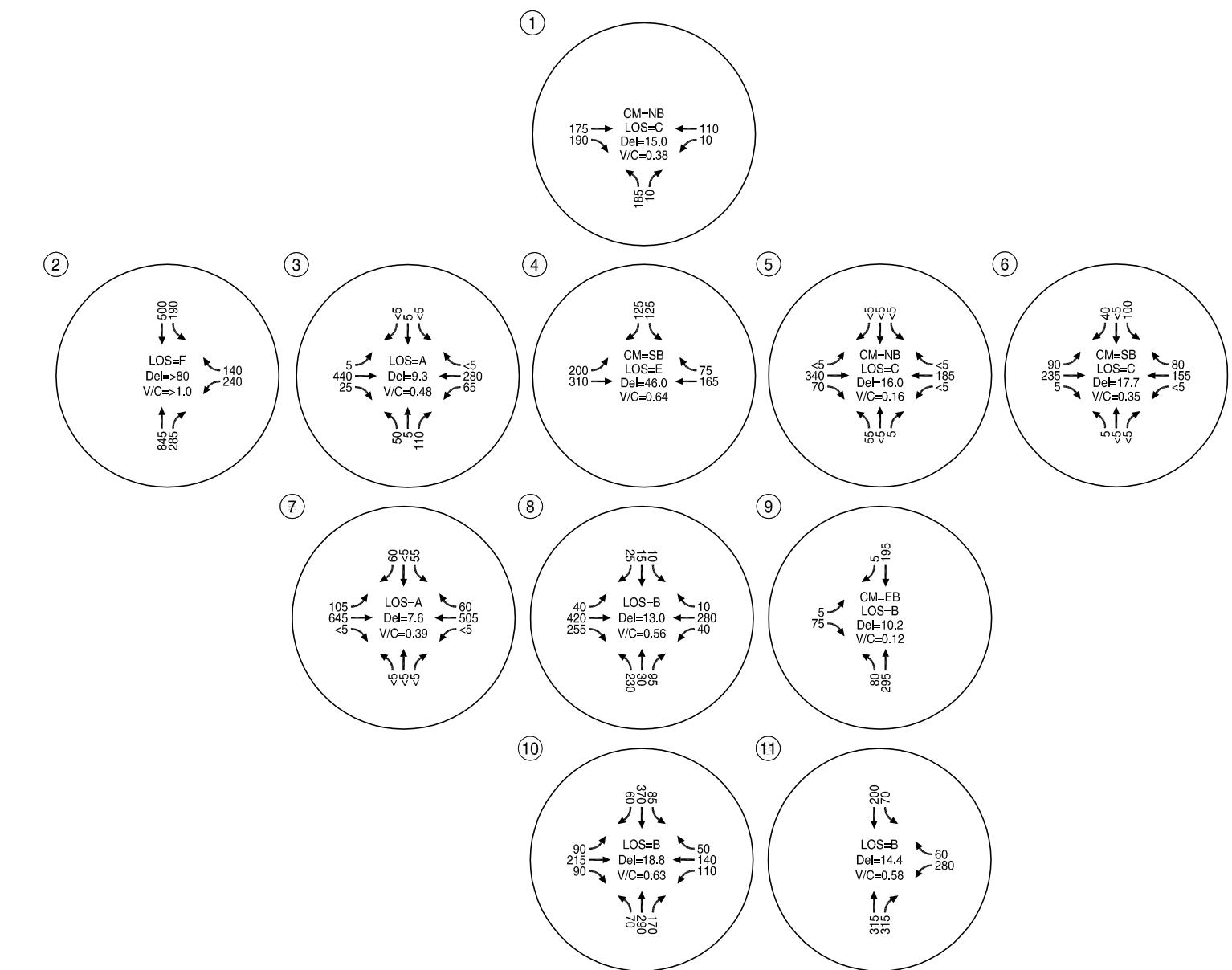
CM = CRITICAL MOVEMENT (TWSC)  
 LOS = INTERSECTION LEVEL OF SERVICE (SIG) / CRITICAL MOVEMENT  
 LEVEL OF SERVICE (TWSC)  
 Del = INTERSECTION AVERAGE CONTROL DELAY (SIG / CRITICAL  
 MOVEMENT CONTROL DELAY (TWSC))  
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO  
 TWSC = TWO-WAY STOP CONTROL

2029 Background Conditions  
 Weekday AM Peak Hour  
 Camas, Washington

Figure  
**16**



CM = CRITICAL MOVEMENT (TWSC)  
 LOS = INTERSECTION LEVEL OF SERVICE (SIG) / CRITICAL MOVEMENT  
 LEVEL OF SERVICE (TWSC)  
 Del = INTERSECTION AVERAGE CONTROL DELAY (SIG / CRITICAL  
 MOVEMENT CONTROL DELAY (TWSC))  
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO  
 TWSC = TWO-WAY STOP CONTROL



2029 Background Conditions  
Weekday PM Peak Hour  
Camas, Washington

Figure  
17

## 2029 Total Traffic Conditions

The year 2029 total traffic analysis forecasts how the study area's transportation system will operate with full build-out of the proposed master plan development. The year 2029 background traffic volumes were added to the full build-out site-generated traffic to arrive at the total traffic volumes.

### *Traffic Operations*

Figures 18 and 19 summarize the year 2029 total traffic operations analysis results at the study intersections for the weekday a.m. and weekday p.m. peak-hours, respectively. The projected turning movement counts are rounded to the nearest five vehicles per hour. As shown, the following study intersections do not meet standards during either the weekday a.m. or p.m. peak periods:

- NE 199<sup>th</sup> Avenue/NE 58<sup>th</sup> Street (SR 500) (weekday a.m. and p.m. peak hours)
- NE 192<sup>nd</sup> Avenue/NE 13<sup>th</sup> Street (weekday a.m. and p.m. peak hours, previously was failing during background a.m. and p.m. peak hours)
- NE Ingle Road/NE Goodwin Road (weekday a.m. and p.m. peak hours, previously was failing during background p.m. peak hour)

Potential mitigation measures for these intersections are discussed later in the report.

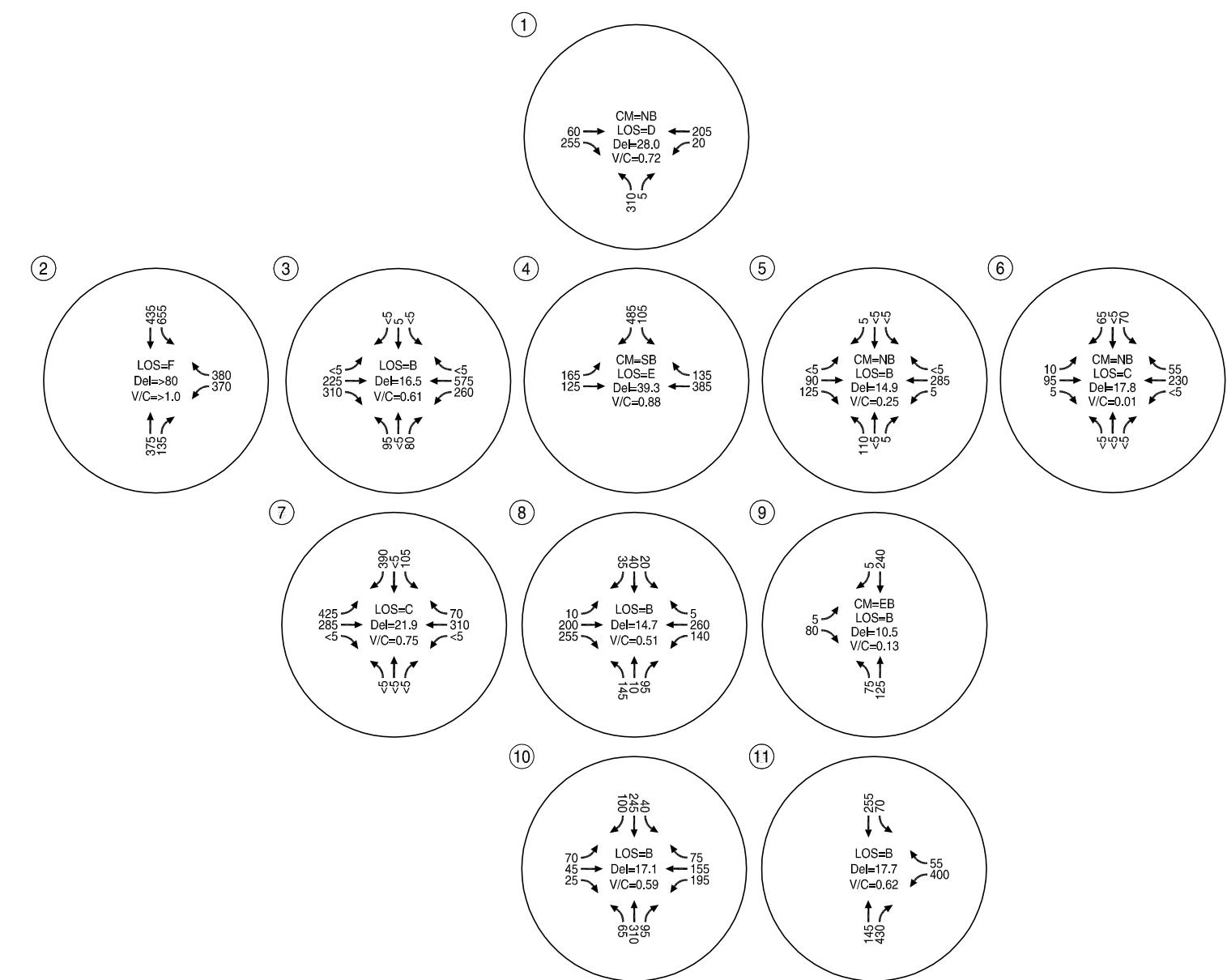
*Appendix "K" contains the 2029 total traffic conditions traffic operations worksheets.*

### Turn-Lane Considerations

As referenced under the "Analysis Methodology," roadways under Washington State jurisdiction are subject to the turn lane guidelines contained in the *WSDOT Design Manual* (Reference 3). The potential need for turn-lanes at each study intersection was reviewed for the analysis scenarios. Intersections that meet turn-lane guidelines are further discussed below.

#### **NE 199<sup>th</sup> Avenue/NE 58<sup>th</sup> Street (SR 500)**

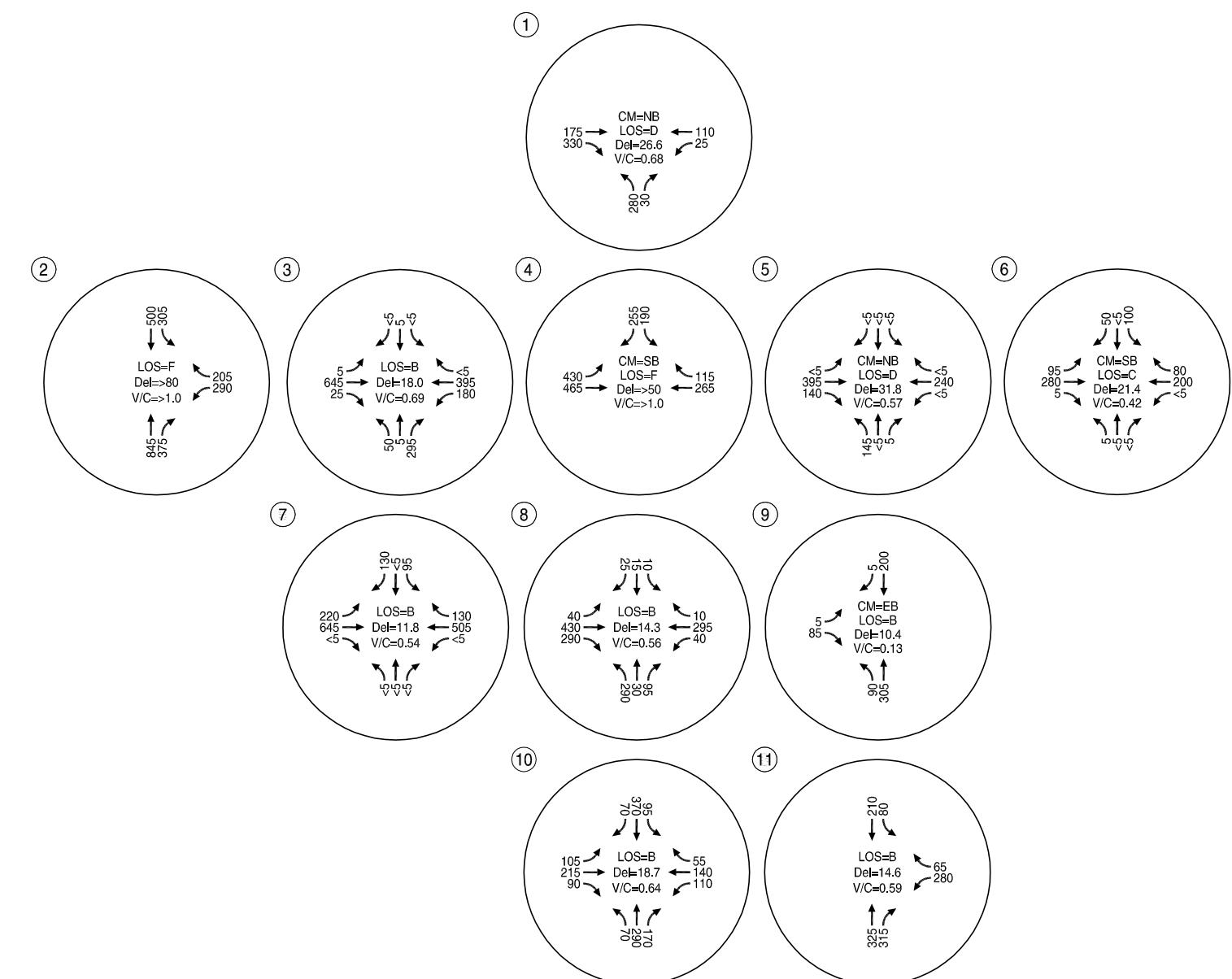
Traffic volumes at the intersection of NE 199<sup>th</sup> Avenue/NE 58<sup>th</sup> Street (SR 500) meet WSDOT's guidelines for an eastbound right-turn lane on NE 58<sup>th</sup> Street under existing conditions and all future scenarios during both the weekday a.m. and p.m. peak hour. Construction of a right-turn lane could require right-of-way acquisition and will likely impact one or more private driveways along NE 58<sup>th</sup> Street (depending on the length of the deceleration lane constructed).



CM = CRITICAL MOVEMENT (TWSC)  
 LOS = INTERSECTION LEVEL OF SERVICE (SIG) / CRITICAL MOVEMENT  
 LEVEL OF SERVICE (TWSC)  
 Del = INTERSECTION AVERAGE CONTROL DELAY (SIG / CRITICAL  
 MOVEMENT CONTROL DELAY (TWSC))  
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO  
 TWSC = TWO-WAY STOP CONTROL

2029 Total Traffic Conditions (Build Out)  
Weekday AM Peak Hour  
Camas, Washington

Figure  
18



CM = CRITICAL MOVEMENT (TWSC)  
 LOS = INTERSECTION LEVEL OF SERVICE (SIG) / CRITICAL MOVEMENT  
 LEVEL OF SERVICE (TWSC)  
 Del = INTERSECTION AVERAGE CONTROL DELAY (SIG / CRITICAL  
 MOVEMENT CONTROL DELAY (TWSC))  
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO  
 TWSC = TWO-WAY STOP CONTROL

2029 Total Traffic Conditions (Build Out)  
Weekday PM Peak Hour  
Camas, Washington

Figure  
19

The table below assesses volumes at the intersection for various horizon year scenarios and the impact of the proposed development.

Table 7: NE 199<sup>th</sup> Avenue/NE 58<sup>th</sup> Street (SR 500) Eastbound Right-Turn Lane Assessment

Scenario	Eastbound Right-Turn (EBRT) Volume	Meets Guideline?	Development-Added EBRT Trips	Impact of Development
2014 Existing Traffic – AM Peak	180	Yes	-	-
2014 Existing Traffic – PM Peak	145	Yes	-	-
2018 Background Traffic – AM Peak	180	Yes	8 (Phase 1)	4%
2018 Background Traffic – PM Peak	150	Yes	27 (Phase 1)	18%
2029 Background Traffic – AM Peak	210	Yes	45 (Build-out)	21%
2029 Background Traffic – PM Peak	190	Yes	138 (Build-out)	73%

The recorded crash history at the intersection was reviewed to identify potential safety issues that an eastbound right-turn lane might address. No crashes were reported involving vehicles making an eastbound right-turn. Given the lack of crash history and the relatively small impact of Phase 1, no improvements are recommended in conjunction with Phase 1. Nonetheless, given the amount of site-generated traffic that will be added to the eastbound right-turn movement as future phases of the master plan build-out, if right turn crashes materially increased, it is possible that a nexus could be established between requiring construction of an eastbound right-turn lane and traffic volume increases attributable to master plan trip development. Accordingly, we recommend that future site plan applications prepared subsequent to Phase 1 provide an updated assessment as to the potential need for providing a right-turn taper or lane at the intersection.

#### **NE 242<sup>nd</sup> Avenue (SR 500)/NE 28<sup>th</sup> Street**

Traffic volumes at the intersection of NE 242<sup>nd</sup> Avenue (SR 500)/NE 28<sup>th</sup> Street meet WSDOT's guidelines for a left-turn lane on the eastbound approach under existing conditions and all future scenarios during the weekday p.m. peak hour. The table below assesses volumes at the intersection for each horizon year scenario and the impact of the proposed development. *As shown in the table, the Phase 1 development does not add any trips to the eastbound left-turn lane.* The trips generated by build-out of the master plan development are from the retail component and total less than 10.

Table 8: NE 242<sup>nd</sup> Avenue (SR 500)/NE 28<sup>th</sup> Street Eastbound Left-Turn Lane Assessment

Scenario	Eastbound Left-Turn Volume	Meets Guidelines? (Recommended Storage)	Development-Added Trips	Impact of Development
2014 Existing Traffic – AM Peak	10	No	-	-
2014 Existing Traffic – PM Peak	80	Yes (100 feet)	-	-
2018 Background Traffic – AM Peak	10	No	0 (Phase 1)	0%
2018 Background Traffic – PM Peak	80	Yes (100 feet)	0 (Phase 1)	0%
2029 Background Traffic – AM Peak	10	No	2 (Build-out)	20%
2029 Background Traffic – PM Peak	90	Yes (100 feet)	9 (Build-out)	10%

The recorded crash history at the intersection was reviewed to identify potential safety issues that an eastbound left-turn lane might address. While two angle crashes were reported from vehicles making a southbound left-turn, no crashes were reported involving vehicles making an eastbound left-turn.

Based on our review of the information provided above, we find no basis for recommending improvements to the NE 242<sup>nd</sup> Avenue (SR 500)/NE 28<sup>th</sup> Street intersection in conjunction with Phase 1 site development. We base this conclusion on the proposed development adding no trips to the left-turn movement in question, the lack of crash history related to left-turns, and the general lack of a nexus given the small trip impact of the proposed Phase 1 development at this location.

#### *Planned Future Intersection Improvements*

The *2012 City of Camas Traffic Impact Fee Update Report* (Reference 2) identifies the future need to widen NE 28<sup>th</sup> Street to have a center left-turn lane from Ingle Road to NE 242<sup>nd</sup> Avenue. A related project would create a new NE 242<sup>nd</sup> Avenue extension south of NE 28<sup>th</sup> Street. Given the City's planned improvements, we recommend the City of Camas make a finding that the traffic impact fee payments made by the master plan for Phase 1 and future phases of the project mitigate development impacts at the intersection, and therefore require no additional mitigation.

#### **Recommended Mitigations**

As discussed above, all study intersections meet operating standards under existing and 2018 background and total traffic conditions for both the weekday a.m. and p.m. peak hours. Four intersections do not meet operating standards in 2029 under background and/or total traffic conditions; each is discussed below.

### **NE 199<sup>th</sup> Avenue/NE 58<sup>th</sup> Street (SR 500)**

The minor street northbound left-turn at the intersection of NE 199<sup>th</sup> Avenue/NE 58<sup>th</sup> Street (SR 500) is projected to not meet current WSDOT standards in the 2029 total traffic conditions during the weekday a.m. and p.m. peak hours. The intersection is projected to operate at a volume-to-capacity (v/c) ratio of 0.72 and LOS D during the a.m. peak hour and v/c ratio of 0.70 and LOS D during the p.m. peak hour. It is therefore not within WSDOT's LOS requirement (LOS C) for non-HSS facilities in rural areas. The intersection is three-legged and stop-controlled on the northbound approach. The northbound left-turn is the critical movement at the intersection, with all other movements operating at a LOS A and well under capacity. During both the weekday a.m. and p.m. peak hours, the northbound left-turn is 3 seconds or less over the delay threshold between LOS C and LOS D. In the event that the area around the intersection urbanizes before build-out, the WSDOT performance standard will shift to LOS E and the intersection would operate within WSDOT standards.

As discussed in the *Turn-Lane Considerations* section above, the intersection currently meets warrants for an eastbound right-turn lane, which would improve operations for northbound left-turning vehicles to a LOS C during the 2029 total traffic conditions. As also discussed above, it is expected that a nexus might ultimately be established between requiring construction of an eastbound right-turn lane and traffic volume increases attributable to master plan trip development, based on LOS and delay at the intersection. Accordingly, we recommend that future site plan applications prepared subsequent to Phase 1 provide an updated assessment as to the potential need for providing a right-turn taper or lane at the intersection, considering both the need for a right-turn taper or lane and delay with the northbound left-turn.

*Appendix "L" contains the traffic operations worksheets supporting the potential mitigations at NE 199<sup>th</sup> Avenue/NE 58<sup>th</sup> Street (SR 500).*

### **NE 192<sup>nd</sup> Avenue/NE 13<sup>th</sup> Street**

The intersection of NE 192<sup>nd</sup> Avenue/NE 13<sup>th</sup> Street is projected to not meet standards in the 2029 background conditions and the 2029 total traffic conditions during both the weekday a.m. and p.m. peak hours. The intersection operates over-capacity in all four of these scenarios and at a LOS F during the weekday p.m. peak hour in the background conditions and weekday a.m. and p.m. peak hours in the total traffic scenarios.

#### *Potential Future City of Vancouver Improvements*

The City of Vancouver has identified NE 192<sup>nd</sup> Avenue as ultimately requiring five travel lanes (two southbound through lanes, a center left-turn lane, and two northbound through lanes) and includes

the widening on the City's Traffic Impact Fee (TIF) program project list. Because no near-term funding has been programmed for the future five-lane section, the existing section was assumed to be in place in 2029 for the purposes of this traffic study. Widening by the City of Vancouver or others in the interim would add capacity and change the intersection operations.

In the event that NE 192<sup>nd</sup> Avenue is widened to five lanes through the NE 13<sup>th</sup> Street intersection, the intersection is projected to meet City of Vancouver intersection operating standards under 2029 background conditions. To mitigate total traffic conditions, a westbound right-turn lane would also be required. In the event that 192<sup>nd</sup> Avenue is not widened, a northbound right-turn lane and westbound right-turn lane would be sufficient to mitigate 2029 total traffic conditions (mitigation assumes maintaining operations equivalent to or better than those experienced under 2029 background conditions with site build-out but does not fully accommodate forecast queuing).

#### *Potential Master Plan Development Mitigation Options*

As noted above, the provision of a northbound right-turn lane and westbound right-turn lane would offer more than sufficient capacity to mitigate the impact of the master plan site build-out while also providing additional capacity to allow for future growth and development. Therefore, we recommend the Green Mountain Master Plan provide a proportionate share contribution towards the construction of a northbound right-turn lane and a westbound right-turn lane on NE 13<sup>th</sup> Avenue. The City of Vancouver has successfully administered pro-rata share contribution collection systems at other intersections, allowing each development impacting a failing intersection to contribute a "fair-share" of the mitigation cost.

*Appendix "M" identifies a proposed proportionate cost sharing methodology. Under this methodology, each trip would be assessed a fee of \$391. Therefore the Green Mountain development contribution at full build-out would be approximately \$123,600. Details of the cost estimate, capacity generated by the improvements, and impact of the proposed development supporting the proportionate share calculations are provided in Appendix "M."*

It should be noted that the NE 192<sup>nd</sup> Avenue/NE 13<sup>th</sup> Street intersection is listed on the City of Vancouver's TIF program project list. In the case of the Green Mountain Master plan, any TIF credits issued by the City of Vancouver would only be redeemable for development impacts in Vancouver (not Camas).

#### *NE Ingle Road/NE Goodwin Road*

The intersection of NE Ingle Road/NE Goodwin Road is projected to not meet City of Camas intersection operating standards in the 2029 background conditions during the weekday p.m. peak

hour and the 2029 total traffic conditions during both the weekday a.m. and p.m. peak hours. In order to mitigate 2029 background conditions, a two-way left-turn lane could potentially be provided east of the intersection to facilitate southbound left-turns, which are the critical movement at the intersection.

The City's long-term plans anticipate significant reconstruction of the intersection and the approaching roadways as recorded in the 2012 *City of Camas Traffic Impact Fee Update* (Reference 2). Identified improvement needs include:

- Installation of a traffic signal at NE Ingle Road/NE Goodwin Road;
- The extension of a new collector roadway from NE Ingle Road south to NE 232<sup>nd</sup> Avenue;
- Widening of NE Goodwin Road from two to three lanes between NE Ingle Road and NE 232<sup>nd</sup> Avenue; and
- Widening of NE Goodwin Road from two to five lanes NE between Friberg Street and NE Ingle Road.

Considering the Green Mountain Master Plan project location and traffic impacts at the intersection, we recommend the following series of mitigations in conjunction with the proposed development:

- Construct an eastbound left-turn lane on NE Goodwin Road at NE Ingle Road with the first Phase 1 trip.
- Construct a westbound right-turn lane on NE Goodwin Road at NE Ingle Road with the 203<sup>rd</sup> Phase 1 trip (prior to occupancy of 203<sup>rd</sup> single family home on site). The right-turn lane should provide at least 100 feet of storage. (Note, in the long-term future, the City could consider restriping the right-turn lane to a shared through/right lane when widening of NE Goodwin Road west of NE Ingle Road develops two westbound receiving lanes).
- Construct a three-lane roadway section (with center two-way left-turn lane) on NE Goodwin Road along the site frontage in conjunction with standard frontage improvements as adjacent development occurs.
- Upon completion of Phase 1 site development (including construction of the eastbound left-turn lane and westbound right-turn lane on NE Goodwin Road at NE Ingle Road with Phase 1), the developer shall monitor the need for installation of a traffic signal with each future site plan application at the intersection and construct a traffic signal when the intersection no longer satisfies City of Camas performance standard (LOS "D" and v/c of 0.90 or better) *and* the intersection volumes meet traffic signal warrants (subject to direction from the City of Camas).

- The monitoring effort is recommended to require preparation of then-current traffic counts, assessment of traffic signal warrants based on build-out of the then-current site plan application (and all other approved development), and a summary report prepared by a licensed professional engineer. The study should consider potential turn movement re-routing that is expected to occur at the NE Goodwin Road/NE Ingle Road intersection as new connections to the master plan site are made to NE Goodwin Road east of NE Ingle Road.

## On-site Circulation and Operations

We recommend that a detailed review of on-site circulation and operations be prepared in conjunction with each future site plan application. This review will provide an opportunity to consider site-specific details when they become available and should include consideration of vehicular, pedestrian, and delivery vehicle paths.

On-site landscaping, signage and any above-ground utilities should be provided appropriately to ensure that adequate sight distance is provided and maintained and should be considered as part of future site plan applications.

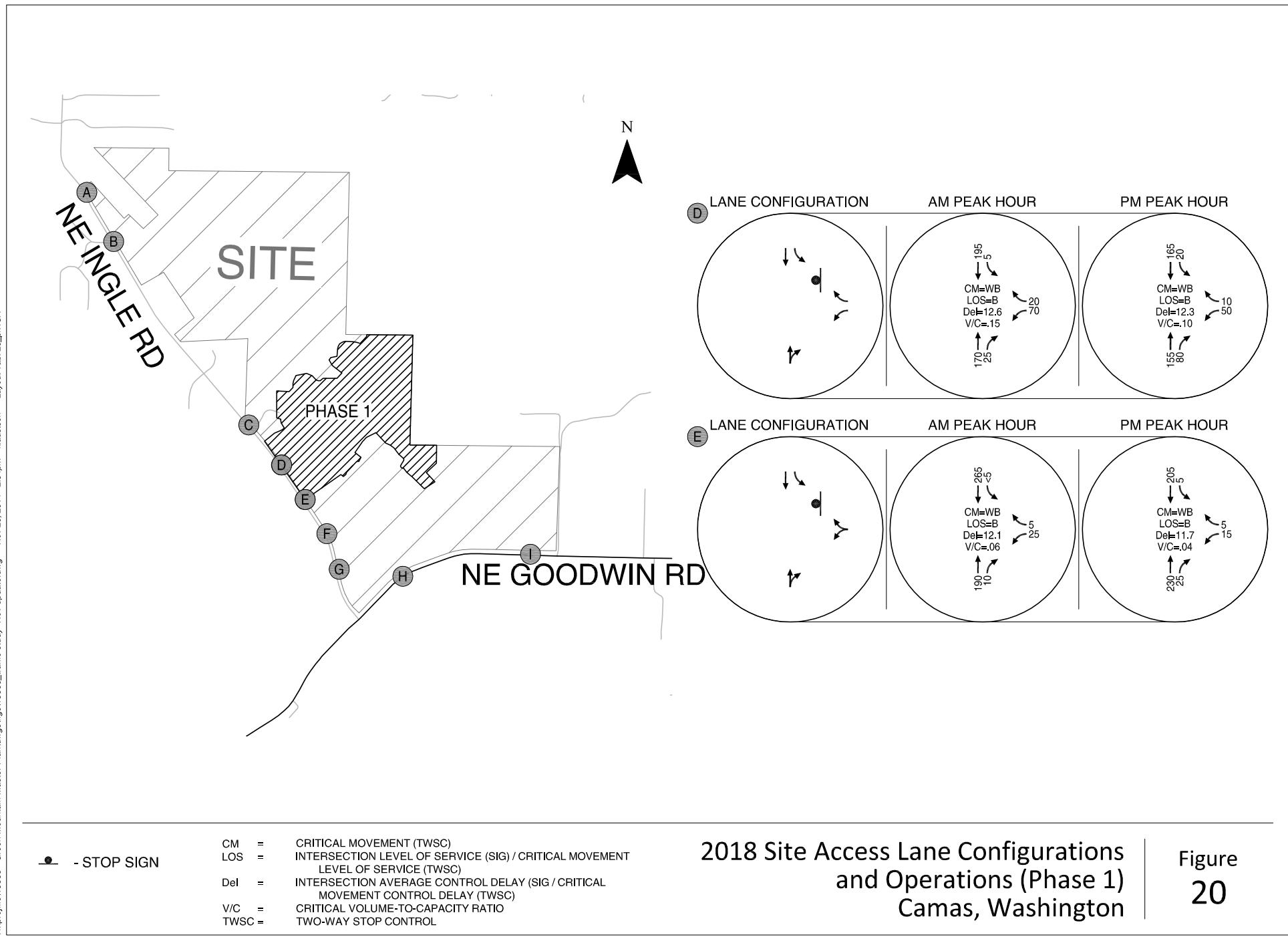
## ***Access Requirements***

The City of Camas requires a minimum intersection spacing of 330 feet on three lane collector streets. This spacing should be maintained with the proposed development.

## ***Phase 1 Access Operations***

The portion of the site that will be developed with Phase 1 is noted in Figure 2. As seen, two access points are proposed for the Phase 1 development. The proposed lane configuration at these accesses and operations is shown in Figure 20. The developer has proposed to maintain access to the existing golf course in conjunction with the Phase 1 development. The existing gravel maintenance only access will be improved to provide an interim main access to the remaining portion of the golf course (reduced to eight holes). The proposed interim golf course access is located approximately 400 feet south of the proposed southern access, which meets the City's intersection spacing requirements for a collector street noted above.

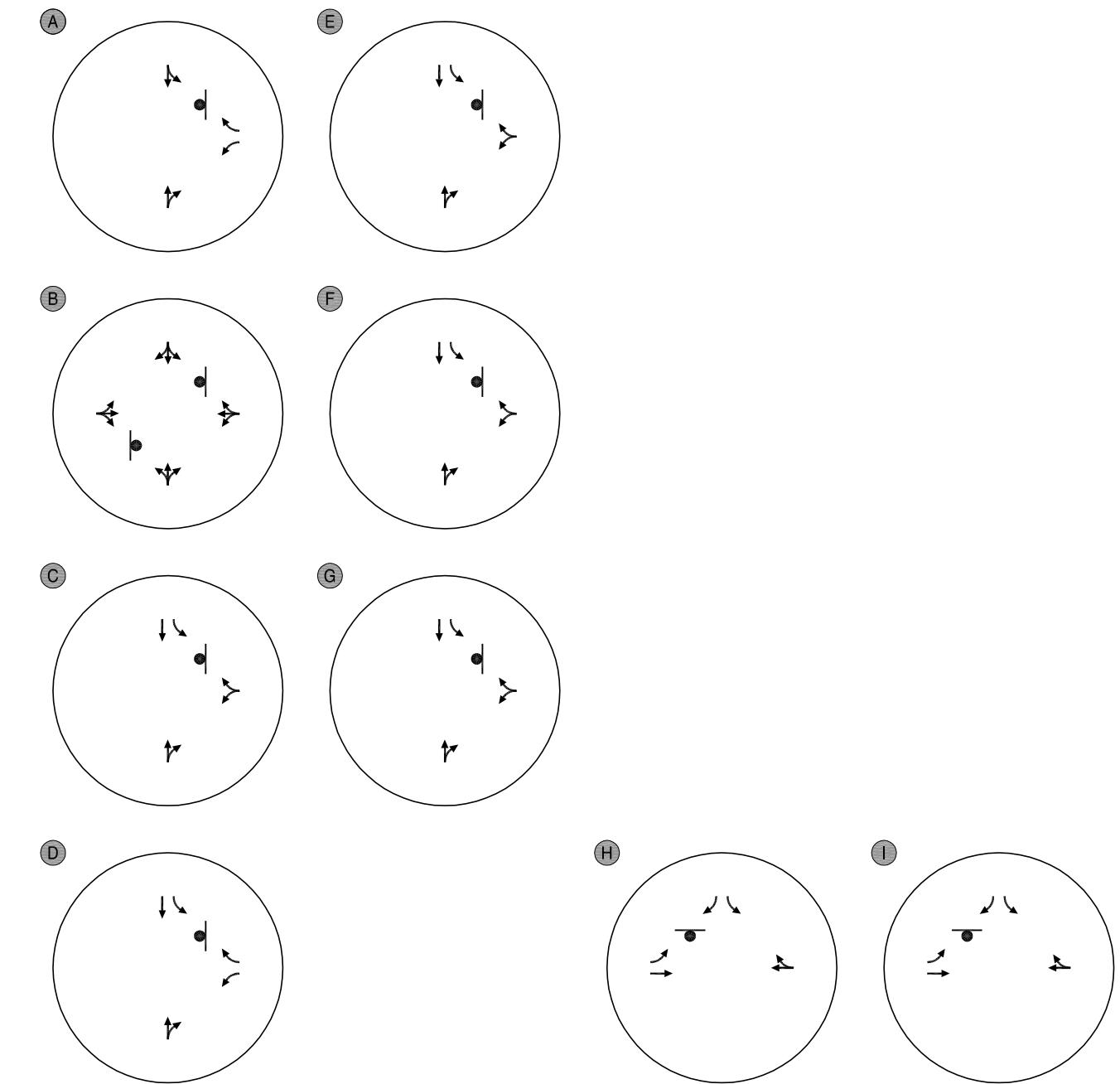
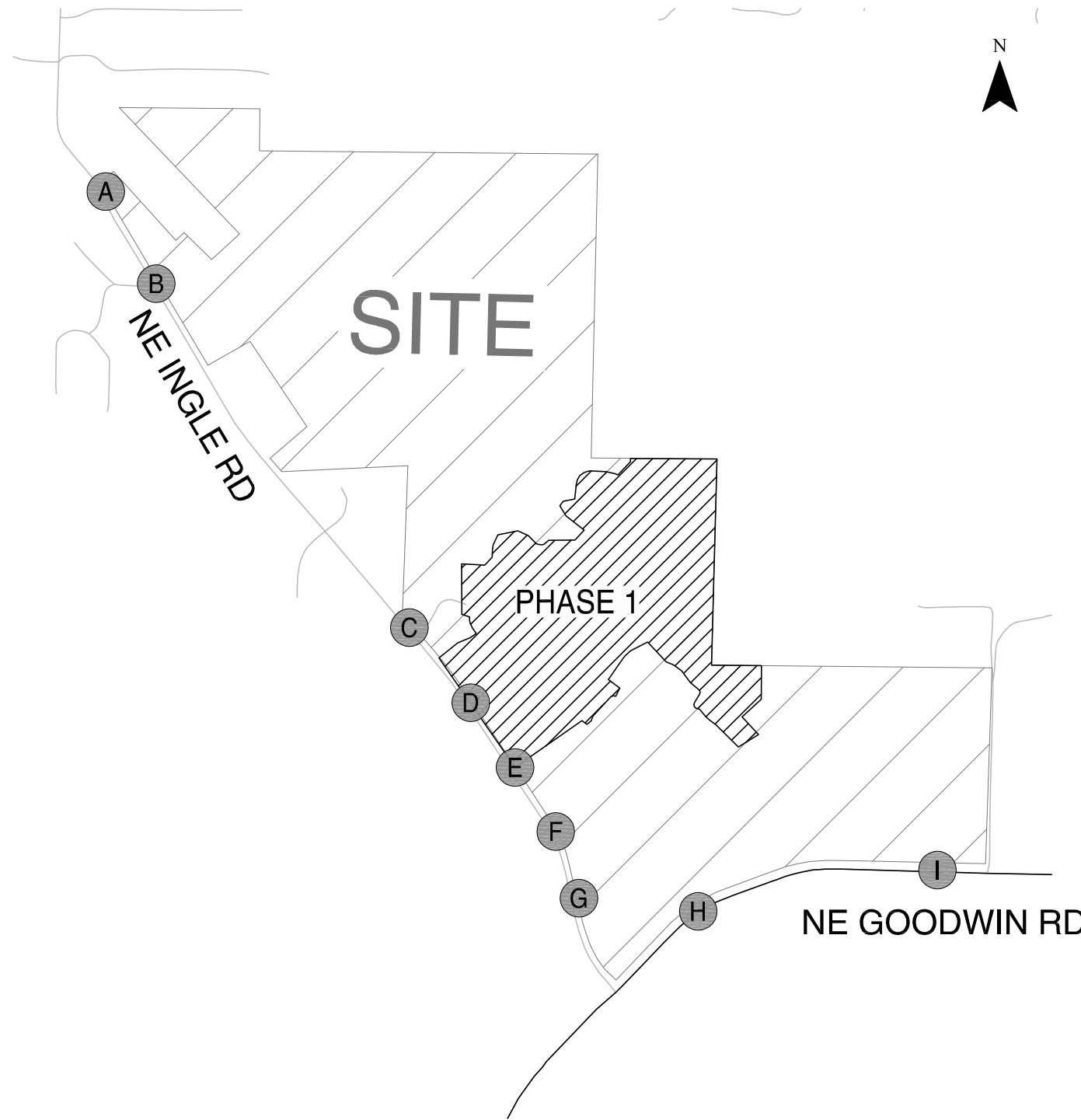
*Appendix "N" contains the traffic operations worksheets for the Phase 1 access operations.*



### ***Build-out Access Operations***

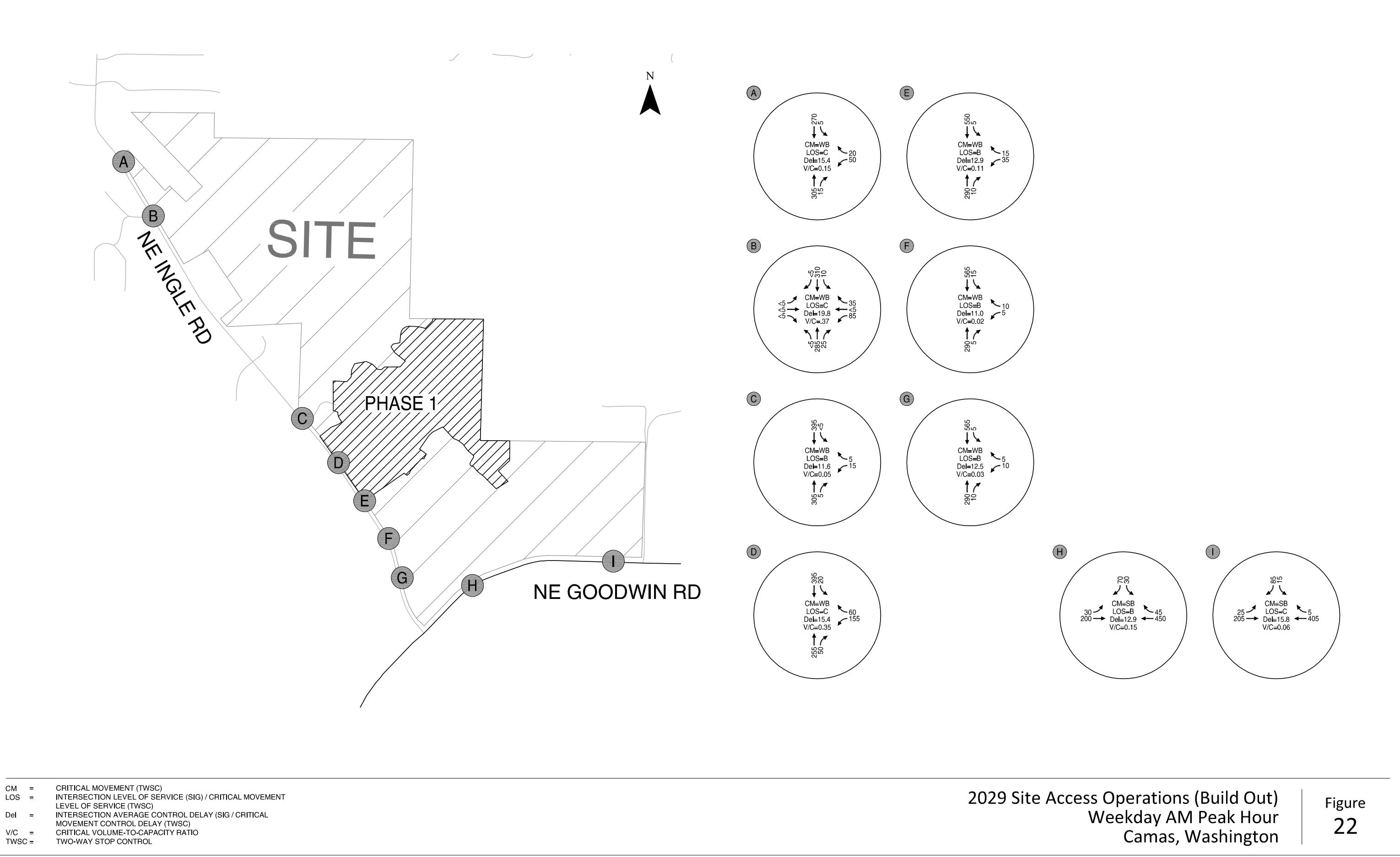
An additional five access points on NE Ingle Road and two access points on NE Goodwin Road are anticipated with full build-out of the development. The exact location of the access points may change as the plans for the development are refined. We assessed operations at these access points assuming the lane configuration shown in Figure 21. As seen in the figure, we expect NE Ingle Road will be developed with a center two-way left-turn lane (TWLTL) through access "C" and NE Goodwin Road will be developed with a TWLTL along the site frontage. Operations at the site accesses for the weekday a.m. and p.m. peak hours are shown in Figures 22 and 23. As seen in the figures, all access points operate at a LOS "C" or better, with the exception of the eastern access on NE Goodwin Road. The southbound left-turn movement at this intersection operates at a LOS D during the weekday p.m. peak hour.

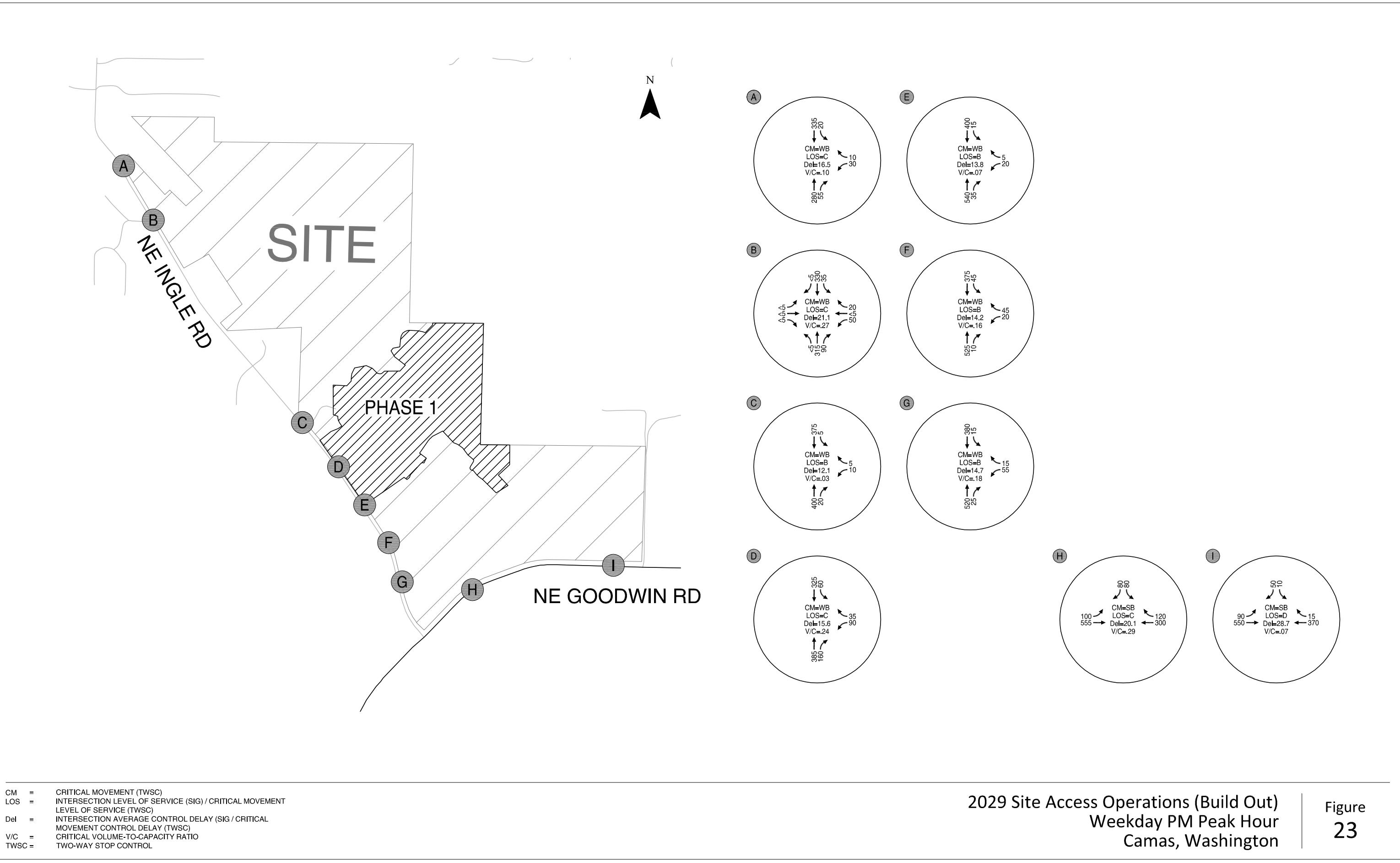
We recommend further evaluation of potential right-turn deceleration lane needs be considered at the time of site plan application. This evaluation should consider the potential need for southbound left-turn lanes or northbound right-turn lanes along NE Ingle Road at the remaining access points as well as corresponding turn lane queue storage requirements. *Appendix "O" contains the traffic operations worksheets for the full build-out access operations.*



Site Access Lane Configurations and Traffic Control Devices (Buildout)  
Camas, Washington

Figure  
21





## TRANSPORTATION COMPLIANCE LETTER

This master plan traffic study documents the transportation implications of the proposed development at build-out. There are on-site access, circulation, turn lane, and driveway location and design considerations that will need to be addressed when specific site plan applications are made. Further, the phasing and timing of master plan build-out is likely to evolve over time to adapt to market conditions. Accordingly, it is recommended that a transportation compliance letter be prepared for each preliminary plat or site plan application to address on-site transportation, access and pedestrian standards and to ensure that the mitigation measures provided for in this report are applied at the appropriate phase of development. The transportation compliance letter should also document the trip generation of each phase of development to ensure that the total number of trips generated from future development does not exceed the number of trips vested under the Development Agreement.

We recommend each transportation compliance letter could document:

- The number of site-generated trips (daily, weekday a.m. peak hour, weekday p.m. peak hour) estimated to be used by the then-current proposed site development application.
- The number of site-generated trips (daily, weekday a.m. peak hour, weekday p.m. peak hour) previously used by approved site development applications on the master plan site.
- An accounting of the number of site-generated trips (daily, weekday a.m. peak hour, weekday p.m. peak hour) remaining assuming approval of the then-current site plan application.
  - Note: In the event that a future site plan application is projected to use more trips than were previously assumed through the master plan, additional traffic capacity/concurrency analysis would be triggered (unless a traffic count cordon-study of the master plan campus demonstrates the number of trips generated by the site is less than projected by standard ITE trip rates and thus the overall development impact actually is less than or equal to the number of trips assumed by the master plan).
- Evaluation of outstanding mitigation needs (as appropriate consistent with the Master Plan recommendations) at the intersections of:
  - Need for an eastbound right-turn lane at NE 199<sup>th</sup> Avenue/NE 58<sup>th</sup> Street (SR 500)
  - NE Ingle Road/NE Goodwin Road (including traffic signal warrant analysis)

## FINDINGS AND RECOMMENDATIONS

Based on the results of the transportation impact analysis, Phase 1 of the Green Mountain Master Plan (estimated to generate 2,050 daily trips and 215 net new p.m. peak hour trips) can be developed while maintaining acceptable levels of service and safety at the study intersections without any required off-site mitigations. The primary findings and recommendations of this study are summarized below.

### Existing Conditions

- All of the study intersections currently operate acceptably during the weekday a.m. and p.m. peak hours.

### Proposed Development Activities

- Phase 1 site development includes 215 residential units. It is estimated to generate 160 net new a.m. peak hour trips (40 in and 120 out) and 215 net new p.m. peak hour trips (135 in and 80 out).
- Build-out of the site development includes 1,300 residential units and 90,000 square feet of retail use. Build-out (including Phase 1) is collectively estimated to generate a total of 995 net new a.m. peak hour trips (290 in and 705 out) and 1,655 net new p.m. peak hour trips (965 in and 690 out).
- Access to Phase 1 of the site will be provided via two full movement driveways on NW Ingle Road. In the future when the site is built out, access will be provided on both NW Ingle Road and NW Goodwin Road.

### Year 2018 Background Traffic Conditions

- Year 2018 background conditions (without construction of the Green Mountain mixed-use development) were estimated assuming completion of approved in-process developments within the study area and an annual 2% growth rate on City of Vancouver roadways.
- Operational analyses indicate that the study intersections are forecast to continue to operate acceptably.

## Year 2018 Total Traffic Conditions

- Year 2018 total traffic conditions were estimated assuming completion of approved in-process developments within the study area plus Phase 1 of the proposed development.
- Operational analyses indicate that the study intersections are forecast to continue to operate acceptably under 2018 total traffic conditions with one exception:
  - The southbound movement at the intersection of NE Ingle Road/NE Goodwin Road is projected to operate at a LOS E during the weekday p.m. peak hour. This failure is triggered by the 203<sup>rd</sup> single family residential unit in Phase 1 of the development.

## Year 2029 Background Traffic Conditions

- Year 2029 background conditions (with construction of only Phase 1 of proposed development but no further phases) were estimated assuming the same in-process developments included in the 2018 analysis as well as a one percent growth rate on City of Camas roadways and two percent growth rate on City of Vancouver roadways.
- Operational analyses indicate that the study intersections are forecast to continue to operate acceptably under year 2029 background traffic conditions with two exceptions:
  - The intersection of NE 192<sup>nd</sup> Avenue/NE 13<sup>th</sup> Street is projected to operate at a LOS E and over-capacity during the weekday a.m. peak hour and LOS F and over-capacity during the weekday p.m. peak hour,
  - The southbound approach to the intersection of NE Ingle Road/NE Goodwin Road is projected to operate at a LOS F during the weekday p.m. peak hour.

## Year 2029 Total Traffic Conditions

- Year 2029 total traffic conditions were estimated assuming year 2029 background traffic and complete build-out of the proposed Green Mountain development.
- Operational analyses indicate that the study intersections are forecast to continue to operate acceptably under year 2029 total traffic conditions, with the exception of:
  - NE 199<sup>th</sup> Avenue/NE 58<sup>th</sup> Street (SR 500) (weekday a.m. and p.m.)
  - NE 192<sup>nd</sup> Avenue/NE 13<sup>th</sup> Street (weekday a.m. and p.m.)
  - NE Ingle Road/NE Goodwin Road (weekday a.m. and p.m.)

## Turn-Lane Considerations

- An assessment of turn-lane need was conducted for each study intersection.
- The intersection of NE 199<sup>th</sup> Avenue/NE 58<sup>th</sup> Street (SR 500) meets WSDOT's guidelines for a right-turn lane on the eastbound approach under existing conditions and all future scenarios during both the weekday a.m. and p.m. peak hour.
  - The crash history indicates that no crashes were recorded between 2008-2013 involving vehicles making an eastbound right-turn.
  - Given the lack of crash history related to eastbound right-turns and the relatively small impact of Phase 1 (eight eastbound right-turn trips during the weekday a.m. peak hour, 27 eastbound right-turn trips during the weekday p.m. peak hour), no improvements are recommended in conjunction with Phase 1.
  - In the future, the provision of a right-turn taper or lane could be considered if suggested by the crash history at the intersection.
- The intersection of NE 242<sup>nd</sup> Avenue (SR 500)/NE 28<sup>th</sup> Street meets WSDOT's guidelines for a left-turn lane on the eastbound approach under existing conditions and all future scenarios during the weekday p.m. peak hour.
  - The crash history indicates that no crashes were recorded between 2008-2013 involving vehicles making an eastbound left-turn.
  - The City's long-term plans include a traffic signal and southbound left-turn lane at NE 242nd Avenue (SR 500)/NE 28th Street.
  - Given the lack of recorded crash history, the small impact of the proposed development (no Phase 1 eastbound left-turns and less than 10 at master plan build-out), and future improvement plans at this intersection, no turn-lane improvements are recommended with Phase 1 site development.

## Recommendations

- Regardless of the proposed master plan application, we recommend that the City of Camas consider potential improvements to the intersection of NE Ingle Road/NE Goodwin Road to address intersection sight distance limitations associated with the location of the stop bar, such as relocating the stop bar.
- The following improvements should be provided in conjunction with site development:
  - Phase 1 Site Development

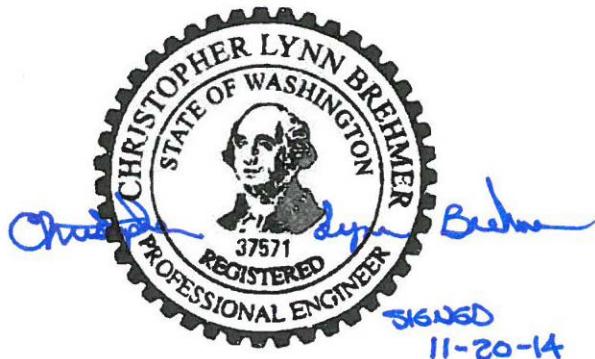
- An eastbound left-turn lane with 100 feet of storage should be provided at NE Ingle Road/NE Goodwin Road.
- A westbound right-turn lane on NE Goodwin Road at NE Ingle Road prior to occupancy of the 203<sup>rd</sup> single family home in Phase 1. The right-turn lane should provide at least 100 feet of storage.
- On-site and off-site landscaping and any above ground utilities at the site-access driveways and internal roadways should be provided appropriately to ensure that adequate sight-distance is maintained.
- For Phase 1 and all future phases, a Transportation Compliance Letter as described above should be prepared by a licensed professional engineer and submitted with the then-current site plan application.
- Full Build-Out of Site Development (items to be assessed in Transportation Compliance Letter unless otherwise mitigated):
  - Future site plan applications should provide an updated assessment as to the potential need for providing an eastbound right-turn taper or lane at the 199<sup>th</sup> Avenue (SR 500)/NE 58<sup>th</sup> Street intersection unless otherwise deemed mitigated by the project or others.
  - Pay a proportionate “fair-share” financial contribution towards capacity mitigations at the intersection of NE 192<sup>nd</sup> Avenue/NE 13<sup>th</sup> Street. This contribution would partially fund the eventual construction of a northbound right-turn lane on NE 192<sup>nd</sup> Avenue and a westbound right-turn lane on NE 13<sup>th</sup> Avenue.
- Mitigations will be needed to improve NE Ingle Road/NE Goodwin Road in 2029. We recommend the following:
  - The applicant construct a three-lane section (with center two-way left-turn lane) on NE Goodwin Road along the site frontage.
  - The applicant assess traffic volumes and signal warrants at NE Ingle Road/NE Goodwin Road with each phase of development and construct a traffic signal and related appurtenances when the intersection no longer satisfies City of Camas performance standard (LOS “D” and v/c of 0.90 or better) and intersection volumes meet traffic signal warrants.

- On-site and off-site landscaping and any above ground utilities at the site-access driveways and internal roadways should be provided appropriately to ensure that adequate sight-distance is maintained.

We trust this letter adequately addresses the traffic impacts associated with the proposed Green Mountain Master Plan development. Please contact us if you have any questions or comments regarding the contents of this report or the analysis performed.

## REFERENCES

1. Transportation Research Board 2000. Highway Capacity Manual. 2000.
2. DKS Associates. *City of Camas Traffic Impact Fee Update*. May 2012.
3. Washington State Department of Transportation. *Design Manual*. July 2013.
4. C-Tran. <http://www.c-tran.com>. May 2014.
5. Oregon Department of Transportation Research Section. *SPR 667 Assessment of Statewide Intersection Safety Performance*. June 2011.
6. American Association of State Highway and Transportation Officials. *Highway Safety Manual*. 2010.
7. Institute of Transportation Engineers. *Trip Generation Manual, 9<sup>th</sup> Edition*. 2012.
8. City of Vancouver. *Traffic Study Guidelines*. December 2013.



## Appendix A Level of Service (LOS)

## APPENDIX A LEVEL-OF-SERVICE CONCEPT

Level of service (LOS) is a concept developed to quantify the degree of comfort (including such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles) afforded to drivers as they travel through an intersection or roadway segment. Six grades are used to denote the various level of service from "A" to "F".<sup>1</sup>

### SIGNALIZED INTERSECTIONS

The six level-of-service grades are described qualitatively for signalized intersections in Table A1. Additionally, Table A2 identifies the relationship between level of service and average control delay per vehicle. Control delay is defined to include initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Using this definition, Level of Service "D" is generally considered to represent the minimum acceptable design standard.

Table A1 Level-of-Service Definitions (Signalized Intersections)

Level of Service	Average Delay per Vehicle
A	Very low average control delay, less than 10 seconds per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Average control delay is greater than 10 seconds per vehicle and less than or equal to 20 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for a level of service A, causing higher levels of average delay.
C	Average control delay is greater than 20 seconds per vehicle and less than or equal to 35 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	Average control delay is greater than 35 seconds per vehicle and less than or equal to 55 seconds per vehicle. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle length, or high volume/capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Average control delay is greater than 55 seconds per vehicle and less than or equal to 80 seconds per vehicle. This is usually considered to be the limit of acceptable delay. These high delay values generally (but not always) indicate poor progression, long cycle lengths, and high volume/capacity ratios. Individual cycle failures are frequent occurrences.
F	Average control delay is in excess of 80 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation. It may also occur at high volume/capacity ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such high delay values.

<sup>1</sup> Most of the material in this appendix is adapted from the Transportation Research Board, *2000 Highway Capacity Manual*, (2000).

Table A2 Level-of-Service Criteria for Signalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	<10.0
B	>10 and $\leq$ 20
C	>20 and $\leq$ 35
D	>35 and $\leq$ 55
E	>55 and $\leq$ 80
F	>80

## UNSIGNALIZED INTERSECTIONS

Unsignalized intersections include two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections. The *2000 Highway Capacity Manual* (HCM) provides models for estimating control delay at both TWSC and AWSC intersections. A qualitative description of the various service levels associated with an unsignalized intersection is presented in Table A3. A quantitative definition of level of service for unsignalized intersections is presented in Table A4. Using this definition, Level of Service “E” is generally considered to represent the minimum acceptable design standard.

Table A3 Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Delay per Vehicle to Minor Street
A	<ul style="list-style-type: none"><li>Nearly all drivers find freedom of operation.</li><li>Very seldom is there more than one vehicle in queue.</li></ul>
B	<ul style="list-style-type: none"><li>Some drivers begin to consider the delay an inconvenience.</li><li>Occasionally there is more than one vehicle in queue.</li></ul>
C	<ul style="list-style-type: none"><li>Many times there is more than one vehicle in queue.</li><li>Most drivers feel restricted, but not objectionably so.</li></ul>
D	<ul style="list-style-type: none"><li>Often there is more than one vehicle in queue.</li><li>Drivers feel quite restricted.</li></ul>
E	<ul style="list-style-type: none"><li>Represents a condition in which the demand is near or equal to the probable maximum number of vehicles that can be accommodated by the movement.</li><li>There is almost always more than one vehicle in queue.</li><li>Drivers find the delays approaching intolerable levels.</li></ul>
F	<ul style="list-style-type: none"><li>Forced flow.</li><li>Represents an intersection failure condition that is caused by geometric and/or operational constraints external to the intersection.</li></ul>

Table A4 Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	<10.0
B	>10.0 and $\leq$ 15.0
C	>15.0 and $\leq$ 25.0
D	>25.0 and $\leq$ 35.0
E	>35.0 and $\leq$ 50.0
F	>50.0

It should be noted that the level-of-service criteria for unsignalized intersections are somewhat different than the criteria used for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, there are a number of driver behavior considerations that combine to make delays at signalized intersections less galling than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, while drivers on the minor street approaches to TWSC intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized intersections than signalized intersections. For these reasons, it is considered that the control delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. While overall intersection level of service is calculated for AWSC intersections, level of service is only calculated for the minor approaches and the major street left turn movements at TWSC intersections. No delay is assumed to the major street through movements. For TWSC intersections, the overall intersection level of service remains undefined: level of service is only calculated for each minor street lane.

In the performance evaluation of TWSC intersections, it is important to consider other measures of effectiveness (MOEs) in addition to delay, such as v/c ratios for individual movements, average queue lengths, and 95th-percentile queue lengths. By focusing on a single MOE for the worst movement only, such as delay for the minor-street left turn, users may make inappropriate traffic control decisions. The potential for making such inappropriate decisions is likely to be particularly pronounced when the HCM level-of-service thresholds are adopted as legal standards, as is the case in many public agencies.

## Appendix B Crash Data

**REPORTED COLLISIONS THAT OCCURRED AT THE FOLLOWING INTERSECTIONS IN VANCOUVER, CAMPUS OR CLARK COUNTY... 1/1/08 - 11/30/13**

U.S. CODE - SECTION 802. THIS DATA CANNOT BE USED IN DISCOVERY OR AS EVIDENCE AT TRIAL IN ANY ACTION FOR DAMAGES AGAINST THE WSDOT, OR ANY JURISDICTION INVOLVED IN THE DATA.

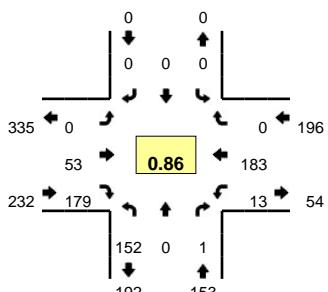
## Appendix C Traffic Counts

Type of peak hour being reported: Intersection Peak

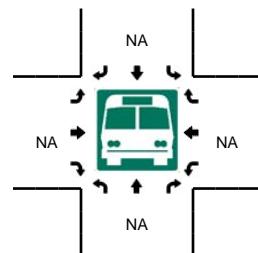
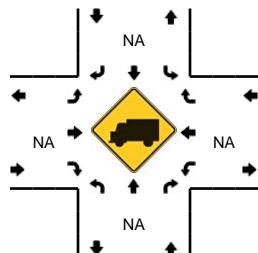
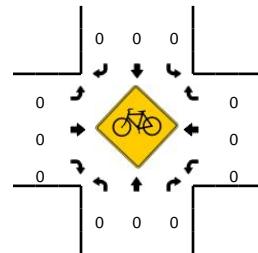
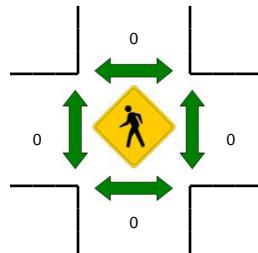
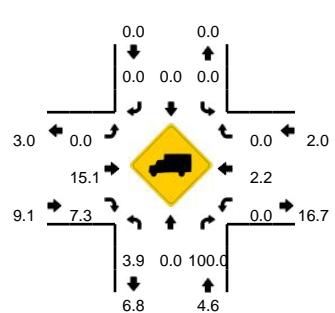
Method for determining peak hour: Total Entering Volume

**LOCATION:** NE 199th Ave -- NE 58th St  
**CITY/STATE:** Vancouver, WA

**QC JOB #:** 12426915  
**DATE:** Thu, Feb 20 2014



**Peak-Hour: 7:10 AM -- 8:10 AM**  
**Peak 15-Min: 7:25 AM -- 7:40 AM**



5-Min Count Period Beginning At	NE 199th Ave (Northbound)				NE 199th Ave (Southbound)				NE 58th St (Eastbound)				NE 58th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	7	0	0	0	0	0	0	0	0	2	7	0	0	0	10	0	0	26
7:05 AM	10	0	0	0	0	0	0	0	0	3	17	0	1	7	0	0	0	38
7:10 AM	12	0	0	0	0	0	0	0	0	7	14	0	1	24	0	0	0	58
7:15 AM	8	0	0	0	0	0	0	0	0	4	26	0	1	19	0	0	0	58
7:20 AM	14	0	0	0	0	0	0	0	0	3	16	0	2	12	0	0	0	47
7:25 AM	8	0	0	0	0	0	0	0	0	4	23	0	2	19	0	0	0	56
7:30 AM	12	0	0	0	0	0	0	0	0	4	19	0	1	19	0	0	0	55
7:35 AM	15	0	1	0	0	0	0	0	0	8	17	0	2	15	0	0	0	58
7:40 AM	9	0	0	0	0	0	0	0	0	2	8	0	0	21	0	0	0	40
7:45 AM	27	0	0	0	0	0	0	0	0	2	13	0	0	13	0	0	0	55
7:50 AM	14	0	0	0	0	0	0	0	0	2	13	0	1	11	0	0	0	41
7:55 AM	12	0	0	0	0	0	0	0	0	5	12	0	1	9	0	0	0	39
8:00 AM	13	0	0	0	0	0	0	0	0	4	7	0	1	8	0	0	0	578
8:05 AM	8	0	0	0	0	0	0	0	0	8	11	0	1	13	0	0	0	581
8:10 AM	10	0	2	0	0	0	0	0	0	2	9	0	1	10	0	0	0	557
8:15 AM	13	0	1	0	0	0	0	0	0	5	10	0	2	8	0	0	0	538
8:20 AM	2	0	1	0	0	0	0	0	0	4	6	0	0	9	0	0	0	513
8:25 AM	11	0	1	0	0	0	0	0	0	1	3	0	0	15	0	0	0	488
8:30 AM	12	0	0	0	0	0	0	0	0	1	6	0	0	9	0	0	0	461
8:35 AM	8	0	0	0	0	0	0	0	0	5	12	0	0	12	0	0	0	440
8:40 AM	10	0	0	0	0	0	0	0	0	2	6	0	1	15	0	0	0	434
8:45 AM	12	0	1	0	0	0	0	0	0	1	6	0	2	12	0	0	0	413
8:50 AM	9	0	0	0	0	0	0	0	0	3	9	0	2	11	0	0	0	406
8:55 AM	6	0	0	0	0	0	0	0	0	7	8	0	0	10	0	0	0	398
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound					
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Total	
All Vehicles	140	0	4	0	0	0	0	0	0	64	236	0	20	212	0	0	676	
Heavy Trucks	12	0	4		0	0	0	0	0	12	8		0	4	0	0	40	
Pedestrians	0				0				0				0				0	
Bicycles	0	0	0		0	0	0	0	0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

Comments:

Report generated on 4/8/2014 11:05 AM

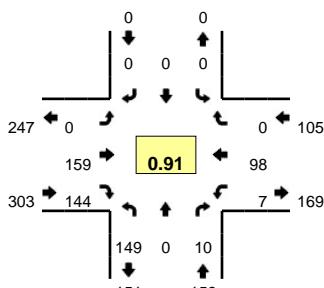
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

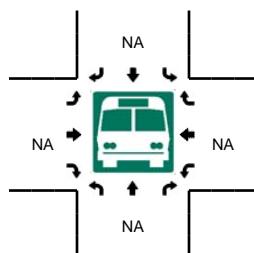
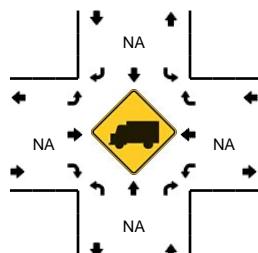
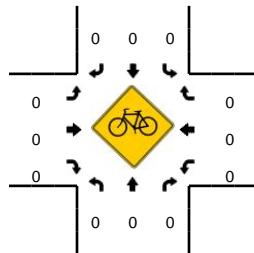
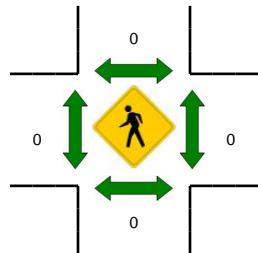
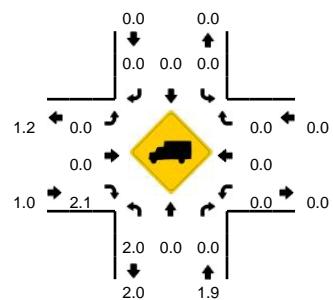
Method for determining peak hour: Total Entering Volume

**LOCATION:** NE 199th Ave -- NE 58th St  
**CITY/STATE:** Vancouver, WA

**QC JOB #:** 12426916  
**DATE:** Thu, Feb 20 2014



Peak-Hour: 4:30 PM -- 5:30 PM  
Peak 15-Min: 5:15 PM -- 5:30 PM



5-Min Count Period Beginning At	NE 199th Ave (Northbound)				NE 199th Ave (Southbound)				NE 58th St (Eastbound)				NE 58th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	9	0	1	0	0	0	0	0	0	21	4	0	0	8	0	0	43	
4:05 PM	9	0	1	0	0	0	0	0	0	14	12	0	0	11	0	0	47	
4:10 PM	9	0	4	0	0	0	0	0	0	14	9	0	1	7	0	0	44	
4:15 PM	13	0	0	0	0	0	0	0	0	16	15	0	1	3	0	0	48	
4:20 PM	13	0	0	0	0	0	0	0	0	12	10	0	0	9	0	0	44	
4:25 PM	4	0	0	0	0	0	0	0	0	13	7	0	0	8	0	0	32	
4:30 PM	12	0	0	0	0	0	0	0	0	15	16	0	1	5	0	0	49	
4:35 PM	9	0	2	0	0	0	0	0	0	12	14	0	1	4	0	0	42	
4:40 PM	18	0	0	0	0	0	0	0	0	16	8	0	2	13	0	0	57	
4:45 PM	8	0	1	0	0	0	0	0	0	9	11	0	0	10	0	0	39	
4:50 PM	8	0	2	0	0	0	0	0	0	16	7	0	1	8	0	0	42	
4:55 PM	12	0	2	0	0	0	0	0	0	13	10	0	0	8	0	0	45	532
5:00 PM	14	0	0	0	0	0	0	0	0	13	8	0	0	6	0	0	41	530
5:05 PM	18	0	1	0	0	0	0	0	0	12	11	0	0	11	0	0	53	536
5:10 PM	6	0	0	0	0	0	0	0	0	14	15	0	0	8	0	0	43	535
5:15 PM	11	0	1	0	0	0	0	0	0	12	14	0	0	10	0	0	48	535
5:20 PM	18	0	0	0	0	0	0	0	0	16	15	0	1	7	0	0	57	548
5:25 PM	15	0	1	0	0	0	0	0	0	11	15	0	1	8	0	0	51	567
5:30 PM	4	0	1	0	0	0	0	0	0	10	16	0	0	11	0	0	42	560
5:35 PM	8	0	1	0	0	0	0	0	0	13	12	0	1	7	0	0	42	560
5:40 PM	16	0	2	0	0	0	0	0	0	11	12	0	1	5	0	0	47	550
5:45 PM	9	0	3	0	0	0	0	0	0	6	12	0	0	7	0	0	37	548
5:50 PM	11	0	0	0	0	0	0	0	0	17	13	0	1	9	0	0	51	557
5:55 PM	6	0	1	0	0	0	0	0	0	10	5	0	0	6	0	0	28	540
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Total	
All Vehicles	176	0	8	0	0	0	0	0	0	156	176	0	8	100	0	0	624	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians	0																0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:

Report generated on 2/28/2014 10:39 AM

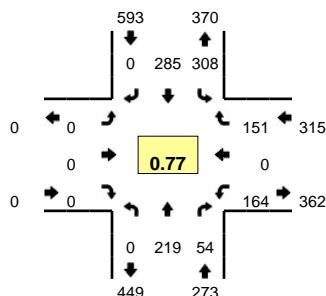
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

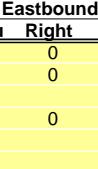
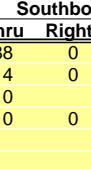
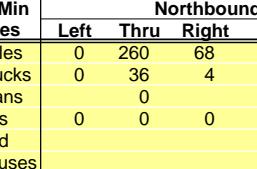
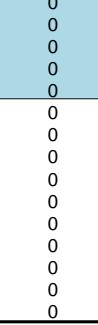
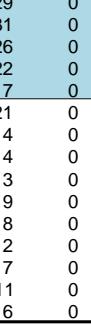
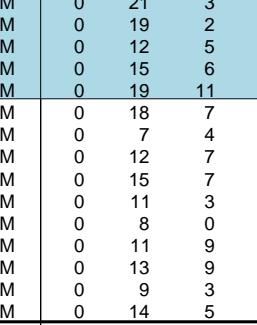
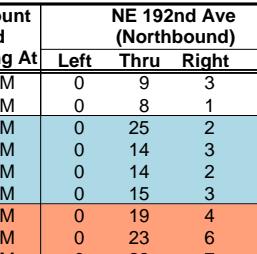
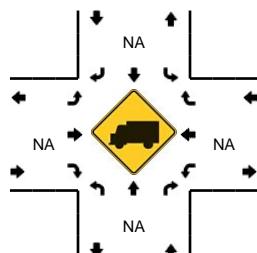
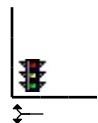
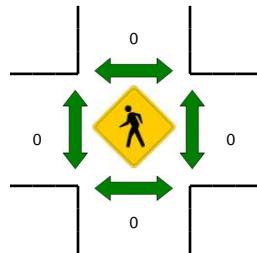
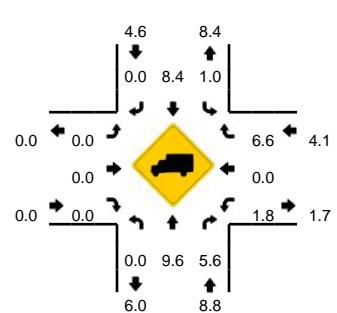
Method for determining peak hour: Total Entering Volume

**LOCATION:** NE 192nd Ave -- NE 13th St  
**CITY/STATE:** Vancouver, WA

**QC JOB #:** 12426913  
**DATE:** Thu, Feb 20 2014



**Peak-Hour: 7:10 AM -- 8:10 AM**  
**Peak 15-Min: 7:30 AM -- 7:45 AM**



5-Min Count Period Beginning At	NE 192nd Ave (Northbound)				NE 192nd Ave (Southbound)				NE 13th St (Eastbound)				NE 13th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	9	3	0	8	21	0	0	0	0	0	0	5	0	2	0	48	
7:05 AM	0	8	1	0	16	14	0	0	0	0	0	0	11	0	3	0	53	
7:10 AM	0	25	2	0	25	23	0	0	0	0	0	0	13	0	6	0	94	
7:15 AM	0	14	3	0	25	22	0	0	0	0	0	0	14	0	10	0	88	
7:20 AM	0	14	2	0	28	22	0	0	0	0	0	0	10	0	15	0	91	
7:25 AM	0	15	3	0	47	21	0	0	0	0	0	0	15	0	9	0	110	
7:30 AM	0	19	4	0	52	20	0	0	0	0	0	0	12	0	15	0	122	
7:35 AM	0	23	6	0	57	27	0	0	0	0	0	0	10	0	14	0	137	
7:40 AM	0	23	7	0	27	25	0	0	0	0	0	0	20	0	24	0	126	
7:45 AM	0	21	3	0	10	29	0	0	0	0	0	0	17	0	22	0	102	
7:50 AM	0	19	2	0	7	31	0	0	0	0	0	0	16	0	14	0	89	
7:55 AM	0	12	5	0	14	26	0	0	0	0	0	0	14	0	9	0	80	1140
8:00 AM	0	15	6	0	11	22	0	0	0	0	0	0	8	0	7	0	69	1161
8:05 AM	0	19	11	0	5	17	0	0	0	0	0	0	15	0	6	0	73	1181
8:10 AM	0	18	7	0	5	21	0	0	0	0	0	0	10	0	2	0	63	1150
8:15 AM	0	7	4	0	6	14	0	0	0	0	0	0	9	0	3	0	43	1105
8:20 AM	0	12	7	0	6	14	0	0	0	0	0	0	7	0	11	0	57	1071
8:25 AM	0	15	7	0	9	13	0	0	0	0	0	0	8	0	3	0	55	1016
8:30 AM	0	11	3	0	7	19	0	0	0	0	0	0	9	0	2	0	51	945
8:35 AM	0	8	0	0	16	18	0	0	0	0	0	0	17	0	3	0	62	870
8:40 AM	0	11	9	0	18	12	0	0	0	0	0	0	16	0	3	0	69	813
8:45 AM	0	13	9	0	8	17	0	0	0	0	0	0	9	0	7	0	63	774
8:50 AM	0	9	3	0	6	11	0	0	0	0	0	0	16	0	11	0	56	741
8:55 AM	0	14	5	0	6	16	0	0	0	0	0	0	22	0	7	0	70	731
<b>Peak 15-Min Flowrates</b>	Northbound				Southbound				Eastbound				Westbound				<b>Total</b>	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	260	68	0	544	288	0	0	0	0	0	0	168	0	212	0	1540	
Heavy Trucks	0	36	4	0	0	4	0	0	0	0	0	0	0	0	28	0	72	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

*Comments:*

Report generated on 2/28/2014 10:33 AM

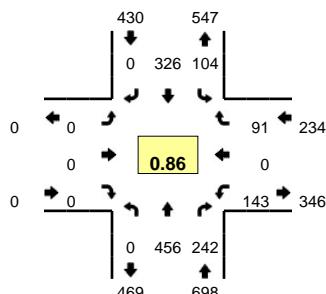
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

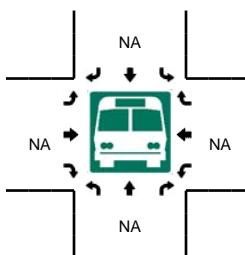
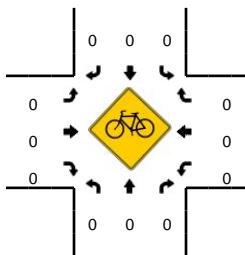
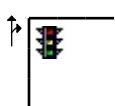
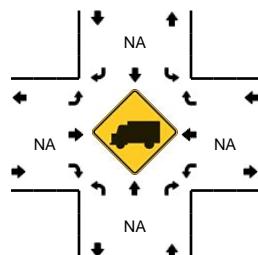
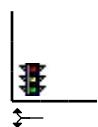
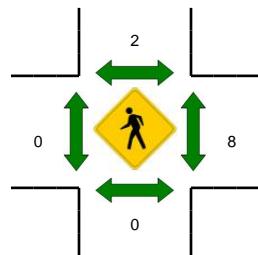
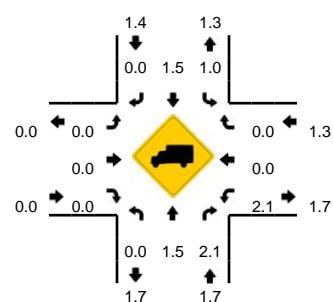
Method for determining peak hour: Total Entering Volume

**LOCATION:** NE 192nd Ave -- NE 13th St  
**CITY/STATE:** Vancouver, WA

**QC JOB #:** 12426914  
**DATE:** Thu, Feb 20 2014



**Peak-Hour: 4:50 PM -- 5:50 PM**  
**Peak 15-Min: 5:05 PM -- 5:20 PM**



5-Min Count Period Beginning At	NE 192nd Ave (Northbound)				NE 192nd Ave (Southbound)				NE 13th St (Eastbound)				NE 13th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	28	11	0	12	15	0	0	0	0	0	0	10	0	9	0	85	
4:05 PM	0	34	13	0	5	23	0	0	0	0	0	0	10	0	7	0	92	
4:10 PM	0	37	15	0	8	29	0	0	0	0	0	0	13	0	13	0	115	
4:15 PM	0	35	10	0	10	15	0	0	0	0	0	0	4	0	11	0	85	
4:20 PM	0	38	23	0	7	17	0	0	0	0	0	0	7	0	5	0	97	
4:25 PM	0	36	16	0	9	25	0	0	0	0	0	0	14	0	8	0	108	
4:30 PM	0	24	18	0	4	21	0	0	0	0	0	0	7	0	7	0	81	
4:35 PM	0	40	15	0	9	20	0	0	0	0	0	0	12	0	6	0	102	
4:40 PM	0	33	20	0	6	36	0	0	0	0	0	0	10	0	4	0	109	
4:45 PM	0	35	12	0	12	27	0	0	0	0	0	0	16	0	3	0	105	
4:50 PM	0	39	19	0	5	35	0	0	0	0	0	0	11	0	6	0	115	
4:55 PM	0	38	22	0	12	25	0	0	0	0	0	0	15	0	11	0	123	1217
5:00 PM	0	33	27	0	10	22	0	0	0	0	0	0	7	0	6	0	105	1237
5:05 PM	0	48	17	0	8	34	0	0	0	0	0	0	6	0	8	0	121	1266
5:10 PM	0	51	17	0	14	29	0	0	0	0	0	0	22	0	9	0	142	1293
5:15 PM	0	47	21	0	13	23	0	0	0	0	0	0	20	0	10	0	134	1342
5:20 PM	0	41	19	0	7	20	0	0	0	0	0	0	13	0	5	0	105	1350
5:25 PM	0	22	15	0	6	20	0	0	0	0	0	0	17	0	9	0	89	1331
5:30 PM	0	36	19	0	6	33	0	0	0	0	0	0	6	0	7	0	107	1357
5:35 PM	0	27	27	0	7	28	0	0	0	0	0	0	8	0	8	0	105	1360
5:40 PM	0	44	18	0	6	30	0	0	0	0	0	0	8	0	2	0	108	1359
5:45 PM	0	30	21	0	10	27	0	0	0	0	0	0	10	0	10	0	108	1362
5:50 PM	0	20	20	0	7	16	0	0	0	0	0	0	16	0	13	0	92	1339
5:55 PM	0	41	17	0	5	22	0	0	0	0	0	0	14	0	11	0	110	1326
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound					
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Total	
All Vehicles	0	584	220	0	140	344	0	0	0	0	0	0	192	0	108	0	1588	
Heavy Trucks	0	8	4		4	4	0	0	0	0	0	0	4	0	0	0	24	
Pedestrians	0					8			0					8			16	
Bicycles	0	0	0		0	0	0		0	0	0	0	0	0	0		0	
Railroad																		
Stopped Buses																		

Comments:

Report generated on 2/28/2014 10:39 AM

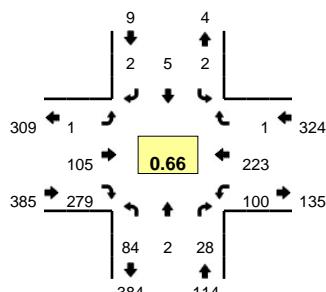
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

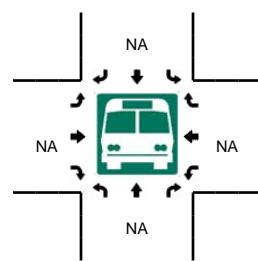
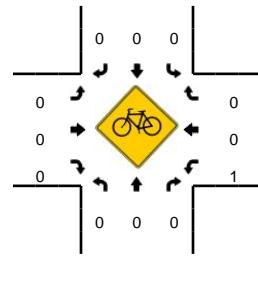
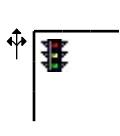
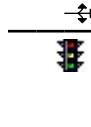
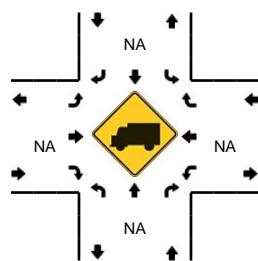
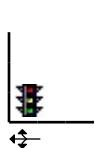
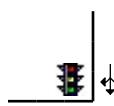
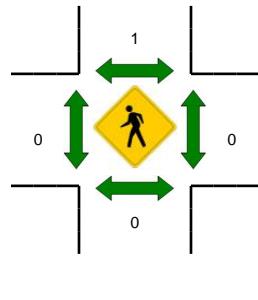
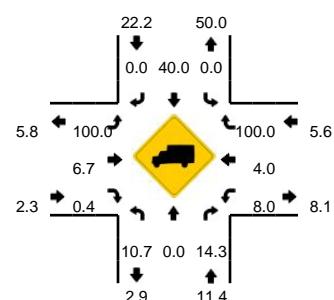
Method for determining peak hour: Total Entering Volume

**LOCATION:** NW Friberg St -- NE Goodwin Rd  
**CITY/STATE:** Camas, WA

**QC JOB #:** 12426911  
**DATE:** Tue, Feb 25 2014



**Peak-Hour: 7:05 AM -- 8:05 AM**  
**Peak 15-Min: 7:30 AM -- 7:45 AM**



5-Min Count Period Beginning At	NW Friberg St (Northbound)				NW Friberg St (Southbound)				NE Goodwin Rd (Eastbound)				NE Goodwin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	0	2	0	0	2	1	0	0	11	5	0	6	13	0	0	41	
7:05 AM	2	1	1	0	0	0	0	0	0	8	12	0	3	20	0	0	47	
7:10 AM	4	0	3	0	0	1	0	0	0	7	16	0	8	17	0	0	56	
7:15 AM	6	0	1	0	0	1	0	0	1	11	25	0	8	11	0	0	64	
7:20 AM	4	0	0	0	0	1	0	0	0	5	24	0	22	20	0	0	76	
7:25 AM	6	0	6	0	1	1	0	0	0	6	36	0	5	13	0	0	74	
7:30 AM	8	1	3	0	0	0	0	0	0	7	48	0	12	24	0	0	103	
7:35 AM	14	0	7	0	0	0	1	0	0	7	56	0	19	14	0	0	118	
7:40 AM	13	0	3	0	0	0	0	0	0	9	38	0	9	24	0	0	96	
7:45 AM	13	0	2	0	0	0	0	0	0	8	14	0	4	20	0	0	61	
7:50 AM	7	0	0	0	0	1	0	0	0	8	4	0	4	20	1	0	45	
7:55 AM	3	0	1	0	0	0	0	0	0	10	4	0	4	18	0	0	40	
8:00 AM	4	0	1	0	1	0	1	0	0	19	2	0	2	22	0	0	52	821
																	832	
8:05 AM	2	0	1	0	0	0	0	0	0	5	2	0	1	16	0	0	27	812
8:10 AM	2	1	0	0	0	0	0	0	2	2	2	0	7	13	0	0	29	785
8:15 AM	0	0	1	0	0	0	0	0	0	5	2	0	2	13	0	0	23	744
8:20 AM	2	1	0	0	0	0	0	0	0	14	2	0	0	18	0	0	37	705
8:25 AM	1	0	1	0	0	1	0	0	0	12	3	0	3	10	0	0	31	662
8:30 AM	1	0	1	0	0	0	0	0	0	11	10	0	3	18	0	0	44	603
8:35 AM	0	0	2	0	0	0	1	0	0	6	6	0	3	17	0	0	35	520
8:40 AM	1	0	2	0	0	0	1	0	0	4	10	0	6	17	0	0	41	465
8:45 AM	2	0	1	0	0	0	0	0	1	10	4	0	1	12	0	0	31	435
8:50 AM	4	0	1	0	0	2	0	0	0	7	1	0	1	20	0	0	36	426
8:55 AM	2	0	2	0	0	0	0	0	0	6	2	0	1	18	0	0	31	417
<b>Peak 15-Min Flowrates</b>	Northbound				Southbound				Eastbound				Westbound				<b>Total</b>	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	140	4	52	0	0	0	4	0	0	92	568	0	160	248	0	0	1268	
Heavy Trucks	16	0	4	0	0	0	0	0	0	4	0	0	0	8	0	0	32	
Pedestrians	0																0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

*Comments:*

Report generated on 2/28/2014 10:33 AM

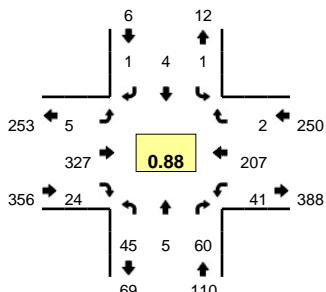
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

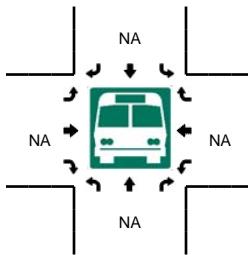
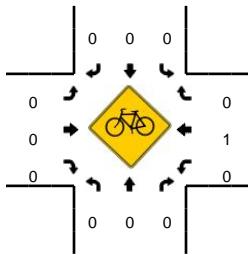
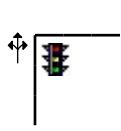
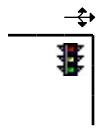
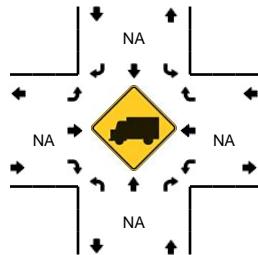
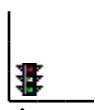
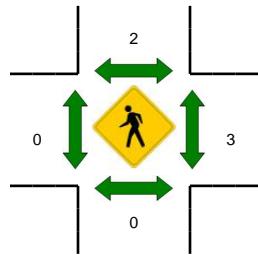
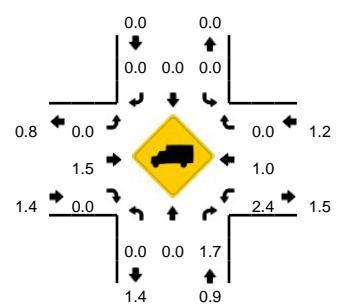
Method for determining peak hour: Total Entering Volume

**LOCATION:** NW Friberg St -- NE Goodwin Rd  
**CITY/STATE:** Camas, WA

**QC JOB #:** 12426912  
**DATE:** Tue, Feb 25 2014



**Peak-Hour: 4:45 PM -- 5:45 PM**  
**Peak 15-Min: 5:05 PM -- 5:20 PM**



5-Min Count Period Beginning At	NW Friberg St (Northbound)				NW Friberg St (Southbound)				NE Goodwin Rd (Eastbound)				NE Goodwin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	3	1	3	0	0	1	0	0	0	20	1	0	5	18	0	0	52	
4:05 PM	6	1	7	0	1	0	0	0	1	26	3	0	3	17	0	0	65	
4:10 PM	9	0	5	0	0	0	1	0	0	25	5	0	0	7	0	0	52	
4:15 PM	3	0	8	0	0	0	0	0	0	16	0	0	1	12	0	0	40	
4:20 PM	2	0	3	0	0	0	1	0	0	19	0	0	2	18	1	0	46	
4:25 PM	4	0	6	0	0	1	1	0	0	20	0	0	3	12	0	0	47	
4:30 PM	0	1	2	0	0	0	0	0	1	21	2	0	4	11	0	0	42	
4:35 PM	4	0	3	0	0	0	0	0	1	18	0	0	1	13	0	0	40	
4:40 PM	4	0	4	0	0	0	0	0	0	24	4	0	2	16	0	0	54	
4:45 PM	2	0	3	0	0	1	1	0	0	23	6	0	5	17	0	0	58	
4:50 PM	5	0	4	0	0	1	0	0	1	20	1	0	3	12	0	0	47	
4:55 PM	3	0	4	0	0	0	0	0	1	26	0	0	3	18	0	0	55	598
5:00 PM	9	0	3	0	0	1	0	0	0	30	4	0	5	11	0	0	63	609
5:05 PM	4	0	7	0	0	0	0	0	1	29	0	0	4	23	0	0	68	612
5:10 PM	5	2	5	0	0	0	0	0	0	32	4	0	3	17	0	0	68	628
5:15 PM	4	1	1	0	1	0	0	0	1	35	2	0	2	20	1	0	68	656
5:20 PM	3	0	7	0	0	0	0	0	1	24	1	0	1	18	0	0	55	665
5:25 PM	5	0	10	0	0	0	0	0	0	26	1	0	2	13	0	0	57	675
5:30 PM	0	1	9	0	0	0	0	0	0	20	1	0	3	14	1	0	49	682
5:35 PM	4	1	1	0	0	1	0	0	0	27	3	0	5	24	0	0	66	708
5:40 PM	1	0	6	0	0	0	0	0	0	35	1	0	5	20	0	0	68	722
5:45 PM	1	1	5	0	0	0	0	0	1	29	0	0	3	14	0	0	54	718
5:50 PM	3	1	8	0	0	0	0	0	0	23	0	0	1	10	0	0	46	717
5:55 PM	1	0	6	0	0	0	0	0	0	16	0	0	2	13	0	0	38	700
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound					
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Total	
All Vehicles	52	12	52	0	4	0	0	0	8	384	24	0	36	240	4	0	816	
Heavy Trucks	0	0	0		0	0	0		0	8	0		0	4	0		12	
Pedestrians	0				0				0				8				8	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

Comments:

Report generated on 2/28/2014 10:39 AM

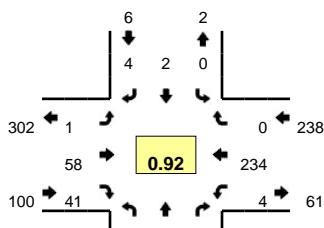
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

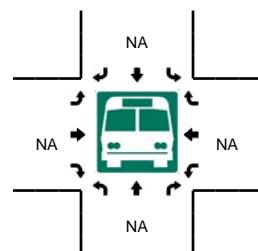
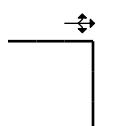
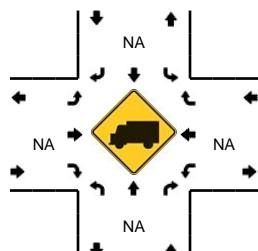
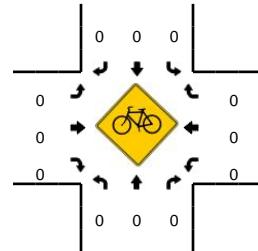
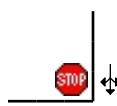
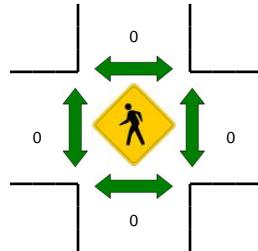
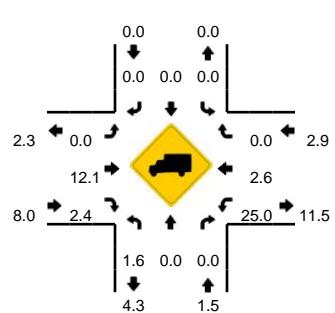
Method for determining peak hour: Total Entering Volume

**LOCATION:** NE 232nd Ave -- NE 28th St  
**CITY/STATE:** Camas, WA

**QC JOB #:** 12426907  
**DATE:** Thu, Feb 20 2014



**Peak-Hour: 7:05 AM -- 8:05 AM**  
**Peak 15-Min: 7:10 AM -- 7:25 AM**



5-Min Count Period Beginning At	NE 232nd Ave (Northbound)				NE 232nd Ave (Southbound)				NE 28th St (Eastbound)				NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	0	0	0	0	0	0	0	0	4	2	0	0	0	13	0	0	22
7:05 AM	6	0	0	0	0	0	0	0	0	4	4	0	1	17	0	0	32	
7:10 AM	2	0	0	0	0	0	0	0	0	12	9	0	0	20	0	0	43	
7:15 AM	7	0	0	0	0	0	0	0	0	6	3	0	0	20	0	0	36	
7:20 AM	5	0	1	0	0	0	0	0	0	5	1	0	1	20	0	0	33	
7:25 AM	5	0	0	0	0	2	0	0	0	3	3	0	0	20	0	0	33	
7:30 AM	5	0	0	0	0	0	0	0	0	5	2	0	0	20	0	0	32	
7:35 AM	5	0	0	0	0	0	1	0	0	4	3	0	1	22	0	0	36	
7:40 AM	4	1	1	0	0	0	0	0	0	5	4	0	0	18	0	0	33	
7:45 AM	4	0	0	0	0	0	2	0	0	1	2	0	1	28	0	0	38	
7:50 AM	8	0	0	0	0	0	0	0	1	4	4	0	0	18	0	0	35	
7:55 AM	5	0	0	0	0	0	0	0	0	3	3	0	0	13	0	0	24	397
8:00 AM	8	0	1	0	0	0	0	1	0	6	3	0	0	18	0	0	37	412
8:05 AM	1	0	0	0	0	0	0	0	0	6	0	0	1	16	0	0	24	404
8:10 AM	2	0	0	0	0	0	0	0	0	5	4	0	0	16	0	0	27	388
8:15 AM	1	0	0	0	0	0	0	0	0	6	3	0	0	16	0	0	26	378
8:20 AM	1	0	0	0	0	0	1	0	0	2	1	0	0	12	0	0	17	362
8:25 AM	5	0	2	0	0	0	0	0	0	5	1	0	0	16	0	0	29	358
8:30 AM	1	0	0	0	0	0	3	0	0	8	1	0	0	18	0	0	31	357
8:35 AM	4	0	0	0	0	0	1	0	0	6	3	0	0	13	0	0	27	348
8:40 AM	1	0	0	0	0	0	0	0	0	3	1	0	0	22	0	0	27	342
8:45 AM	3	0	0	0	0	0	0	0	0	12	3	0	0	21	0	0	39	343
8:50 AM	2	0	1	0	0	0	0	1	0	6	0	0	0	19	0	0	29	337
8:55 AM	2	0	0	0	0	0	0	0	0	3	2	0	2	20	0	0	29	342

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	56	0	4	0	0	0	0	0	0	92	52	0	4	240	0	0	448
Heavy Trucks	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0	16
Pedestrians	0																0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Railroad																	
Stopped Buses																	

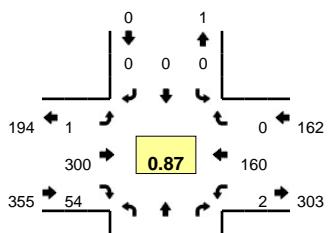
*Comments:*

Type of peak hour being reported: Intersection Peak

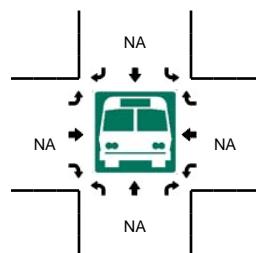
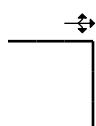
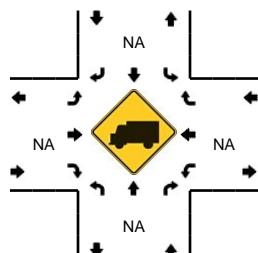
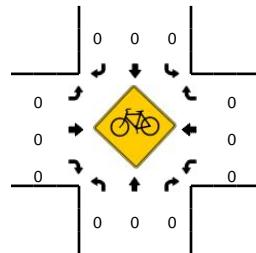
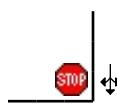
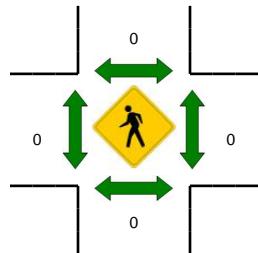
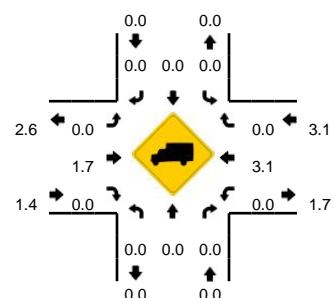
Method for determining peak hour: Total Entering Volume

**LOCATION:** NE 232nd Ave -- NE 28th St  
**CITY/STATE:** Camas, WA

**QC JOB #:** 12426908  
**DATE:** Thu, Feb 20 2014



**Peak-Hour: 5:00 PM -- 6:00 PM**  
**Peak 15-Min: 5:15 PM -- 5:30 PM**



5-Min Count Period Beginning At	NE 232nd Ave (Northbound)				NE 232nd Ave (Southbound)				NE 28th St (Eastbound)				NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	4	0	0	0	0	0	0	0	0	17	5	0	0	11	0	0	37	
4:05 PM	0	0	0	0	0	0	0	0	0	19	3	0	0	18	0	0	40	
4:10 PM	6	0	0	0	0	0	0	0	1	22	2	0	0	11	0	0	42	
4:15 PM	5	0	1	0	0	0	0	0	0	18	1	0	0	12	0	0	37	
4:20 PM	2	0	1	0	0	0	0	0	0	18	7	0	0	8	0	0	37	
4:25 PM	4	0	0	0	0	0	0	0	1	29	3	0	0	8	0	0	45	
4:30 PM	5	0	0	0	1	0	0	0	0	19	3	0	1	12	0	0	41	
4:35 PM	2	0	0	0	0	0	1	0	0	23	2	0	1	8	0	0	37	
4:40 PM	1	0	1	0	0	0	0	0	2	23	5	0	1	15	0	0	48	
4:45 PM	4	0	0	0	0	0	1	0	0	18	3	0	0	7	0	0	33	
4:50 PM	2	0	1	0	0	0	0	0	1	19	5	0	1	21	0	0	50	
4:55 PM	3	0	0	0	0	0	0	0	0	21	1	0	0	10	0	0	35	482
5:00 PM	3	0	0	0	0	0	0	0	1	27	4	0	0	15	0	0	50	495
5:05 PM	2	0	0	0	0	0	0	0	0	26	3	0	0	15	0	0	46	501
5:10 PM	3	0	0	0	0	0	0	0	0	20	3	0	0	19	0	0	45	504
5:15 PM	5	0	0	0	0	0	0	0	0	25	10	0	0	11	0	0	51	518
5:20 PM	2	0	0	0	0	0	0	0	0	38	4	0	0	11	0	0	55	536
5:25 PM	2	0	1	0	0	0	0	0	0	27	5	0	0	19	0	0	54	545
5:30 PM	5	0	0	0	0	0	0	0	0	19	3	0	0	7	0	0	34	538
5:35 PM	0	0	2	0	0	0	0	0	0	26	3	0	1	10	0	0	42	543
5:40 PM	3	0	0	0	0	0	0	0	0	21	5	0	0	15	0	0	44	539
5:45 PM	3	0	0	0	0	0	0	0	0	23	6	0	0	12	0	0	44	550
5:50 PM	2	0	0	0	0	0	0	0	0	25	4	0	0	14	0	0	45	545
5:55 PM	4	0	0	0	0	0	0	0	0	23	4	0	1	12	0	0	44	554

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	36	0	4	0	0	0	0	0	0	360	76	0	0	164	0	0	640
Heavy Trucks	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
Pedestrians	0																0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Railroad																	
Stopped Buses																	

*Comments:*

Report generated on 2/28/2014 10:39 AM

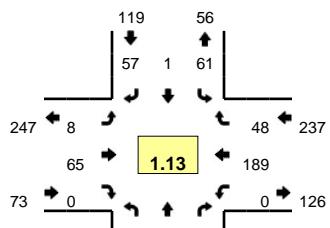
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: System Peak

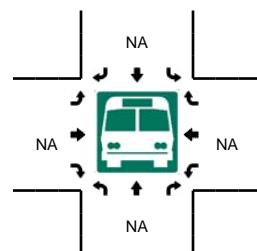
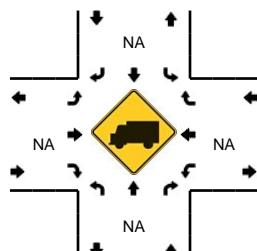
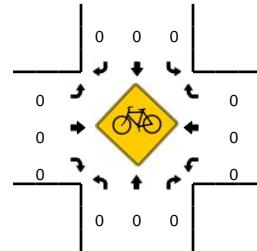
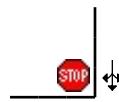
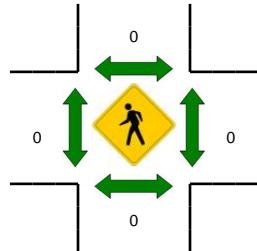
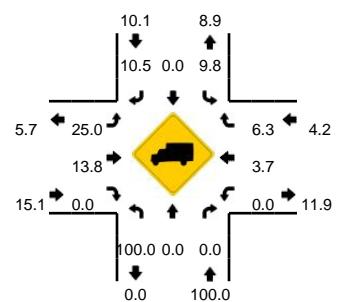
Method for determining peak hour: Total Entering Volume

**LOCATION:** NE 242nd Ave -- NE 28th St  
**CITY/STATE:** Camas, WA

**QC JOB #:** 12470705  
**DATE:** Thu, Apr 03 2014



**Peak-Hour: 7:05 AM -- 8:05 AM**  
**Peak 15-Min: 7:40 AM -- 7:55 AM**



5-Min Count Period Beginning At	NE 242nd Ave (Northbound)				NE 242nd Ave (Southbound)				NE 28th St (Eastbound)				NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	3	0	1	0	1	1	1	0	0	11	0	0	18	
7:05 AM	0	0	0	0	2	0	6	0	1	14	0	0	0	24	2	0	49	
7:10 AM	0	0	0	0	7	0	1	0	1	4	0	0	0	12	3	0	28	
7:15 AM	0	0	0	0	7	1	6	0	0	3	0	0	0	12	5	0	34	
7:20 AM	0	0	0	0	9	0	4	0	0	1	0	0	0	15	6	0	35	
7:25 AM	0	0	0	0	9	0	3	0	0	8	0	0	0	17	3	0	40	
7:30 AM	1	0	0	0	9	0	6	0	2	11	0	0	0	29	7	0	65	
7:35 AM	0	0	0	0	2	0	5	0	0	2	0	0	0	15	4	0	28	
7:40 AM	0	0	0	0	7	0	7	0	0	5	0	0	0	8	2	0	29	
7:45 AM	0	0	0	0	4	0	5	0	0	6	0	0	0	18	5	0	38	
7:50 AM	0	0	0	0	1	0	4	0	1	3	0	0	0	17	2	0	28	
7:55 AM	0	0	0	0	3	0	6	0	2	2	0	0	0	10	4	0	27	419
8:00 AM	0	0	0	0	1	0	4	0	1	6	0	0	0	12	5	0	29	430
8:05 AM	0	0	0	0	1	0	3	0	0	7	0	0	0	20	1	0	32	413
8:10 AM	0	0	0	0	4	0	3	0	0	7	0	0	0	14	2	0	30	415
8:15 AM	0	0	0	0	3	0	6	0	0	3	0	0	0	7	1	0	20	401
8:20 AM	0	0	0	0	5	0	8	0	2	4	0	0	0	12	1	0	32	398
8:25 AM	0	0	0	0	3	0	3	0	1	3	0	1	0	19	3	0	33	391
8:30 AM	0	0	0	0	1	0	4	0	0	4	0	0	0	14	2	0	25	351
8:35 AM	0	0	0	0	3	0	5	0	1	9	0	0	0	12	3	0	33	356
8:40 AM	0	0	0	0	5	0	7	0	2	3	0	0	0	13	2	0	32	359
8:45 AM	0	0	0	0	4	0	2	0	2	6	0	0	0	12	3	0	29	350
8:50 AM	0	0	0	0	4	0	7	0	0	3	0	0	0	19	4	0	37	359
8:55 AM	0	0	0	0	4	0	3	0	0	2	0	0	0	14	3	0	26	358
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Total	
All Vehicles	0	0	0	0	48	0	64	0	4	56	0	0	0	172	36	0	380	
Heavy Trucks	0	0	0	0	4	0	8	0	0	4	0	0	0	0	0	0	16	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

*Comments:*

Report generated on 4/7/2014 4:44 PM

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

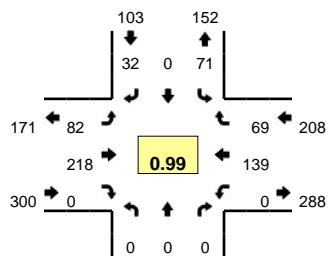
Type of peak hour being reported: System Peak

Method for determining peak hour: Total Entering Volume

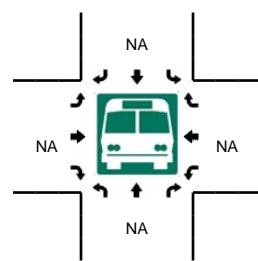
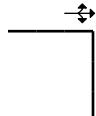
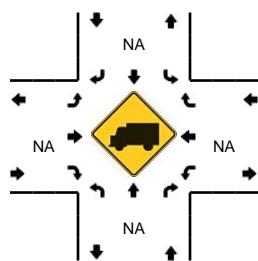
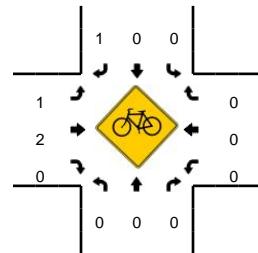
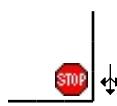
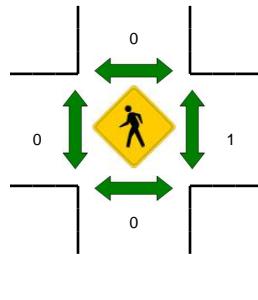
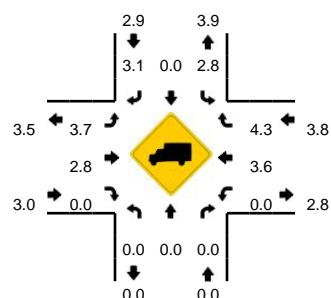
**LOCATION:** NE 242nd Ave -- NE 28th St  
**CITY/STATE:** Camas, WA

**QC JOB #:** 12470706

**DATE:** Wed, Apr 02 2014



**Peak-Hour: 4:50 PM -- 5:50 PM**  
**Peak 15-Min: 5:30 PM -- 5:45 PM**



5-Min Count Period Beginning At	NE 242nd Ave (Northbound)				NE 242nd Ave (Southbound)				NE 28th St (Eastbound)				NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	5	0	3	0	6	8	0	0	0	11	8	0	41	
4:05 PM	0	0	0	0	5	0	4	0	4	11	0	0	0	11	5	0	40	
4:10 PM	0	0	0	0	3	0	2	0	9	17	0	0	0	15	3	0	49	
4:15 PM	0	0	0	0	13	0	5	0	3	22	0	0	0	15	3	0	61	
4:20 PM	0	0	0	0	6	0	5	0	8	17	1	0	0	11	4	0	52	
4:25 PM	1	0	0	0	7	0	0	1	2	24	0	0	1	11	6	0	53	
4:30 PM	0	0	0	0	6	0	2	0	7	14	0	0	0	7	4	0	40	
4:35 PM	0	0	0	0	9	0	2	0	3	21	0	0	1	13	6	0	55	
4:40 PM	0	0	0	0	10	0	6	0	6	8	0	0	0	11	10	0	51	
4:45 PM	0	0	0	0	6	0	3	0	9	17	0	0	0	12	5	0	52	
4:50 PM	0	0	0	0	5	0	5	0	7	13	0	0	0	9	10	0	49	
4:55 PM	0	0	0	0	9	0	5	1	6	19	0	0	0	9	7	0	56	599
5:00 PM	0	0	0	0	7	0	1	0	11	16	0	0	0	10	2	0	47	605
5:05 PM	0	0	0	0	6	0	2	0	7	19	0	0	0	12	10	0	56	621
5:10 PM	0	0	0	0	3	0	0	0	3	14	0	0	0	16	6	0	42	614
5:15 PM	0	0	0	0	6	0	4	0	2	25	0	0	0	12	6	0	55	608
5:20 PM	0	0	0	0	2	0	3	0	3	16	0	0	0	12	6	0	42	598
5:25 PM	0	0	0	0	4	0	5	0	11	18	0	0	0	9	8	0	55	600
5:30 PM	0	0	0	0	5	0	0	0	9	14	0	0	0	13	3	0	44	604
5:35 PM	0	0	0	0	6	0	1	0	6	17	0	0	0	14	5	0	49	598
5:40 PM	0	0	0	0	7	0	3	0	9	26	0	0	0	12	4	0	61	608
5:45 PM	0	0	0	0	10	0	3	0	8	21	0	0	0	11	2	0	55	611
5:50 PM	0	0	0	0	3	0	3	0	7	18	0	0	0	9	9	0	49	611
5:55 PM	0	0	0	0	7	0	1	0	5	15	0	0	0	8	3	0	39	594
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound					
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Total	
All Vehicles	0	0	0	0	72	0	16	0	96	228	0	0	0	156	48	0	616	
Heavy Trucks	0	0	0	0	0	0	0	0	4	8	0	0	0	0	4	0	16	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

*Comments:*

Report generated on 4/7/2014 4:44 PM

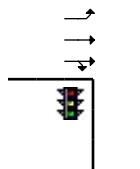
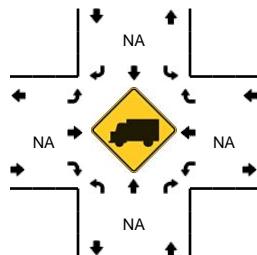
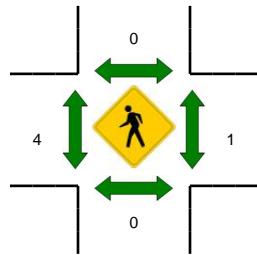
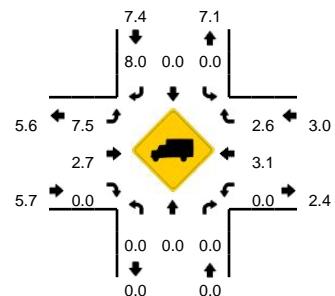
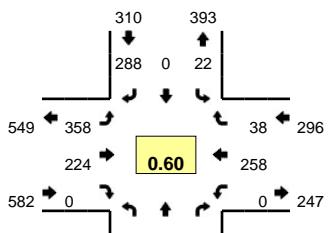
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

**LOCATION:** NW Friberg St -- NW Lake Rd  
**CITY/STATE:** Vancouver, WA

**QC JOB #:** 12426905  
**DATE:** Thu, Feb 20 2014



5-Min Count Period Beginning At	NW Friberg St (Northbound)				NW Friberg St (Southbound)				NW Lake Rd (Eastbound)				NW Lake Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	1	0	0	0	8	13	0	0	0	0	17	3	0	42
7:05 AM	0	0	0	0	2	0	4	0	12	16	0	0	0	0	12	6	0	52
7:10 AM	0	0	0	0	0	0	3	0	17	24	0	2	0	0	19	1	0	66
7:15 AM	0	0	1	0	1	0	9	0	25	9	0	0	0	0	14	0	0	59
7:20 AM	0	0	0	0	1	0	11	0	32	4	0	0	0	0	19	4	0	71
7:25 AM	0	0	0	0	2	0	38	0	53	10	0	0	0	0	9	2	0	114
7:30 AM	0	0	0	0	0	0	46	0	71	15	0	1	0	0	18	6	0	157
7:35 AM	0	0	0	0	7	0	59	0	60	17	0	0	0	0	19	5	0	167
7:40 AM	0	0	0	0	1	0	56	0	56	33	0	0	0	0	21	3	0	170
7:45 AM	0	0	0	0	1	0	41	0	15	22	0	0	0	0	39	4	0	122
7:50 AM	0	0	0	0	3	0	9	0	8	28	0	0	0	0	36	2	0	86
7:55 AM	0	0	0	0	0	0	7	0	2	21	0	0	0	0	29	3	0	62
8:00 AM	0	0	0	0	4	0	5	0	4	25	0	0	0	0	23	2	0	63
																		1168
																		1189
8:05 AM	0	0	0	0	3	0	3	0	6	6	0	0	0	0	20	1	0	39
8:10 AM	0	0	0	0	2	0	3	0	2	22	0	0	0	0	19	0	0	48
8:15 AM	0	0	0	0	2	0	4	0	3	11	0	0	0	0	17	2	0	39
8:20 AM	0	0	0	0	1	0	2	0	5	12	0	0	0	0	21	3	0	44
8:25 AM	0	0	0	0	1	0	2	0	2	13	0	0	0	0	16	0	0	34
8:30 AM	0	0	0	0	0	0	0	0	6	14	0	0	0	0	14	0	0	34
8:35 AM	0	0	0	0	2	0	2	0	14	13	0	0	0	0	19	1	0	51
8:40 AM	0	0	0	0	1	0	5	0	8	11	0	0	0	0	15	0	0	40
8:45 AM	0	0	0	0	4	0	5	0	3	20	0	0	0	0	25	2	0	59
8:50 AM	1	0	0	0	2	0	5	0	3	15	0	0	0	0	31	2	0	59
8:55 AM	0	0	0	0	2	0	6	0	5	14	0	0	0	0	30	0	0	57
																		567
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	32	0	644	0	748	260	0	4	0	232	56	0	1976	
Heavy Trucks	0	0	0	0	0	0	56	0	0	8	0	0	0	4	0	0	68	
Pedestrians	0	0	0	0	0	0	0	0	12	0	0	0	0	4	0	0	16	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments:

Report generated on 2/28/2014 10:33 AM

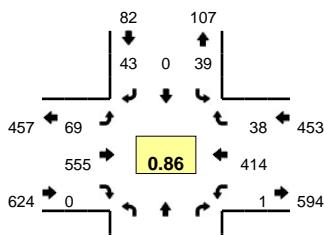
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

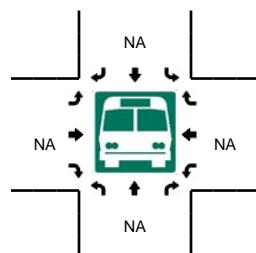
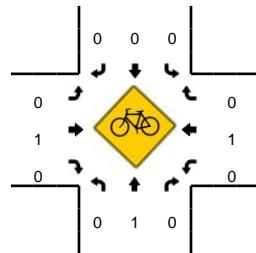
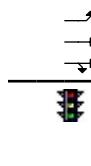
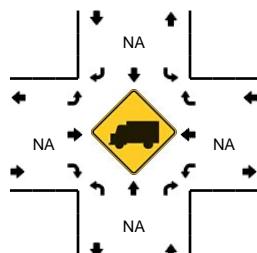
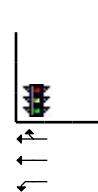
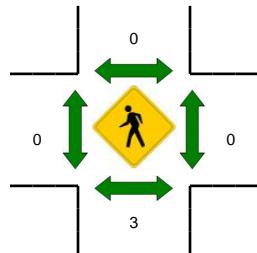
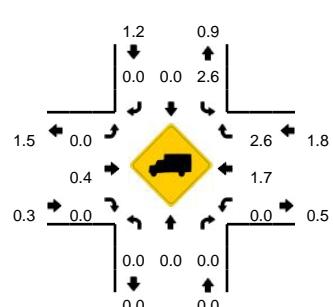
Method for determining peak hour: Total Entering Volume

**LOCATION:** NW Friberg St -- NW Lake Rd  
**CITY/STATE:** Vancouver, WA

**QC JOB #:** 12426906  
**DATE:** Tue, Feb 25 2014



**Peak-Hour: 4:45 PM -- 5:45 PM**  
**Peak 15-Min: 5:00 PM -- 5:15 PM**



5-Min Count Period Beginning At	NW Friberg St (Northbound)				NW Friberg St (Southbound)				NW Lake Rd (Eastbound)				NW Lake Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	1	0	12	0	4	31	0	0	0	53	5	0	106	
4:05 PM	0	0	0	0	1	0	12	0	5	35	0	0	0	45	3	0	101	
4:10 PM	0	1	0	0	2	0	6	0	10	34	1	0	0	33	1	0	88	
4:15 PM	0	0	0	0	0	0	8	0	6	36	0	0	0	36	1	0	87	
4:20 PM	0	0	0	0	0	0	6	0	5	29	0	0	0	26	4	0	70	
4:25 PM	0	0	0	0	0	0	6	0	5	31	0	0	0	32	4	0	78	
4:30 PM	0	0	0	0	1	0	7	0	2	38	0	0	0	26	2	0	76	
4:35 PM	0	0	0	0	1	0	4	0	6	35	0	0	0	26	2	0	74	
4:40 PM	0	0	0	0	2	0	3	0	2	38	0	1	0	35	2	0	83	
4:45 PM	0	0	0	0	5	0	2	0	2	51	0	0	1	32	1	0	94	
4:50 PM	0	0	0	0	7	0	4	0	7	40	0	0	0	32	4	0	94	
4:55 PM	0	0	0	0	1	0	4	0	5	54	0	0	0	32	2	0	98	1049
5:00 PM	0	0	0	0	3	0	8	0	2	46	0	0	0	31	5	0	95	1038
5:05 PM	0	0	0	0	3	0	5	0	6	44	0	0	0	77	4	0	139	1076
5:10 PM	0	0	0	0	3	0	2	0	8	44	0	0	0	39	6	0	102	1090
5:15 PM	0	0	0	0	2	0	3	0	5	43	0	0	0	24	4	0	81	1084
5:20 PM	0	0	0	0	2	0	3	0	9	48	0	0	0	34	0	0	96	1110
5:25 PM	0	0	0	0	2	0	4	0	8	58	0	0	0	29	6	0	107	1139
5:30 PM	0	0	0	0	2	0	1	0	7	42	0	0	0	32	2	0	86	1149
5:35 PM	0	0	0	0	6	0	2	0	2	35	0	0	0	24	2	0	71	1146
5:40 PM	0	0	0	0	3	0	5	0	8	50	0	0	0	28	2	0	96	1159
5:45 PM	0	0	0	0	2	0	3	0	7	51	0	0	0	29	2	0	94	1159
5:50 PM	0	0	0	0	1	0	4	0	10	26	0	0	0	34	3	0	78	1143
5:55 PM	0	0	0	0	0	0	4	0	3	51	0	0	0	28	2	0	88	1133
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	36	0	60	0	64	536	0	0	0	588	60	0	1344	
Heavy Trucks	0	0	0	0	0	0	0	0	0	4	0	0	0	8	0	0	12	
Pedestrians	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Bicycles	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments:

Report generated on 2/28/2014 10:39 AM

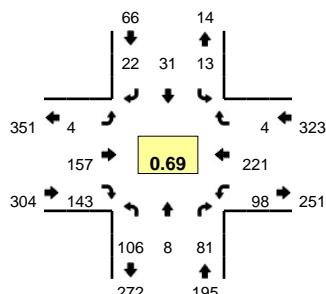
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

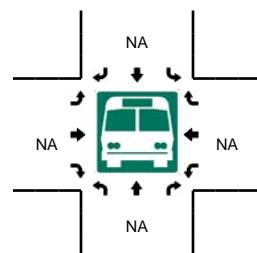
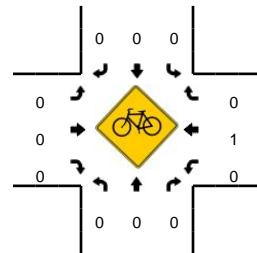
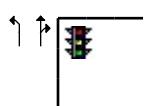
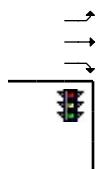
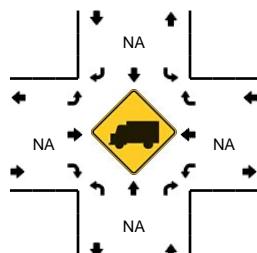
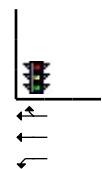
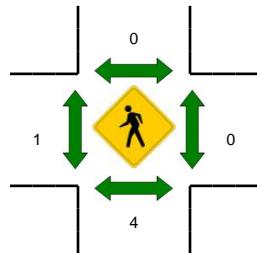
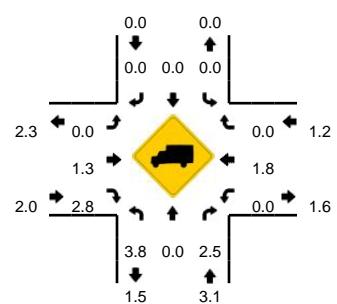
Method for determining peak hour: Total Entering Volume

**LOCATION:** NW Parker St -- NW Lake Rd  
**CITY/STATE:** Camas, WA

**QC JOB #:** 12426903  
**DATE:** Thu, Feb 20 2014



**Peak-Hour: 7:10 AM -- 8:10 AM**  
**Peak 15-Min: 7:40 AM -- 7:55 AM**



5-Min Count Period Beginning At	NW Parker St (Northbound)				NW Parker St (Southbound)				NW Lake Rd (Eastbound)				NW Lake Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	10	0	1	0	0	0	0	0	1	10	2	0	3	12	0	0	39	
7:05 AM	11	0	5	0	1	2	2	0	1	10	5	0	1	9	1	0	48	
7:10 AM	6	0	9	0	3	2	2	0	0	17	4	0	3	12	0	0	58	
7:15 AM	4	0	2	0	2	1	2	0	1	14	3	0	6	16	0	0	51	
7:20 AM	9	0	2	0	0	3	0	0	0	8	6	0	8	17	0	0	53	
7:25 AM	5	1	1	0	0	1	3	0	0	6	10	0	5	14	0	0	46	
7:30 AM	9	0	4	0	1	4	0	0	0	11	7	0	7	20	1	0	64	
7:35 AM	10	0	4	0	0	2	1	0	0	14	14	0	8	15	1	0	69	
7:40 AM	10	0	11	0	1	6	4	0	0	10	21	1	15	25	1	0	105	
7:45 AM	14	1	13	0	0	2	2	0	1	19	16	0	14	23	0	0	105	
7:50 AM	13	2	16	0	1	3	0	0	0	15	20	0	8	32	0	0	110	
7:55 AM	11	3	9	0	2	2	2	0	0	16	15	0	10	18	0	0	88	836
8:00 AM	7	1	8	0	2	1	3	0	0	15	21	0	6	19	1	0	84	881
8:05 AM	8	0	2	0	1	4	3	0	0	12	6	1	8	10	0	0	55	888
8:10 AM	2	1	2	0	1	0	1	0	0	14	11	0	4	19	0	0	55	885
8:15 AM	5	0	1	0	1	2	1	0	0	12	6	0	4	17	1	0	50	884
8:20 AM	5	0	4	0	1	3	2	0	0	7	6	0	2	18	0	0	48	879
8:25 AM	1	0	6	0	1	0	2	0	0	10	3	0	2	11	0	0	36	869
8:30 AM	1	0	1	0	0	1	2	0	1	8	9	0	3	18	0	0	44	849
8:35 AM	8	0	2	0	0	3	0	0	1	9	8	0	6	16	0	0	53	833
8:40 AM	4	1	5	0	0	1	1	0	0	7	6	0	3	15	1	0	44	772
8:45 AM	12	0	1	0	1	1	2	0	1	16	4	0	4	16	0	0	58	725
8:50 AM	11	0	3	0	1	0	2	0	0	13	4	0	8	22	0	0	64	679
8:55 AM	8	0	4	0	0	1	2	0	1	12	6	0	2	32	1	0	69	660
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Total	
All Vehicles	148	12	160	0	8	44	24	0	4	176	228	4	148	320	4	0	1280	
Heavy Trucks	8	0	4		0	0	0		0	0	4	0	0	0	0		20	
Pedestrians	8																8	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

*Comments:*

Report generated on 2/28/2014 10:33 AM

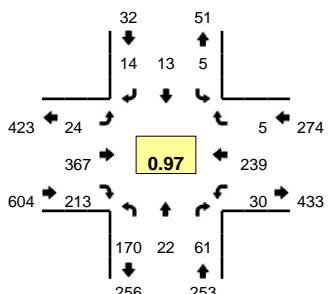
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

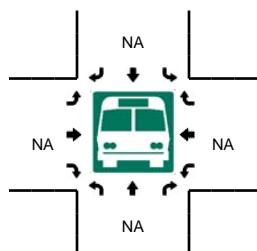
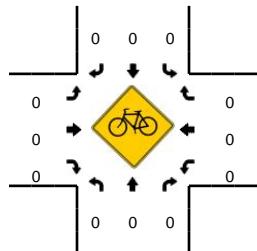
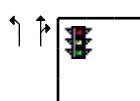
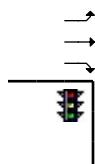
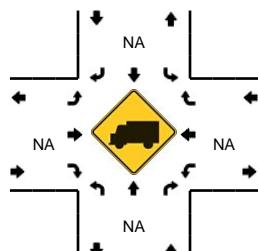
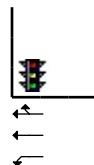
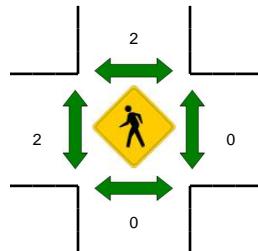
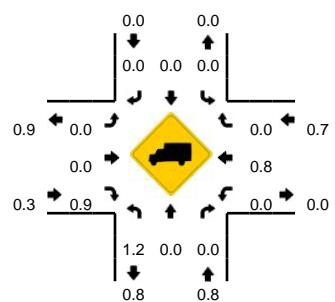
Method for determining peak hour: Total Entering Volume

**LOCATION:** NW Parker St -- NW Lake Rd  
**CITY/STATE:** Camas, WA

**QC JOB #:** 12426904  
**DATE:** Thu, Feb 20 2014



**Peak-Hour: 4:45 PM -- 5:45 PM**  
**Peak 15-Min: 5:30 PM -- 5:45 PM**



5-Min Count Period Beginning At	NW Parker St (Northbound)				NW Parker St (Southbound)				NW Lake Rd (Eastbound)				NW Lake Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	11	3	3	0	3	1	2	0	0	27	8	0	5	18	0	0	81	
4:05 PM	9	1	7	0	1	5	1	0	2	27	7	0	1	26	0	0	87	
4:10 PM	9	1	6	0	0	0	1	0	2	24	9	1	3	20	0	0	76	
4:15 PM	7	2	7	0	0	1	1	0	2	22	7	0	5	14	2	0	70	
4:20 PM	6	4	5	0	0	0	1	0	2	33	10	0	5	18	1	0	85	
4:25 PM	7	2	2	0	0	0	1	0	1	32	9	2	2	20	0	0	78	
4:30 PM	9	2	1	0	0	0	2	0	0	24	12	0	2	21	0	0	73	
4:35 PM	7	0	2	0	0	0	2	0	1	34	14	0	6	25	0	0	91	
4:40 PM	6	1	3	0	0	2	1	0	1	26	7	0	3	26	0	0	76	
4:45 PM	9	1	7	0	0	1	2	0	2	31	16	0	3	16	0	0	88	
4:50 PM	24	1	1	0	0	1	1	0	2	34	22	0	0	16	0	0	102	
4:55 PM	17	3	5	0	1	2	0	0	5	31	15	0	3	14	1	0	97	1004
5:00 PM	12	1	4	0	2	1	5	0	3	35	11	0	0	24	0	0	98	1021
5:05 PM	11	1	3	0	0	1	0	0	1	24	17	0	1	29	0	0	88	1022
5:10 PM	17	2	8	0	0	0	1	0	4	26	20	0	5	19	0	0	102	1048
5:15 PM	18	2	3	0	0	0	0	0	3	38	10	0	0	17	0	0	91	1069
5:20 PM	13	3	9	0	0	1	1	0	1	23	20	0	3	24	1	0	99	1083
5:25 PM	15	2	4	0	1	3	1	0	0	37	15	0	3	14	2	0	97	1102
5:30 PM	10	4	6	0	0	0	3	0	1	32	22	0	3	21	1	0	103	1132
5:35 PM	13	2	4	0	0	2	0	0	0	28	22	0	1	25	0	0	97	1138
5:40 PM	11	0	7	0	1	1	0	0	2	28	23	0	8	20	0	0	101	1163
5:45 PM	16	1	3	0	0	0	2	0	0	22	18	0	2	20	1	0	85	1160
5:50 PM	18	1	3	0	0	0	4	0	2	24	8	0	1	20	0	0	81	1139
5:55 PM	18	2	3	0	1	1	0	0	5	30	8	1	3	17	0	0	89	1131
<b>Peak 15-Min Flowrates</b>	<b>Northbound</b>				<b>Southbound</b>				<b>Eastbound</b>				<b>Westbound</b>					
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	<b>Total</b>	
All Vehicles	136	24	68	0	4	12	12	0	12	352	268	0	48	264	4	0	1204	
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	4	0		4	
Pedestrians	0									8				0			8	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

**Comments:**

Report generated on 2/28/2014 10:39 AM

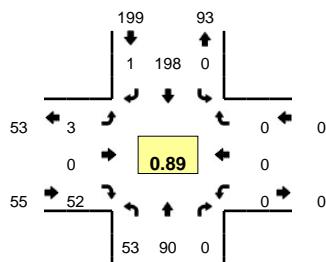
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

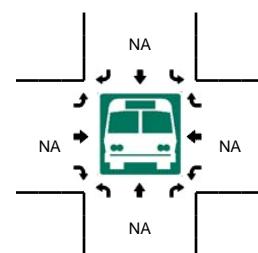
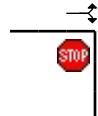
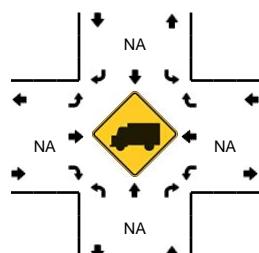
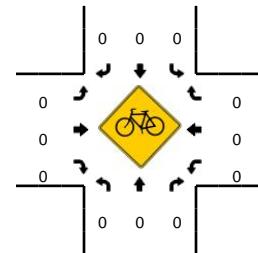
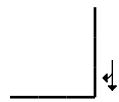
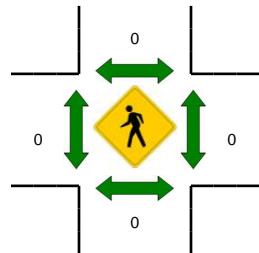
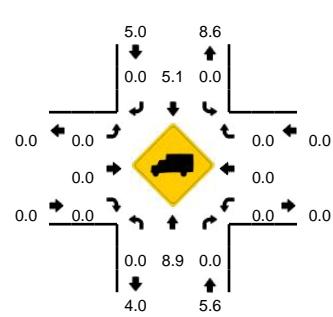
Method for determining peak hour: Total Entering Volume

**LOCATION:** NE Everett St -- SE Leadbetter Rd  
**CITY/STATE:** Camas, WA

**QC JOB #:** 12426901  
**DATE:** Thu, Feb 20 2014



**Peak-Hour: 7:05 AM -- 8:05 AM**  
**Peak 15-Min: 7:10 AM -- 7:25 AM**



5-Min Count Period Beginning At	NE Everett St (Northbound)				NE Everett St (Southbound)				SE Leadbetter Rd (Eastbound)				SE Leadbetter Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	5	8	0	0	0	7	0	0	0	0	3	0	0	0	0	0	23	
7:05 AM	1	6	0	0	0	15	0	0	1	0	4	0	0	0	0	0	27	
7:10 AM	6	7	0	0	0	20	0	0	0	0	8	0	0	0	0	0	41	
7:15 AM	6	4	0	0	0	12	0	0	1	0	4	0	0	0	0	0	27	
7:20 AM	4	5	0	1	0	28	0	0	0	0	5	0	0	0	0	0	43	
7:25 AM	5	7	0	0	0	12	0	0	1	0	4	0	0	0	0	0	29	
7:30 AM	4	6	0	0	0	12	1	0	0	0	4	0	0	0	0	0	27	
7:35 AM	3	9	0	0	0	20	0	0	0	0	2	0	0	0	0	0	34	
7:40 AM	5	10	0	0	0	15	0	0	0	0	3	0	0	0	0	0	33	
7:45 AM	8	4	0	0	0	23	0	0	0	0	6	0	0	0	0	0	41	
7:50 AM	2	12	0	0	0	17	0	0	0	0	5	0	0	0	0	0	36	
7:55 AM	5	12	0	0	0	14	0	0	0	0	1	0	0	0	0	0	32	393
8:00 AM	3	8	0	0	0	10	0	0	0	0	6	0	0	0	0	0	27	397
8:05 AM	1	14	0	0	0	6	0	0	0	0	4	0	0	0	0	0	25	395
8:10 AM	0	6	0	0	0	8	0	0	0	0	5	0	0	0	0	0	19	373
8:15 AM	2	5	0	0	0	15	0	0	1	0	1	0	0	0	0	0	24	370
8:20 AM	2	8	0	0	0	7	0	0	1	0	2	0	0	0	0	0	20	347
8:25 AM	0	11	0	0	0	15	0	0	0	0	3	0	0	0	0	0	29	347
8:30 AM	1	17	0	0	0	13	0	0	0	0	1	0	0	0	0	0	32	352
8:35 AM	1	17	0	0	0	18	0	0	1	0	1	0	0	0	0	0	38	356
8:40 AM	1	20	0	0	0	23	0	0	2	0	2	0	0	0	0	0	48	371
8:45 AM	3	6	0	0	0	32	0	0	1	0	2	0	0	0	0	0	44	374
8:50 AM	2	21	0	0	0	17	0	0	1	0	4	0	0	0	0	0	45	383
8:55 AM	1	3	0	0	0	20	1	0	0	0	2	0	0	0	0	0	27	378
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound					
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Total	
All Vehicles	64	64	0	4	0	240	0	0	4	0	68	0	0	0	0	0	444	
Heavy Trucks	0	4	0		0	32	0		0	0	0		0	0	0	0	36	
Pedestrians	0				0				0				0			0	0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0	0	0	
Railroad																		
Stopped Buses																		

*Comments:*

Report generated on 2/28/2014 10:33 AM

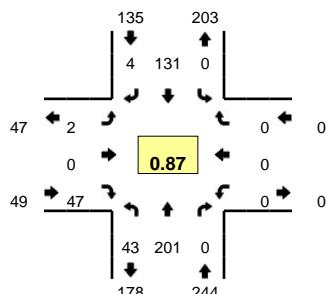
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

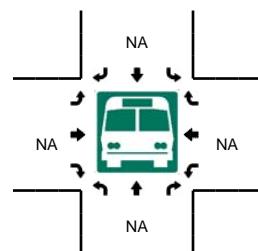
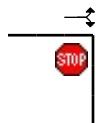
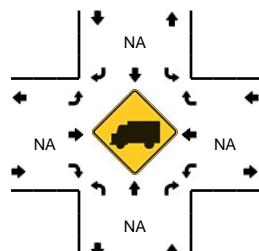
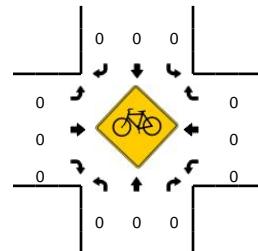
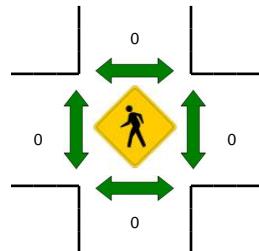
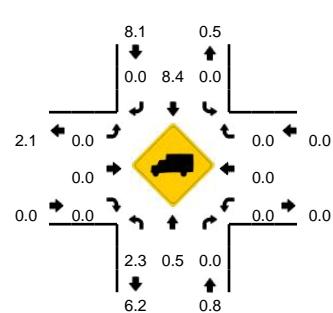
Method for determining peak hour: Total Entering Volume

**LOCATION:** NE Everett St -- SE Leadbetter Rd  
**CITY/STATE:** Camas, WA

**QC JOB #:** 12426902  
**DATE:** Thu, Feb 20 2014



**Peak-Hour: 4:00 PM -- 5:00 PM**  
**Peak 15-Min: 4:20 PM -- 4:35 PM**



5-Min Count Period Beginning At	NE Everett St (Northbound)				NE Everett St (Southbound)				SE Leadbetter Rd (Eastbound)				SE Leadbetter Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	14	0	0	0	11	0	0	0	0	6	0	0	0	0	0	33	
4:05 PM	6	19	0	0	0	10	0	0	0	0	4	0	0	0	0	0	39	
4:10 PM	6	11	0	0	0	13	0	0	0	0	2	0	0	0	0	0	32	
4:15 PM	2	20	0	0	0	11	1	0	1	0	0	0	0	0	0	0	35	
4:20 PM	4	15	0	0	0	15	0	0	1	0	2	0	0	0	0	0	37	
4:25 PM	3	17	0	0	0	16	1	0	0	0	12	0	0	0	0	0	49	
4:30 PM	5	19	0	0	0	11	0	0	0	0	2	0	0	0	0	0	37	
4:35 PM	1	17	0	0	0	11	0	0	0	0	2	0	0	0	0	0	31	
4:40 PM	4	18	0	0	0	5	1	0	0	0	2	0	0	0	0	0	30	
4:45 PM	3	16	0	0	0	8	1	0	0	0	4	0	0	0	0	0	32	
4:50 PM	4	21	0	0	0	9	0	0	0	0	5	0	0	0	0	0	39	
4:55 PM	3	14	0	0	0	11	0	0	0	0	6	0	0	0	0	0	34	428
5:00 PM	4	12	0	0	0	8	0	0	0	0	1	0	0	0	0	0	25	420
5:05 PM	3	17	0	0	0	9	0	0	0	0	1	0	0	0	0	0	30	411
5:10 PM	5	18	0	0	0	8	0	0	0	0	4	0	0	0	0	0	35	414
5:15 PM	1	19	0	0	0	9	0	0	0	0	3	0	0	0	0	0	32	411
5:20 PM	4	16	0	0	0	10	0	0	0	0	6	0	0	0	0	0	36	410
5:25 PM	2	17	0	0	0	8	0	0	0	0	3	0	0	0	0	0	30	391
5:30 PM	3	12	0	0	0	8	0	0	0	0	2	0	0	0	0	0	25	379
5:35 PM	3	26	0	0	0	10	0	0	0	0	3	0	0	0	0	0	42	390
5:40 PM	4	17	0	0	0	8	0	0	0	0	3	0	0	0	0	0	32	392
5:45 PM	1	11	0	0	0	14	1	0	0	0	3	0	0	0	0	0	30	390
5:50 PM	1	12	0	0	0	12	0	0	0	0	7	0	0	0	0	0	32	383
5:55 PM	2	20	0	0	0	6	0	0	0	0	2	0	0	0	0	0	30	379
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound					
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Total	
All Vehicles	48	204	0	0	0	168	4	0	4	0	64	0	0	0	0	0	492	
Heavy Trucks	0	0	0	0	0	32	0	0	0	0	0	0	0	0	0		32	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	
Railroad																		
Stopped Buses																		

Comments:

Report generated on 2/28/2014 10:39 AM

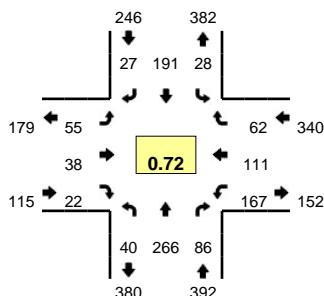
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: System Peak

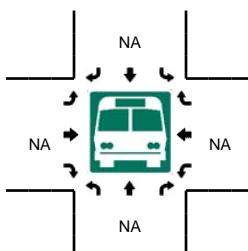
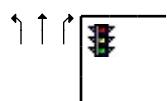
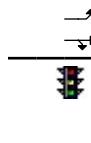
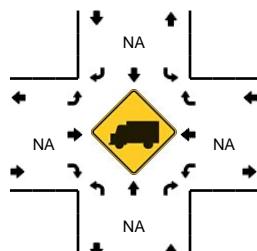
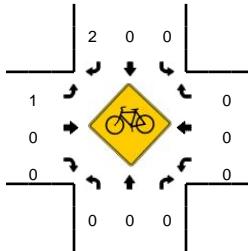
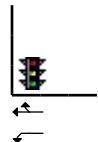
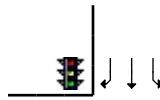
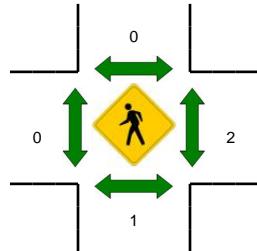
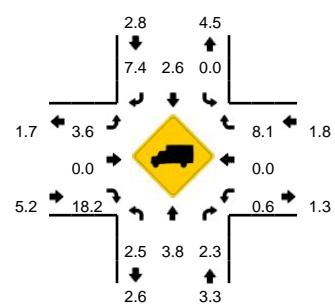
Method for determining peak hour: Total Entering Volume

**LOCATION:** NW Parker St -- NW 38th Ave  
**CITY/STATE:** Camas, WA

**QC JOB #:** 12470703  
**DATE:** Thu, Apr 03 2014



**Peak-Hour: 7:05 AM -- 8:05 AM**  
**Peak 15-Min: 7:40 AM -- 7:55 AM**



5-Min Count Period Beginning At	NW Parker St (Northbound)				NW Parker St (Southbound)				NW 38th Ave (Eastbound)				NW 38th Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	5	12	2	0	2	10	5	0	1	1	1	0	11	8	1	0	59	
7:05 AM	2	9	7	0	0	7	1	0	3	2	1	0	11	10	1	0	54	
7:10 AM	4	17	8	0	0	10	2	0	2	2	1	0	10	6	2	0	64	
7:15 AM	3	10	7	0	0	10	1	0	2	3	0	0	14	6	1	0	57	
7:20 AM	1	11	1	0	0	8	0	0	1	4	1	0	16	9	1	0	53	
7:25 AM	4	16	6	0	2	8	1	0	1	4	2	0	12	7	1	0	64	
7:30 AM	4	24	5	0	0	14	3	0	2	5	4	0	9	7	5	0	82	
7:35 AM	8	18	6	0	1	14	2	0	10	6	1	0	13	15	8	0	102	
7:40 AM	3	40	4	0	4	13	3	0	5	0	4	0	12	11	11	0	110	
7:45 AM	3	44	3	0	4	23	4	0	9	4	1	1	9	8	9	0	122	
7:50 AM	3	37	17	0	4	30	3	0	6	4	1	0	16	7	17	0	145	
7:55 AM	3	20	16	0	3	33	6	0	7	2	4	0	23	12	5	0	134	1046
8:00 AM	2	20	6	0	10	21	1	0	6	2	2	0	22	13	1	0	106	1093
8:05 AM	6	14	7	0	1	15	1	0	1	2	0	0	16	17	4	0	84	1123
8:10 AM	2	14	3	0	2	10	1	0	2	5	0	0	6	6	0	0	51	1110
8:15 AM	2	8	6	0	1	11	0	0	5	5	5	0	11	6	1	0	61	1114
8:20 AM	4	9	2	0	0	13	3	0	3	2	0	0	8	6	0	0	50	1111
8:25 AM	4	14	6	0	1	11	1	0	2	2	1	0	16	8	2	0	68	1115
8:30 AM	0	13	4	0	1	4	2	0	4	1	0	0	8	5	1	0	43	1076
8:35 AM	5	8	8	0	1	8	1	0	4	3	0	0	11	12	2	0	63	1037
8:40 AM	5	12	11	0	0	8	1	0	3	4	2	0	12	9	0	0	67	994
8:45 AM	3	6	9	0	1	5	1	0	3	6	0	0	11	11	2	0	58	930
8:50 AM	3	12	13	0	2	7	2	0	0	10	1	0	11	15	1	0	77	862
8:55 AM	5	9	12	0	0	7	1	0	1	5	4	0	26	12	0	0	82	810
<b>Peak 15-Min Flowrates</b>	Northbound				Southbound				Eastbound				Westbound				<b>Total</b>	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	36	484	96	0	48	264	40	0	80	32	24	4	148	104	148	0	1508	
Heavy Trucks	0	20	4	0	0	4	4	0	0	0	4	0	0	8	0	0	44	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

*Comments:*

Report generated on 4/7/2014 4:44 PM

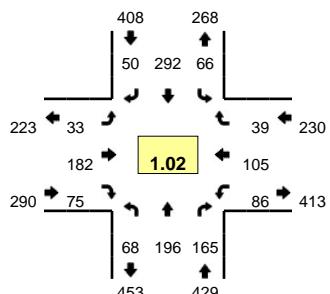
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: System Peak

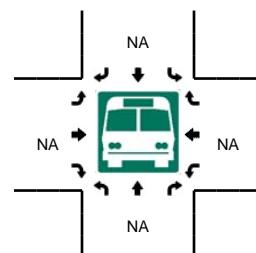
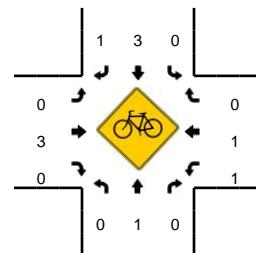
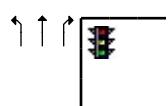
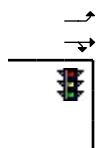
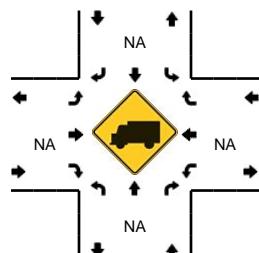
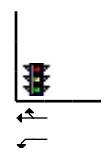
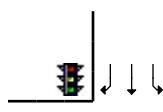
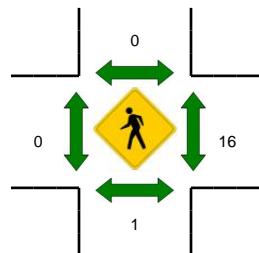
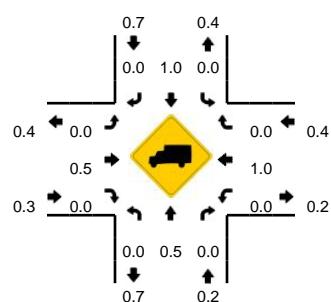
Method for determining peak hour: Total Entering Volume

**LOCATION:** NW Parker St -- NW 38th Ave  
**CITY/STATE:** Camas, WA

**QC JOB #:** 12470704  
**DATE:** Wed, Apr 02 2014



**Peak-Hour: 4:50 PM -- 5:50 PM**  
**Peak 15-Min: 5:30 PM -- 5:45 PM**



5-Min Count Period	NW Parker St (Northbound)				NW Parker St (Southbound)				NW 38th Ave (Eastbound)				NW 38th Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	4	16	11	0	1	15	3	0	2	6	1	0	5	8	2	0	74	
4:05 PM	2	10	13	0	3	15	0	0	4	15	2	0	6	8	3	0	81	
4:10 PM	4	14	14	0	2	11	2	0	3	16	3	0	8	7	3	0	87	
4:15 PM	5	15	13	0	2	13	6	0	2	10	1	0	9	5	5	0	86	
4:20 PM	3	20	12	0	3	9	0	0	1	16	7	0	6	6	3	0	86	
4:25 PM	3	29	12	0	3	12	2	0	6	13	7	0	2	8	7	0	104	
4:30 PM	5	30	11	0	2	13	2	0	7	16	1	0	2	6	9	0	104	
4:35 PM	4	17	13	0	4	24	2	0	5	11	5	0	11	10	6	0	112	
4:40 PM	3	33	19	0	8	31	2	0	4	12	5	0	14	14	3	0	148	
4:45 PM	3	25	8	0	10	27	4	0	3	18	4	0	10	9	8	0	129	
4:50 PM	9	22	14	0	9	45	2	0	2	7	5	0	7	18	3	0	143	
4:55 PM	4	16	7	0	9	41	3	0	2	8	10	0	2	7	5	0	114	1268
5:00 PM	6	13	15	0	11	17	4	0	1	14	4	0	8	15	5	0	113	1307
5:05 PM	3	10	13	0	3	27	1	0	2	16	6	0	6	2	1	0	90	1316
5:10 PM	7	13	12	0	5	23	4	0	4	22	6	0	10	11	4	0	121	1350
5:15 PM	4	20	19	0	1	20	4	0	3	19	8	0	6	9	5	0	118	1382
5:20 PM	9	23	11	0	4	22	9	0	5	13	5	0	9	6	2	0	118	1414
5:25 PM	2	21	9	0	10	14	7	0	4	18	6	0	7	12	1	0	111	1421
5:30 PM	7	21	13	0	2	25	5	0	3	14	4	0	9	9	2	0	114	1431
5:35 PM	4	16	15	0	3	17	3	0	3	17	11	0	9	3	3	0	104	1423
5:40 PM	5	12	18	0	4	27	3	0	3	19	5	0	5	7	5	0	113	1388
5:45 PM	8	9	19	0	5	14	5	0	1	15	5	0	8	6	3	0	98	1357
5:50 PM	6	11	13	0	4	15	5	0	1	11	4	0	14	9	2	0	95	1309
5:55 PM	0	12	11	0	5	12	2	0	4	20	6	0	8	7	0	0	87	1282
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	64	196	184	0	36	276	44	0	36	200	80	0	92	76	40	0	1324	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Pedestrians	0															20		
Bicycles	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1		
Railroad																		
Stopped Buses																		

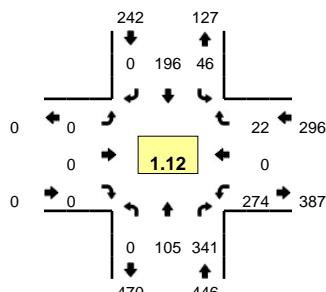
### *Comments:*

Type of peak hour being reported: System Peak

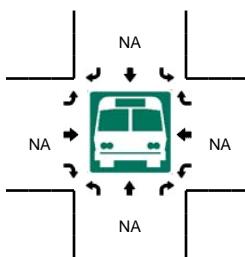
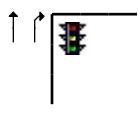
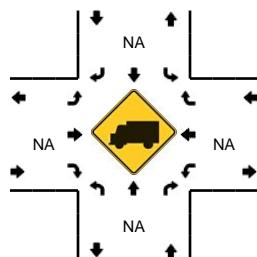
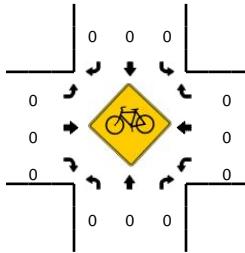
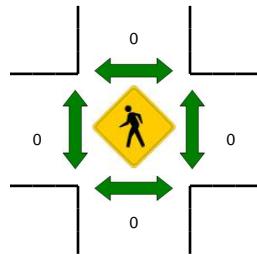
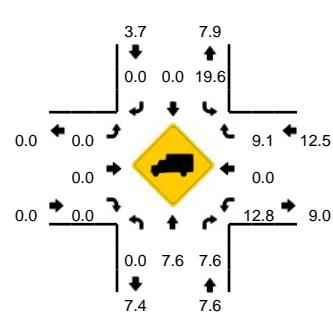
Method for determining peak hour: Total Entering Volume

**LOCATION:** NE Everett St -- NE 43rd Ave  
**CITY/STATE:** Camas, WA

**QC JOB #:** 12470701  
**DATE:** Thu, Apr 03 2014



**Peak-Hour: 7:05 AM -- 8:05 AM**  
**Peak 15-Min: 7:40 AM -- 7:55 AM**



5-Min Count Period Beginning At	NE Everett St (Northbound)				NE Everett St (Southbound)				NE 43rd Ave (Eastbound)				NE 43rd Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	6	28	0	2	12	0	0	0	0	0	0	7	0	1	0	56	
7:05 AM	0	11	44	0	3	10	0	0	0	0	0	0	9	0	1	0	78	
7:10 AM	0	5	55	0	7	11	0	0	0	0	0	0	14	0	2	0	94	
7:15 AM	0	10	45	0	5	19	0	0	0	0	0	0	29	0	1	0	109	
7:20 AM	0	4	59	0	14	17	0	0	0	0	0	0	26	0	1	0	121	
7:25 AM	0	8	46	0	10	16	0	0	0	0	0	0	37	0	2	0	119	
7:30 AM	0	7	26	0	2	17	0	0	0	0	0	0	34	0	2	0	88	
7:35 AM	0	11	10	0	0	24	0	0	0	0	0	0	29	0	5	0	79	
7:40 AM	0	8	19	0	2	15	0	0	0	0	0	0	48	0	5	0	97	
7:45 AM	0	11	11	0	0	26	0	0	0	0	0	0	27	0	2	0	77	
7:50 AM	0	13	5	0	1	15	0	0	0	0	0	0	11	0	0	0	45	
7:55 AM	0	11	12	0	0	20	0	0	0	0	0	0	5	0	1	0	49	1012
8:00 AM	0	6	9	0	2	6	0	0	0	0	0	0	5	0	0	0	28	984
8:05 AM	0	8	6	0	0	10	0	0	0	0	0	0	3	0	0	0	27	933
8:10 AM	0	5	2	0	0	6	0	0	0	0	0	0	3	0	2	0	18	857
8:15 AM	0	11	7	0	0	14	0	0	0	0	0	0	3	0	0	0	35	783
8:20 AM	0	5	9	0	1	15	0	0	0	0	0	0	2	0	0	0	32	694
8:25 AM	0	3	9	0	0	16	0	0	0	0	0	0	3	0	1	0	32	607
8:30 AM	0	7	6	0	1	11	0	0	0	0	0	0	9	0	1	0	35	554
8:35 AM	0	4	6	0	1	11	0	0	0	0	0	0	10	0	1	0	33	508
8:40 AM	0	5	7	0	4	13	0	0	0	0	0	0	10	0	1	0	40	451
8:45 AM	0	5	6	0	2	10	0	0	0	0	0	0	13	0	2	0	38	412
8:50 AM	0	8	7	0	1	23	0	0	0	0	0	0	15	0	2	0	56	423
8:55 AM	0	12	6	0	0	14	0	0	0	0	0	0	14	0	3	0	49	423

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	128	140	0	12	224	0	0	0	0	0	0	344	0	28	0	876
Heavy Trucks	0	8	16	0	0	0	0	0	0	0	0	0	24	0	0	0	48
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments:

Report generated on 4/7/2014 4:44 PM

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

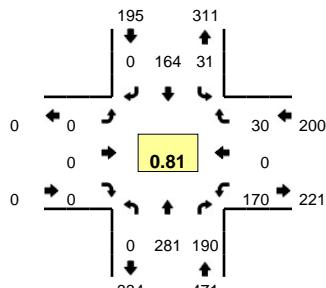
Type of peak hour being reported: System Peak

Method for determining peak hour: Total Entering Volume

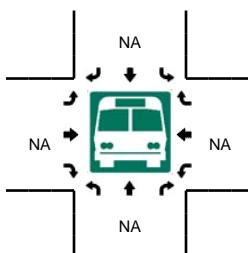
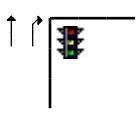
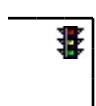
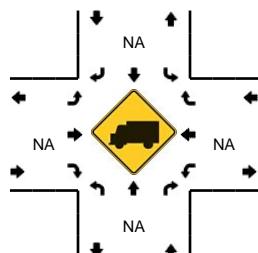
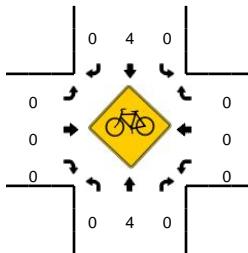
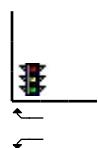
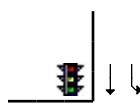
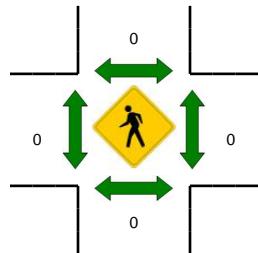
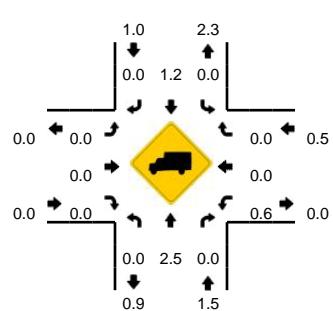
**LOCATION:** NE Everett St -- NE 43rd Ave  
**CITY/STATE:** Camas, WA

QC JOB #: 12470702

**DATE:** Wed, Apr 02 2014



**Peak-Hour: 4:50 PM -- 5:50 PM**  
**Peak 15-Min: 5:30 PM -- 5:45 PM**



5-Min Count Period Beginning At	NE Everett St (Northbound)				NE Everett St (Southbound)				NE 43rd Ave (Eastbound)				NE 43rd Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	23	14	0	2	14	0	0	0	0	0	0	17	0	2	0	72	
4:05 PM	0	19	10	0	3	6	0	0	0	0	0	0	14	0	0	0	52	
4:10 PM	0	24	16	0	5	18	0	0	0	0	0	0	8	0	3	0	74	
4:15 PM	0	22	10	0	0	15	0	0	0	0	0	0	13	0	0	0	60	
4:20 PM	0	21	12	0	2	11	0	0	0	0	0	0	11	0	1	0	58	
4:25 PM	0	20	10	0	3	17	0	0	0	0	0	0	7	0	3	0	60	
4:30 PM	0	16	11	0	3	17	0	0	0	0	0	0	13	0	6	0	66	
4:35 PM	0	22	14	0	2	23	0	0	0	0	0	0	13	0	1	0	75	
4:40 PM	0	15	6	0	1	24	0	0	0	0	0	0	10	0	0	0	56	
4:45 PM	0	16	8	0	1	20	0	0	0	0	0	0	10	0	1	0	56	
4:50 PM	0	32	14	0	1	13	0	0	0	0	0	0	9	0	3	0	72	
4:55 PM	0	21	18	0	1	7	0	0	0	0	0	0	10	0	1	0	58	759
5:00 PM	0	17	20	0	3	16	0	0	0	0	0	0	7	0	0	0	63	750
5:05 PM	0	22	17	0	1	14	0	0	0	0	0	0	9	0	1	0	64	762
5:10 PM	0	25	15	0	1	5	0	0	0	0	0	0	12	0	1	0	59	747
5:15 PM	0	30	15	0	5	15	0	0	0	0	0	0	9	0	1	0	75	762
5:20 PM	0	24	21	0	2	11	0	0	0	0	0	0	8	0	1	0	67	771
5:25 PM	0	27	6	0	2	6	0	0	0	0	0	0	7	0	1	0	49	760
5:30 PM	0	25	15	0	5	22	0	0	0	0	0	0	21	0	9	0	97	791
5:35 PM	0	19	16	0	3	19	0	0	0	0	0	0	22	0	2	0	81	797
5:40 PM	0	18	13	0	4	17	0	0	0	0	0	0	33	0	4	0	89	830
5:45 PM	0	21	20	0	3	19	0	0	0	0	0	0	23	0	6	0	92	866
5:50 PM	0	19	17	0	2	16	0	0	0	0	0	0	34	0	7	0	95	889
5:55 PM	0	15	11	0	1	11	0	0	0	0	0	0	19	0	1	0	58	889
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	248	176	0	48	232	0	0	0	0	0	0	304	0	60	0	1068	
Heavy Trucks	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0	8		
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Bicycles	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	4		
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			

### *Comments:*

## Appendix D Existing Conditions Worksheets



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Volume (veh/h)	53	179	13	183	152	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	62	208	15	213	177	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		270		409	166	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		270		409	166	
tC, single (s)		4.1		6.4	7.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	4.2	
p0 queue free %		99		70	100	
cM capacity (veh/h)		1305		588	677	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	270	228	178			
Volume Left	0	15	177			
Volume Right	208	0	1			
cSH	1700	1305	589			
Volume to Capacity	0.16	0.01	0.30			
Queue Length 95th (ft)	0	1	32			
Control Delay (s)	0.0	0.6	13.7			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.6	13.7			
Approach LOS			B			
Intersection Summary						
Average Delay		3.8				
Intersection Capacity Utilization		35.5%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Volume (vph)	168	212	260	68	544	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8		5.4		5.7	5.4
Lane Util. Factor	1.00		1.00		1.00	1.00
Fr <sub>t</sub>	0.92		0.97		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1603		1644		1805	1881
Flt Permitted	0.98		1.00		0.28	1.00
Satd. Flow (perm)	1603		1644		535	1881
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	168	212	260	68	544	288
RTOR Reduction (vph)	30	0	8	0	0	0
Lane Group Flow (vph)	350	0	320	0	544	288
Heavy Vehicles (%)	0%	13%	14%	6%	0%	1%
Turn Type				pm+pt		
Protected Phases	6		4		3	8
Permitted Phases					8	
Actuated Green, G (s)	24.8		22.4		48.0	48.0
Effective Green, g (s)	24.8		22.4		48.0	48.0
Actuated g/C Ratio	0.30		0.27		0.57	0.57
Clearance Time (s)	5.8		5.4		5.7	5.4
Vehicle Extension (s)	1.0		1.0		1.0	1.0
Lane Grp Cap (vph)	473		438		607	1075
v/s Ratio Prot	c0.22		0.19		c0.21	0.15
v/s Ratio Perm					c0.30	
v/c Ratio	0.74		0.73		0.90	0.27
Uniform Delay, d1	26.7		28.1		13.7	9.1
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	5.4		5.3		15.4	0.0
Delay (s)	32.1		33.4		29.1	9.2
Level of Service	C		C		C	A
Approach Delay (s)	32.1		33.4			22.2
Approach LOS	C		C			C
Intersection Summary						
HCM Average Control Delay		27.0		HCM Level of Service		C
HCM Volume to Capacity ratio		0.82				
Actuated Cycle Length (s)		84.0		Sum of lost time (s)		11.5
Intersection Capacity Utilization		84.1%		ICU Level of Service		E
Analysis Period (min)		15				

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	105	279	100	223	1	84	2	28	2	5	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Fr <sub>t</sub>		0.90			1.00			0.97			0.97	
Flt Protected		1.00			0.98			0.96			0.99	
Satd. Flow (prot)		1676			1770			1589			1486	
Flt Permitted		1.00			0.74			0.77			0.95	
Satd. Flow (perm)		1675			1332			1275			1424	
Peak-hour factor, PHF	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Adj. Flow (vph)	2	159	423	152	338	2	127	3	42	3	8	3
RTOR Reduction (vph)	0	104	0	0	0	0	0	14	0	0	2	0
Lane Group Flow (vph)	0	481	0	0	492	0	0	158	0	0	12	0
Confl. Peds. (#/hr)	1				1							
Heavy Vehicles (%)	100%	7%	0%	8%	4%	100%	11%	0%	14%	0%	40%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	30.5			30.5			12.7			12.7		
Effective Green, g (s)	30.5			30.5			12.7			12.7		
Actuated g/C Ratio	0.60			0.60			0.25			0.25		
Clearance Time (s)	4.0			4.0			4.0			4.0		
Vehicle Extension (s)	3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)	998			793			316			353		
v/s Ratio Prot												
v/s Ratio Perm	0.29			c0.37			c0.12			0.01		
v/c Ratio	0.48			0.62			0.50			0.03		
Uniform Delay, d1	5.9			6.6			16.5			14.6		
Progression Factor	1.00			1.00			1.00			1.00		
Incremental Delay, d2	0.4			1.5			1.2			0.0		
Delay (s)	6.2			8.2			17.8			14.6		
Level of Service	A			A			B			B		
Approach Delay (s)	6.2			8.2			17.8			14.6		
Approach LOS	A			A			B			B		

Intersection Summary			
HCM Average Control Delay	8.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	51.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	52	64	209	104	36	169
Sign Control	Free	Free		Stop		
Grade	0%	0%		0%		
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	58	72	235	117	40	190
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None	None				
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	352			482	293	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	352			482	293	
tC, single (s)	4.2			6.5	6.2	
tC, 2 stage (s)						
tF (s)	2.3			3.6	3.3	
p0 queue free %	95			92	74	
cM capacity (veh/h)	1175			506	739	
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	130	352	40	190		
Volume Left	58	0	40	0		
Volume Right	0	117	0	190		
cSH	1175	1700	506	739		
Volume to Capacity	0.05	0.21	0.08	0.26		
Queue Length 95th (ft)	4	0	6	26		
Control Delay (s)	3.9	0.0	12.7	11.5		
Lane LOS	A		B	B		
Approach Delay (s)	3.9	0.0	11.8			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay		4.5				
Intersection Capacity Utilization	36.9%		ICU Level of Service		A	
Analysis Period (min)		15				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	58	41	4	234	0	64	1	3	0	2	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	63	45	4	254	0	70	1	3	0	2	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	254			108			356	351	85	354	373	254
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	254			108			356	351	85	354	373	254
tC, single (s)	4.1			4.3			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			88	100	100	100	100	99
cM capacity (veh/h)	1322			1351			592	575	979	600	558	789
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	109	259	74	7								
Volume Left	1	4	70	0								
Volume Right	45	0	3	4								
cSH	1322	1351	603	694								
Volume to Capacity	0.00	0.00	0.12	0.01								
Queue Length 95th (ft)	0	0	10	1								
Control Delay (s)	0.1	0.2	11.8	10.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.8	10.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization		31.9%		ICU Level of Service					A			
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	65	0	0	189	48	1	0	0	61	1	57
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	10	84	0	0	245	62	1	0	0	79	1	74
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	308			84			456	413	84	382	382	277
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	308			84			456	413	84	382	382	277
tC, single (s)	4.3			4.1			8.1	6.5	6.2	7.2	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			4.4	4.0	3.3	3.6	4.0	3.4
p0 queue free %	99			100			100	100	100	86	100	90
cM capacity (veh/h)	1133			1525			341	528	980	558	549	741
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	95	308	1	155								
Volume Left	10	0	1	79								
Volume Right	0	62	0	74								
cSH	1133	1525	341	633								
Volume to Capacity	0.01	0.00	0.00	0.24								
Queue Length 95th (ft)	1	0	0	24								
Control Delay (s)	1.0	0.0	15.6	12.5								
Lane LOS	A		C	B								
Approach Delay (s)	1.0	0.0	15.6	12.5								
Approach LOS			C	B								
Intersection Summary												
Average Delay			3.7									
Intersection Capacity Utilization		25.7%		ICU Level of Service					A			
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↓		↑	↑↓			↔		↑	↑	↑
Volume (vph)	358	224	0	0	258	38	0	0	1	22	0	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0			4.0		4.0	4.0
Lane Util. Factor	1.00	0.95						1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00				1.00			0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00				1.00			1.00		1.00	1.00
Fr <sub>t</sub>	1.00	1.00				0.98			0.86		1.00	0.85
Flt Protected	0.95	1.00				1.00			1.00		0.95	1.00
Satd. Flow (prot)	1671	3505				3438			1623		1804	1491
Flt Permitted	0.95	1.00				1.00			1.00		1.00	1.00
Satd. Flow (perm)	1671	3505				3438			1623		1899	1491
Peak-hour factor, PHF	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Adj. Flow (vph)	597	373	0	0	430	63	0	0	2	37	0	480
RTOR Reduction (vph)	0	0	0	0	13	0	0	2	0	0	0	92
Lane Group Flow (vph)	597	373	0	0	480	0	0	0	0	0	37	388
Confl. Peds. (#/hr)						4			1	1		4
Heavy Vehicles (%)	8%	3%	0%	0%	3%	3%	0%	0%	0%	0%	0%	8%
Turn Type	Prot			Prot			Perm			Perm		pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases							2			6		6
Actuated Green, G (s)	17.8	33.3			11.5			2.6			2.6	20.4
Effective Green, g (s)	17.8	33.3			11.5			2.6			2.6	20.4
Actuated g/C Ratio	0.41	0.76			0.26			0.06			0.06	0.46
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	678	2659			901			96			112	829
v/s Ratio Prot	c0.36	0.11			c0.14			0.00				c0.19
v/s Ratio Perm											0.02	0.07
v/c Ratio	0.88	0.14			0.53			0.00			0.33	0.47
Uniform Delay, d1	12.1	1.4			13.9			19.4			19.8	8.0
Progression Factor	1.00	1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2	12.8	0.0			0.6			0.0			1.7	0.4
Delay (s)	24.8	1.5			14.5			19.4			21.5	8.5
Level of Service	C	A			B			B			C	A
Approach Delay (s)		15.8			14.5			19.4			9.4	
Approach LOS		B			B			B			A	

#### Intersection Summary

HCM Average Control Delay	13.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	43.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘	↑ ↗	↑ ↗	↑ ↗ ↘		↑ ↗	↑ ↗		↑ ↗	↑ ↗	
Volume (vph)	4	157	143	98	221	4	106	8	81	13	31	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00		1.00	0.86		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1881	1532	1805	3529		1735	1612		1805	1772	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.71	1.00		0.67	1.00	
Satd. Flow (perm)	1805	1881	1532	1805	3529		1291	1612		1281	1772	
Peak-hour factor, PHF	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Adj. Flow (vph)	6	228	207	142	320	6	154	12	117	19	45	32
RTOR Reduction (vph)	0	0	133	0	1	0	0	90	0	0	24	0
Lane Group Flow (vph)	6	228	74	142	325	0	154	39	0	19	53	0
Confl. Peds. (#/hr)			4	4			1					1
Confl. Bikes (#/hr)							1					
Heavy Vehicles (%)	0%	1%	3%	0%	2%	0%	4%	0%	2%	0%	0%	0%
Turn Type	Prot		Perm	Prot			Perm			Perm		
Protected Phases	7	4		3	8		2					6
Permitted Phases			4				2					6
Actuated Green, G (s)	0.9	17.1	17.1	7.7	23.9		11.3	11.3		11.3	11.3	
Effective Green, g (s)	0.9	17.1	17.1	7.7	23.9		11.3	11.3		11.3	11.3	
Actuated g/C Ratio	0.02	0.36	0.36	0.16	0.50		0.23	0.23		0.23	0.23	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	34	669	545	289	1753		303	379		301	416	
v/s Ratio Prot	0.00	c0.12		c0.08	0.09			0.02			0.03	
v/s Ratio Perm			0.05				c0.12			0.01		
v/c Ratio	0.18	0.34	0.14	0.49	0.19		0.51	0.10		0.06	0.13	
Uniform Delay, d1	23.2	11.4	10.5	18.4	6.7		16.0	14.4		14.3	14.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.5	0.3	0.1	1.3	0.1		1.3	0.1		0.1	0.1	
Delay (s)	25.7	11.7	10.6	19.7	6.8		17.3	14.6		14.4	14.6	
Level of Service	C	B	B	B	A		B	B		B	B	
Approach Delay (s)		11.4			10.7			16.1			14.6	
Approach LOS		B			B			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay		12.4			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.43										
Actuated Cycle Length (s)		48.1			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		38.2%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	52	53	90	198	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	3	58	60	101	222	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				358		
pX, platoon unblocked						
vC, conflicting volume	443	223	224			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	443	223	224			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	93	96			
cM capacity (veh/h)	550	822	1357			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	62	60	101	224		
Volume Left	3	60	0	0		
Volume Right	58	0	0	1		
cSH	800	1357	1700	1700		
Volume to Capacity	0.08	0.04	0.06	0.13		
Queue Length 95th (ft)	6	3	0	0		
Control Delay (s)	9.9	7.8	0.0	0.0		
Lane LOS	A	A				
Approach Delay (s)	9.9	2.9		0.0		
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			2.4			
Intersection Capacity Utilization		27.2%		ICU Level of Service		A
Analysis Period (min)			15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑	↑	↑	↑	↑
Volume (vph)	53	38	21	172	118	65	44	271	86	29	199	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1671		1787	1749		1805	1827	1546	1751	1845	1509
Flt Permitted	0.60	1.00		0.46	1.00		0.47	1.00	1.00	0.40	1.00	1.00
Satd. Flow (perm)	1091	1671		865	1749		893	1827	1546	746	1845	1509
Peak-hour factor, PHF	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Adj. Flow (vph)	76	54	30	246	169	93	63	387	123	41	284	39
RTOR Reduction (vph)	0	26	0	0	29	0	0	0	78	0	0	26
Lane Group Flow (vph)	76	58	0	246	233	0	63	387	46	41	284	13
Confl. Peds. (#/hr)				1	1				3	3		
Heavy Vehicles (%)	4%	0%	19%	1%	0%	8%	0%	4%	2%	3%	3%	7%
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	10.4	7.6		20.4	13.6		21.5	18.7	18.7	19.3	17.6	17.6
Effective Green, g (s)	10.4	7.6		20.4	13.6		21.5	18.7	18.7	19.3	17.6	17.6
Actuated g/C Ratio	0.20	0.14		0.39	0.26		0.41	0.35	0.35	0.37	0.33	0.33
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	249	241		488	451		412	647	548	305	615	503
v/s Ratio Prot	0.02	0.03		c0.08	c0.13		c0.01	c0.21		0.00	0.15	
v/s Ratio Perm	0.04			0.11			0.05		0.03	0.04		0.01
v/c Ratio	0.31	0.24		0.50	0.52		0.15	0.60	0.08	0.13	0.46	0.03
Uniform Delay, d1	17.8	20.0		11.7	16.8		9.7	14.0	11.3	11.1	13.9	11.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.5		0.8	1.0		0.2	1.5	0.1	0.2	0.6	0.0
Delay (s)	18.5	20.6		12.5	17.8		9.9	15.5	11.4	11.3	14.4	11.9
Level of Service	B	C		B	B		A	B	B	B	B	B
Approach Delay (s)		19.6			15.2			14.0			13.8	
Approach LOS		B			B			B			B	

**Intersection Summary**

HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	52.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗
Volume (vph)	276	23	120	360	46	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1597	1482	1743	1509	1504	1900
Flt Permitted	0.95	1.00	1.00	1.00	0.48	1.00
Satd. Flow (perm)	1597	1482	1743	1509	756	1900
Peak-hour factor, PHF	0.72	0.72	0.72	0.72	0.72	0.72
Adj. Flow (vph)	383	32	167	500	64	283
RTOR Reduction (vph)	0	15	0	363	0	0
Lane Group Flow (vph)	383	17	167	137	64	283
Heavy Vehicles (%)	13%	9%	9%	7%	20%	0%
Turn Type	Perm		Perm	pm+pt		
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	18.4	18.4	13.7	13.7	22.7	22.7
Effective Green, g (s)	18.4	18.4	13.7	13.7	22.7	22.7
Actuated g/C Ratio	0.37	0.37	0.27	0.27	0.45	0.45
Clearance Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	587	544	477	413	402	861
v/s Ratio Prot	c0.24		0.10		0.01	c0.15
v/s Ratio Perm		0.01		0.09	0.06	
v/c Ratio	0.65	0.03	0.35	0.33	0.16	0.33
Uniform Delay, d1	13.2	10.1	14.6	14.5	8.1	8.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	0.0	0.4	0.5	0.2	0.2
Delay (s)	15.8	10.2	15.1	15.0	8.3	9.0
Level of Service	B	B	B	B	A	A
Approach Delay (s)	15.4		15.0			8.9
Approach LOS	B		B			A
Intersection Summary						
HCM Average Control Delay		13.6	HCM Level of Service		B	
HCM Volume to Capacity ratio		0.47				
Actuated Cycle Length (s)		50.1	Sum of lost time (s)		9.0	
Intersection Capacity Utilization		34.0%	ICU Level of Service		A	
Analysis Period (min)		15				
c Critical Lane Group						



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	1	1	1	1	1	1
Volume (veh/h)	159	144	7	98	149	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	175	158	8	108	164	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		333		377	254	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		333		377	254	
tC, single (s)		4.1		6.4	6.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	3.3	
p0 queue free %		99		74	99	
cM capacity (veh/h)		1238		621	790	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	333	115	175			
Volume Left	0	8	164			
Volume Right	158	0	11			
cSH	1700	1238	629			
Volume to Capacity	0.20	0.01	0.28			
Queue Length 95th (ft)	0	0	28			
Control Delay (s)	0.0	0.6	12.9			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.6	12.9			
Approach LOS			B			
Intersection Summary						
Average Delay		3.7				
Intersection Capacity Utilization		32.7%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Volume (vph)	192	108	584	220	140	344
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8		5.4		5.7	5.4
Lane Util. Factor	1.00		1.00		1.00	1.00
Frpb, ped/bikes	0.99		0.99		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Fr <sub>t</sub>	0.95		0.96		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1714		1785		1752	1881
Flt Permitted	0.97		1.00		0.15	1.00
Satd. Flow (perm)	1714		1785		271	1881
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	192	108	584	220	140	344
RTOR Reduction (vph)	15	0	7	0	0	0
Lane Group Flow (vph)	285	0	797	0	140	344
Confl. Peds. (#/hr)			2		8	8
Heavy Vehicles (%)	2%	0%	1%	2%	3%	1%
Turn Type					pm+pt	
Protected Phases	6		4		3	8
Permitted Phases					8	
Actuated Green, G (s)	20.0		55.5		69.0	69.0
Effective Green, g (s)	20.0		55.5		69.0	69.0
Actuated g/C Ratio	0.20		0.55		0.69	0.69
Clearance Time (s)	5.8		5.4		5.7	5.4
Vehicle Extension (s)	1.0		1.0		1.0	1.0
Lane Grp Cap (vph)	342		989		302	1295
v/s Ratio Prot	c0.17		c0.45		c0.04	0.18
v/s Ratio Perm					0.28	
v/c Ratio	0.83		0.81		0.46	0.27
Uniform Delay, d1	38.5		18.0		13.6	5.9
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	15.1		4.6		0.4	0.0
Delay (s)	53.6		22.6		14.0	6.0
Level of Service	D		C		B	A
Approach Delay (s)	53.6		22.6			8.3
Approach LOS	D		C			A
<b>Intersection Summary</b>						
HCM Average Control Delay		24.1		HCM Level of Service		C
HCM Volume to Capacity ratio		0.78				
Actuated Cycle Length (s)		100.2		Sum of lost time (s)		16.9
Intersection Capacity Utilization		83.5%		ICU Level of Service		E
Analysis Period (min)		15				
c Critical Lane Group						



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	327	24	41	207	2	45	5	60	1	4	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Fr <sub>t</sub>		0.99			1.00			0.93			0.98	
Flt Protected		1.00			0.99			0.98			0.99	
Satd. Flow (prot)		1848			1861			1686			1850	
Flt Permitted		1.00			0.91			0.86			0.95	
Satd. Flow (perm)		1841			1702			1487			1763	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	6	372	27	47	235	2	51	6	68	1	5	1
RTOR Reduction (vph)	0	3	0	0	0	0	0	56	0	0	1	0
Lane Group Flow (vph)	0	402	0	0	284	0	0	69	0	0	6	0
Confl. Peds. (#/hr)	2				2				3	3		
Confl. Bikes (#/hr)					1							
Heavy Vehicles (%)	0%	2%	0%	2%	1%	0%	0%	0%	2%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.6			19.6			6.0			6.0		
Effective Green, g (s)	19.6			19.6			6.0			6.0		
Actuated g/C Ratio	0.58			0.58			0.18			0.18		
Clearance Time (s)	4.0			4.0			4.0			4.0		
Vehicle Extension (s)	3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)	1074			993			266			315		
v/s Ratio Prot												
v/s Ratio Perm	c0.22			0.17			c0.05			0.00		
v/c Ratio	0.37			0.29			0.26			0.02		
Uniform Delay, d1	3.7			3.5			11.9			11.4		
Progression Factor	1.00			1.00			1.00			1.00		
Incremental Delay, d2	0.2			0.2			0.5			0.0		
Delay (s)	4.0			3.7			12.4			11.4		
Level of Service	A			A			B			B		
Approach Delay (s)	4.0			3.7			12.4			11.4		
Approach LOS	A			A			B			B		
<b>Intersection Summary</b>												
HCM Average Control Delay		5.2		HCM Level of Service				A				
HCM Volume to Capacity ratio		0.35										
Actuated Cycle Length (s)		33.6		Sum of lost time (s)				8.0				
Intersection Capacity Utilization		56.9%		ICU Level of Service				B				
Analysis Period (min)		15										
c Critical Lane Group												



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	93	274	144	52	101	57
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	107	315	166	60	116	66
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	225			724	195	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	225			724	195	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	92			68	92	
cM capacity (veh/h)	1355			362	851	
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	422	225	116	66		
Volume Left	107	0	116	0		
Volume Right	0	60	0	66		
cSH	1355	1700	362	851		
Volume to Capacity	0.08	0.13	0.32	0.08		
Queue Length 95th (ft)	6	0	34	6		
Control Delay (s)	2.6	0.0	19.6	9.6		
Lane LOS	A		C	A		
Approach Delay (s)	2.6	0.0	16.0			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			4.8			
Intersection Capacity Utilization		45.9%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	300	54	2	160	0	34	0	3	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	1	345	62	2	184	0	39	0	3	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	184			407			567	567	376	570	598	184
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	184			407			567	567	376	570	598	184
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			91	100	99	100	100	100
cM capacity (veh/h)	1403			1163			437	435	675	432	417	864
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	408	186	43	0								
Volume Left	1	2	39	0								
Volume Right	62	0	3	0								
cSH	1403	1163	449	1700								
Volume to Capacity	0.00	0.00	0.09	0.00								
Queue Length 95th (ft)	0	0	8	0								
Control Delay (s)	0.0	0.1	13.8	0.0								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.0	0.1	13.8	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization		29.7%		ICU Level of Service					A			
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	78	207	1	2	135	70	1	0	0	89	0	38
Sign Control		Free				Free			Stop			Stop
Grade		0%				0%			0%			0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	83	220	1	2	144	74	1	0	0	95	0	40
Pedestrians						1						
Lane Width (ft)						12.0						
Walking Speed (ft/s)						4.0						
Percent Blockage						0						
Right turn flare (veh)												
Median type		None				None						
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	218			221			612	609	222	573	572	181
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	218			221			612	609	222	573	572	181
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.4
p0 queue free %	94			100			100	100	100	77	100	95
cM capacity (veh/h)	1334			1360			370	386	822	408	405	847
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	304	220	1	135								
Volume Left	83	2	1	95								
Volume Right	1	74	0	40								
cSH	1334	1360	370	483								
Volume to Capacity	0.06	0.00	0.00	0.28								
Queue Length 95th (ft)	5	0	0	28								
Control Delay (s)	2.6	0.1	14.8	15.3								
Lane LOS	A	A	B	C								
Approach Delay (s)	2.6	0.1	14.8	15.3								
Approach LOS			B	C								
<b>Intersection Summary</b>												
Average Delay			4.4									
Intersection Capacity Utilization		43.3%		ICU Level of Service					A			
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↓		↑	↑↓			↔			↑	↑
Volume (vph)	69	555	0	1	414	38	0	0	0	39	0	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0						4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95						1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00						1.00	1.00
Fr <sub>t</sub>	1.00	1.00		1.00	0.99						1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00						0.95	1.00
Satd. Flow (prot)	1805	3610		1804	3486						1752	1615
Flt Permitted	0.95	1.00		0.95	1.00						1.00	1.00
Satd. Flow (perm)	1805	3610		1804	3486						1845	1615
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	80	645	0	1	481	44	0	0	0	45	0	50
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	0	40
Lane Group Flow (vph)	80	645	0	1	520	0	0	0	0	0	45	10
Confl. Peds. (#/hr)			3	3								
Confl. Bikes (#/hr)			1			1				1		
Heavy Vehicles (%)	0%	0%	0%	0%	2%	3%	0%	0%	0%	3%	0%	0%
Turn Type	Prot			Prot			Perm			Perm		pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases							2			6		6
Actuated Green, G (s)	6.0	26.0		0.9	20.9						2.7	8.7
Effective Green, g (s)	6.0	26.0		0.9	20.9						2.7	8.7
Actuated g/C Ratio	0.14	0.62		0.02	0.50						0.06	0.21
Clearance Time (s)	4.0	4.0		4.0	4.0						4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)	260	2256		39	1751						120	493
v/s Ratio Prot	c0.04	c0.18		0.00	0.15							0.00
v/s Ratio Perm											c0.02	0.00
v/c Ratio	0.31	0.29		0.03	0.30						0.38	0.02
Uniform Delay, d1	15.9	3.6		19.9	6.1						18.6	13.1
Progression Factor	1.00	1.00		1.00	1.00						1.00	1.00
Incremental Delay, d2	0.7	0.1		0.3	0.1						2.0	0.0
Delay (s)	16.6	3.6		20.2	6.1						20.6	13.1
Level of Service	B	A		C	A						C	B
Approach Delay (s)		5.1			6.2			0.0			16.6	
Approach LOS		A			A			A			B	

#### Intersection Summary

HCM Average Control Delay	6.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	41.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘	↑ ↗	↑ ↘	↑ ↗	↑ ↘	↑ ↗	↑ ↘	↑ ↗	↑ ↘	↑ ↗	↑ ↘
Volume (vph)	24	367	213	30	239	5	170	22	61	5	13	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00		1.00	0.89		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1900	1599	1805	3563		1786	1691		1805	1741	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.74	1.00		0.70	1.00	
Satd. Flow (perm)	1805	1900	1599	1805	3563		1390	1691		1332	1741	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	25	378	220	31	246	5	175	23	63	5	13	14
RTOR Reduction (vph)	0	0	125	0	2	0	0	47	0	0	10	0
Lane Group Flow (vph)	25	378	95	31	249	0	175	39	0	5	17	0
Confl. Peds. (#/hr)	2					2	2				2	
Heavy Vehicles (%)	0%	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot		Perm	Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	1.1	19.9	19.9	2.3	21.1		11.9	11.9		11.9	11.9	
Effective Green, g (s)	1.1	19.9	19.9	2.3	21.1		11.9	11.9		11.9	11.9	
Actuated g/C Ratio	0.02	0.43	0.43	0.05	0.46		0.26	0.26		0.26	0.26	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	43	820	690	90	1631		359	437		344	449	
v/s Ratio Prot	0.01	c0.20		c0.02	0.07			0.02			0.01	
v/s Ratio Perm			0.06				c0.13			0.00		
v/c Ratio	0.58	0.46	0.14	0.34	0.15		0.49	0.09		0.01	0.04	
Uniform Delay, d1	22.3	9.3	7.9	21.2	7.3		14.5	13.0		12.7	12.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.4	0.4	0.1	2.3	0.0		1.0	0.1		0.0	0.0	
Delay (s)	40.7	9.7	8.0	23.5	7.3		15.6	13.1		12.8	12.8	
Level of Service	D	A	A	C	A		B	B		B	B	
Approach Delay (s)		10.4			9.1			14.7			12.8	
Approach LOS		B			A			B			B	

#### Intersection Summary

HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	46.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	2	52	53	249	147	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	2	60	61	286	169	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				358		
pX, platoon unblocked	0.92					
vC, conflicting volume	579	171	174			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	499	171	174			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	93	96			
cM capacity (veh/h)	470	878	1403			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	62	61	286	174		
Volume Left	2	61	0	0		
Volume Right	60	0	0	5		
cSH	850	1403	1700	1700		
Volume to Capacity	0.07	0.04	0.17	0.10		
Queue Length 95th (ft)	6	3	0	0		
Control Delay (s)	9.6	7.7	0.0	0.0		
Lane LOS	A	A				
Approach Delay (s)	9.6	1.3		0.0		
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			1.8			
Intersection Capacity Utilization		24.6%		ICU Level of Service		A
Analysis Period (min)			15			

## PM Existing Conditions

110: NW 38th Ave &amp; NW Parker St

11/6/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑	↑	↑	↑	↑
Volume (vph)	38	172	68	99	122	45	61	234	153	76	316	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.96	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1806		1735	1790		1805	1881	1557	1798	1881	1579
Flt Permitted	0.63	1.00		0.41	1.00		0.39	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	1204	1806		743	1790		741	1881	1557	843	1881	1579
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	45	202	80	116	144	53	72	275	180	89	372	55
RTOR Reduction (vph)	0	21	0	0	18	0	0	0	126	0	0	37
Lane Group Flow (vph)	45	261	0	116	179	0	72	275	54	89	372	18
Confl. Peds. (#/hr)				1	1				12	12		
Confl. Bikes (#/hr)				3			1		1			2
Heavy Vehicles (%)	0%	0%	0%	4%	1%	2%	0%	1%	0%	0%	1%	0%
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	18.0	15.0		20.6	16.3		19.8	16.8	16.8	22.4	18.1	18.1
Effective Green, g (s)	18.0	15.0		20.6	16.3		19.8	16.8	16.8	22.4	18.1	18.1
Actuated g/C Ratio	0.32	0.27		0.37	0.29		0.35	0.30	0.30	0.40	0.32	0.32
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	416	480		347	517		317	560	464	408	604	507
v/s Ratio Prot	0.01	c0.14		c0.03	0.10		0.01	0.15		c0.02	c0.20	
v/s Ratio Perm	0.03			0.10			0.07		0.03	0.07		0.01
v/c Ratio	0.11	0.54		0.33	0.35		0.23	0.49	0.12	0.22	0.62	0.03
Uniform Delay, d1	13.4	17.8		12.4	15.8		12.6	16.3	14.4	11.0	16.2	13.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	1.3		0.6	0.4		0.4	0.7	0.1	0.3	1.9	0.0
Delay (s)	13.5	19.0		13.0	16.2		12.9	17.0	14.5	11.2	18.1	13.2
Level of Service	B	B		B	B		B	B	B	B	B	B
Approach Delay (s)		18.3			15.0			15.6			16.4	
Approach LOS		B			B			B			B	

## Intersection Summary

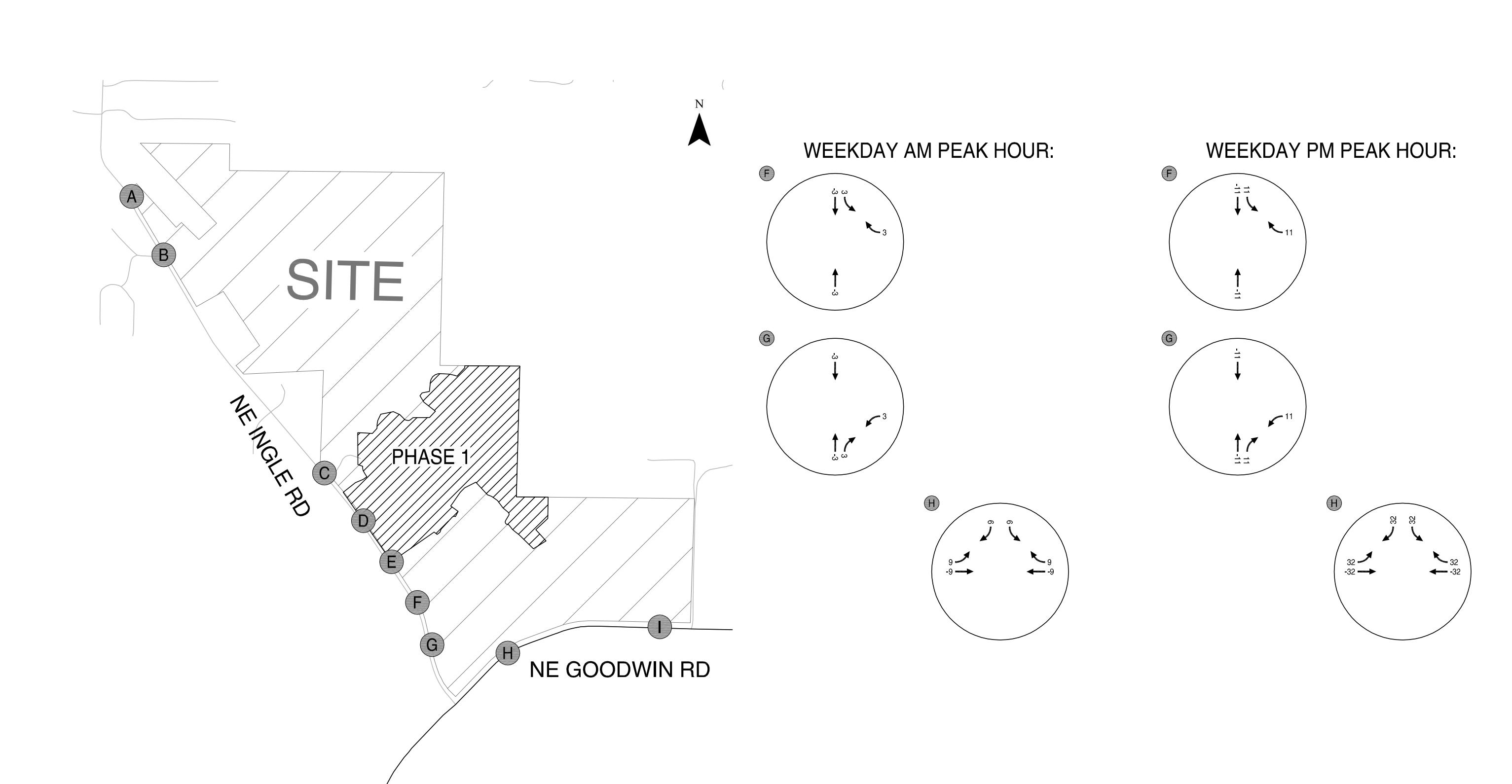
HCM Average Control Delay	16.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	56.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (vph)	195	34	268	193	32	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	1615	1845	1569	1805	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.38	1.00
Satd. Flow (perm)	1787	1615	1845	1569	716	1881
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	241	42	331	238	40	206
RTOR Reduction (vph)	0	30	0	157	0	0
Lane Group Flow (vph)	241	12	331	81	40	206
Confl. Bikes (#/hr)				8		
Heavy Vehicles (%)	1%	0%	3%	0%	0%	1%
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	12.8	12.8	14.7	14.7	21.6	21.6
Effective Green, g (s)	12.8	12.8	14.7	14.7	21.6	21.6
Actuated g/C Ratio	0.29	0.29	0.34	0.34	0.50	0.50
Clearance Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	527	476	625	531	404	936
v/s Ratio Prot	c0.13		c0.18		0.00	c0.11
v/s Ratio Perm		0.01		0.05	0.04	
v/c Ratio	0.46	0.03	0.53	0.15	0.10	0.22
Uniform Delay, d1	12.5	10.9	11.6	10.0	6.1	6.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.0	0.8	0.1	0.1	0.1
Delay (s)	13.1	10.9	12.4	10.1	6.2	6.3
Level of Service	B	B	B	B	A	A
Approach Delay (s)	12.8		11.4		6.3	
Approach LOS	B		B		A	
Intersection Summary						
HCM Average Control Delay		10.6		HCM Level of Service		B
HCM Volume to Capacity ratio		0.50				
Actuated Cycle Length (s)		43.4		Sum of lost time (s)		14.0
Intersection Capacity Utilization		39.9%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

## Appendix E Pass-by Trip Assignment



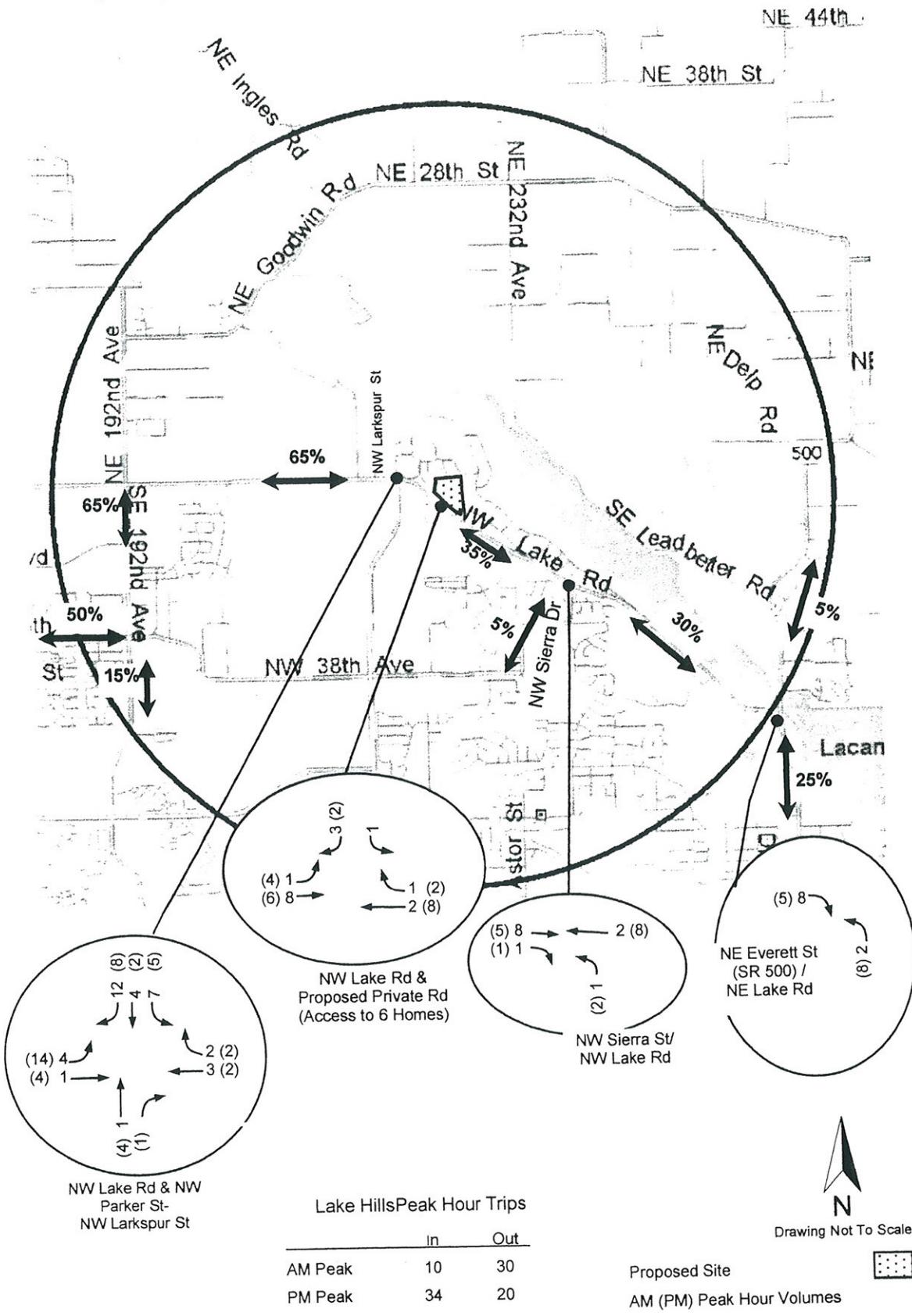
Note: Retail Component (source of pass-by trips)  
uses driveways F, G, and H

Pass-by Trips for Full Build-Out Scenario  
Camas, Washington

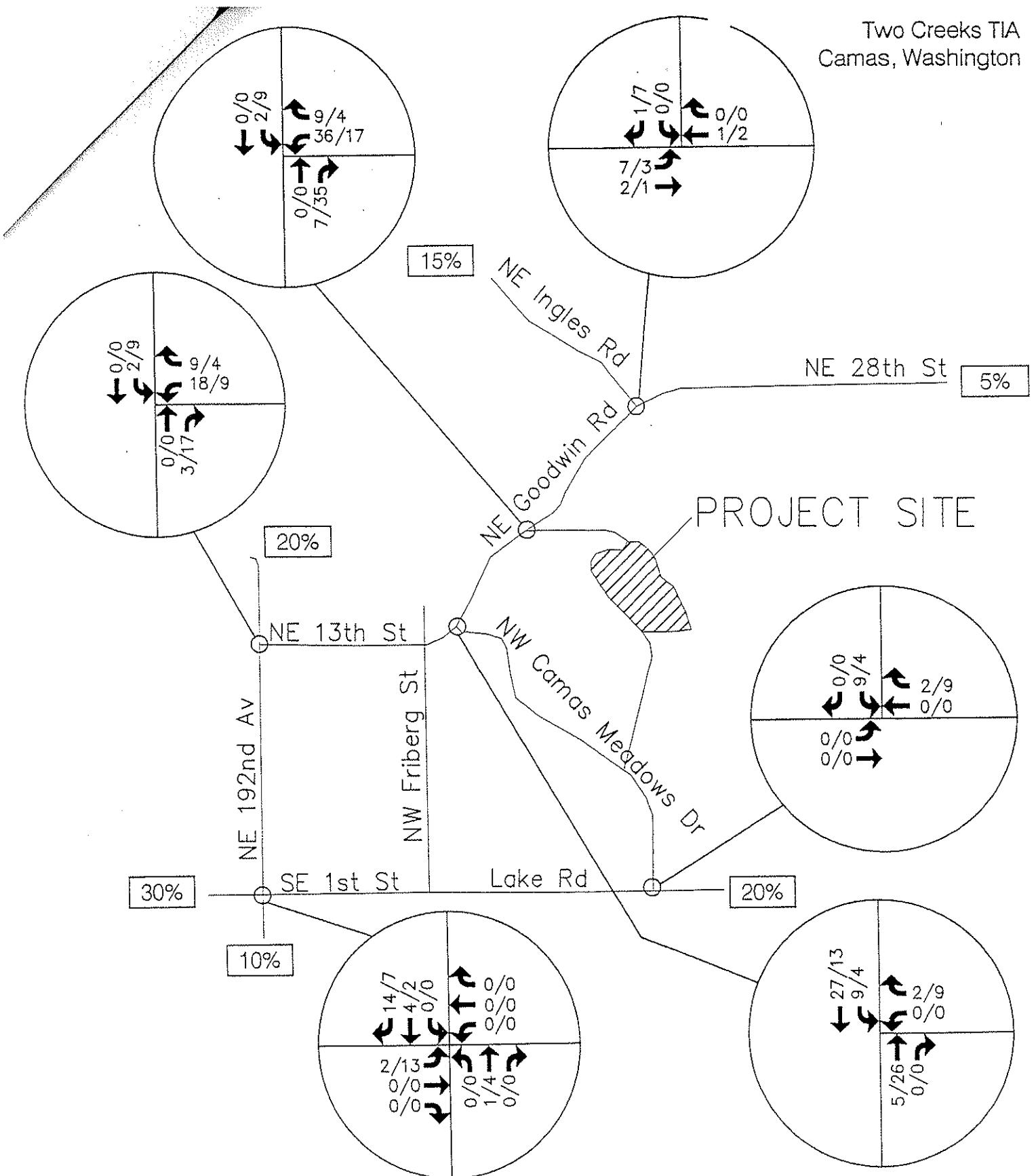
Figure  
E1

## Appendix F In-Process Developments

Figure 8: Weekday Peak Hour Trip Assignment Of New Peak Hour Vehicle Trips Generated by Proposed ~~Lake Hills Residential~~ Development (2-mile Radius)



Two Creeks TIA  
Camas, Washington



LEGEND

5/10

A.M. and P.M. Peak Hour  
Traffic Volumes

40%

A.M. and P.M. Peak Hour Trip Distribution

NOT TO SCALE

FIGURE 6  
Trip Distribution and Assignment

Alternative 2  
(123 UNITS)

Alt. #1 was 112 UNITS

304031.0Figures.dwg

**Figure 3: Recent Weekday Peak Hour Traffic Volumes In  
The Vicinity Of The Summit at Columbia Vista**

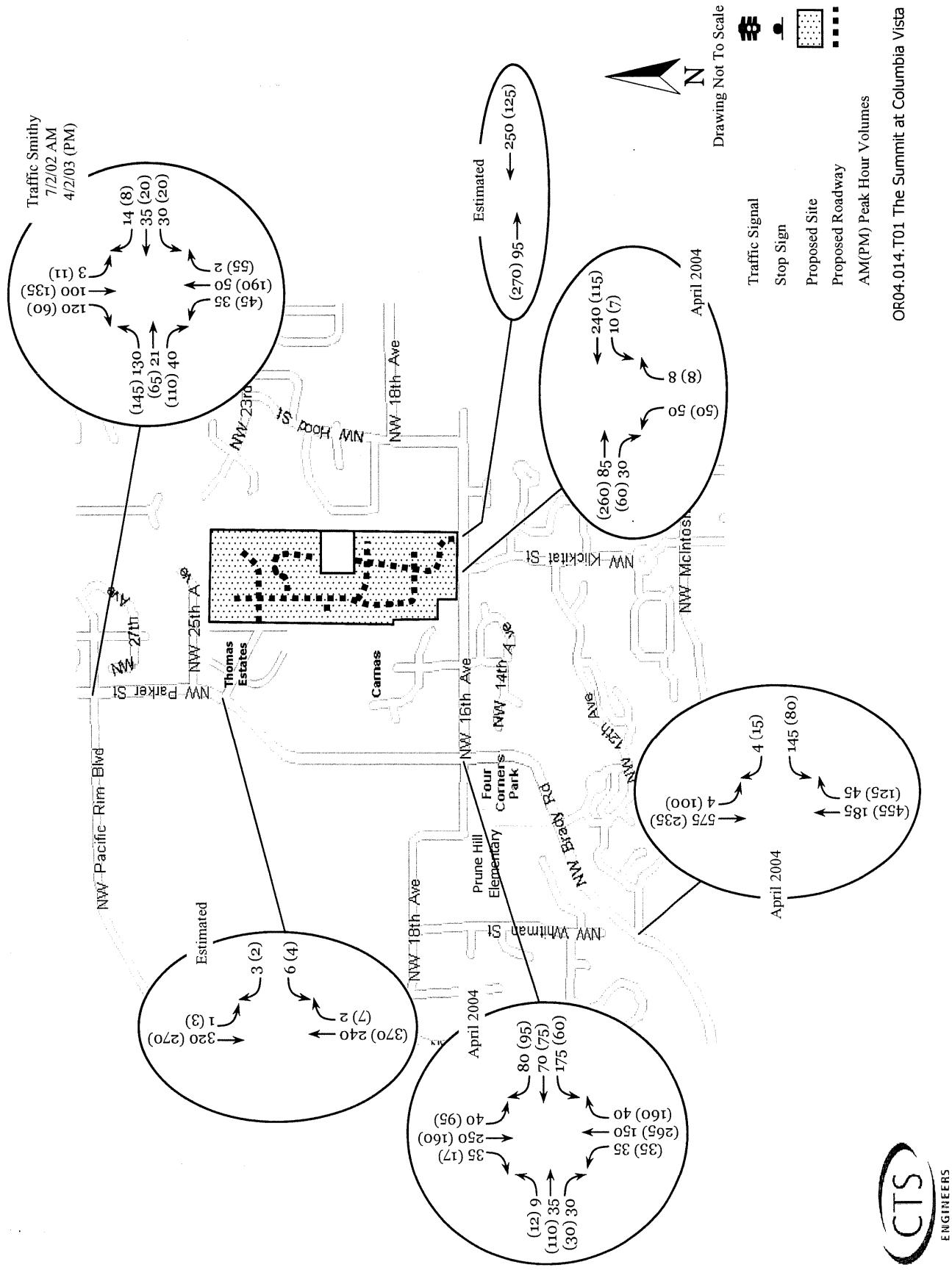
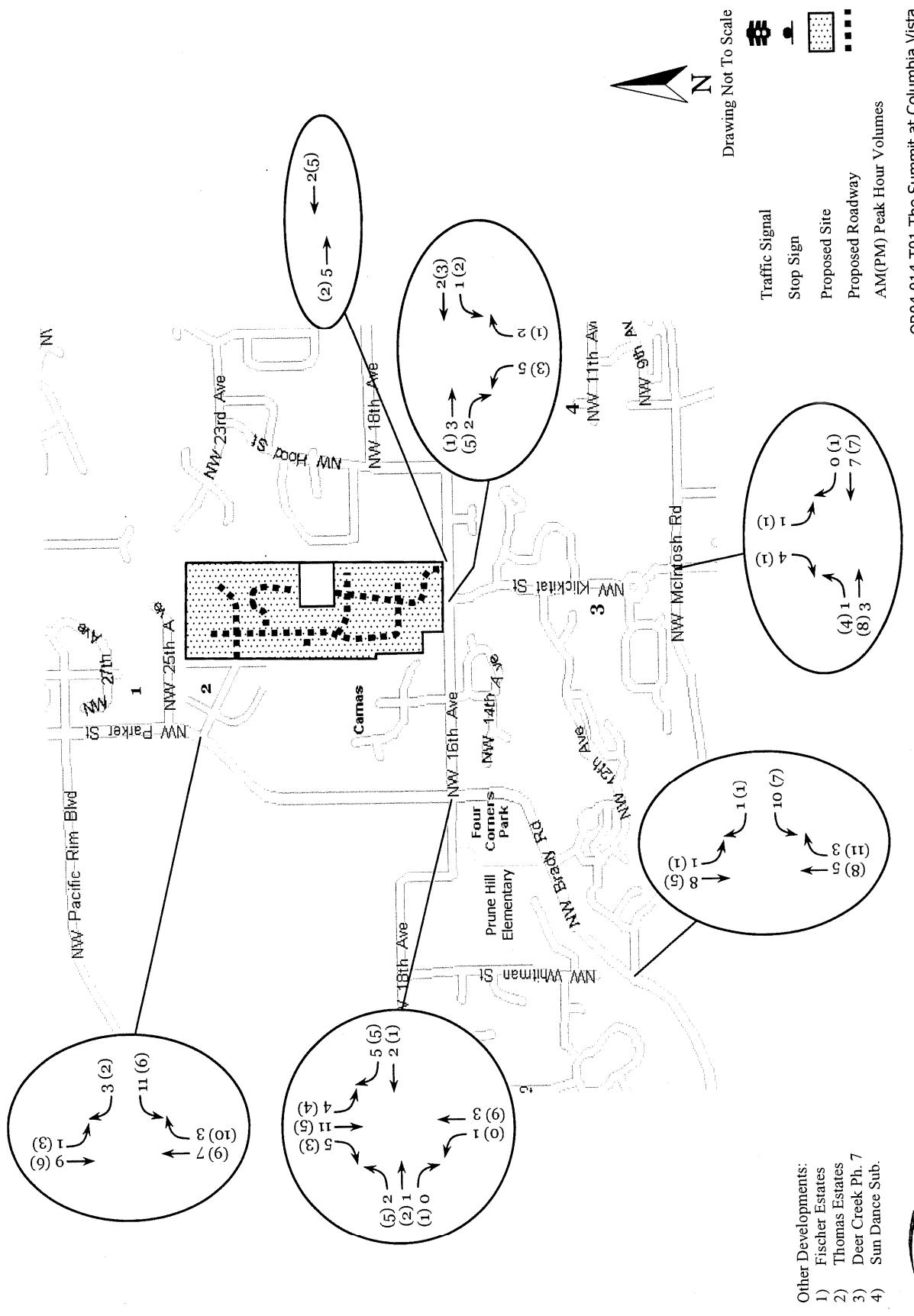


Figure 6: Weekday Peak Hour In-Process Traffic Volumes  
In The Vicinity Of The Summit at Columbia Vista



Other Developments:  
 1) Fischer Estates  
 2) Thomas Estates  
 3) Deer Creek Ph. 7  
 4) Sun Dance Sub.

**CTS**  
ENGINEERS

**Figure 9: Weekday Peak Hour Traffic Volumes Generated The Summit at Columbia Vista  
(119 Detached Single Family Homes)**

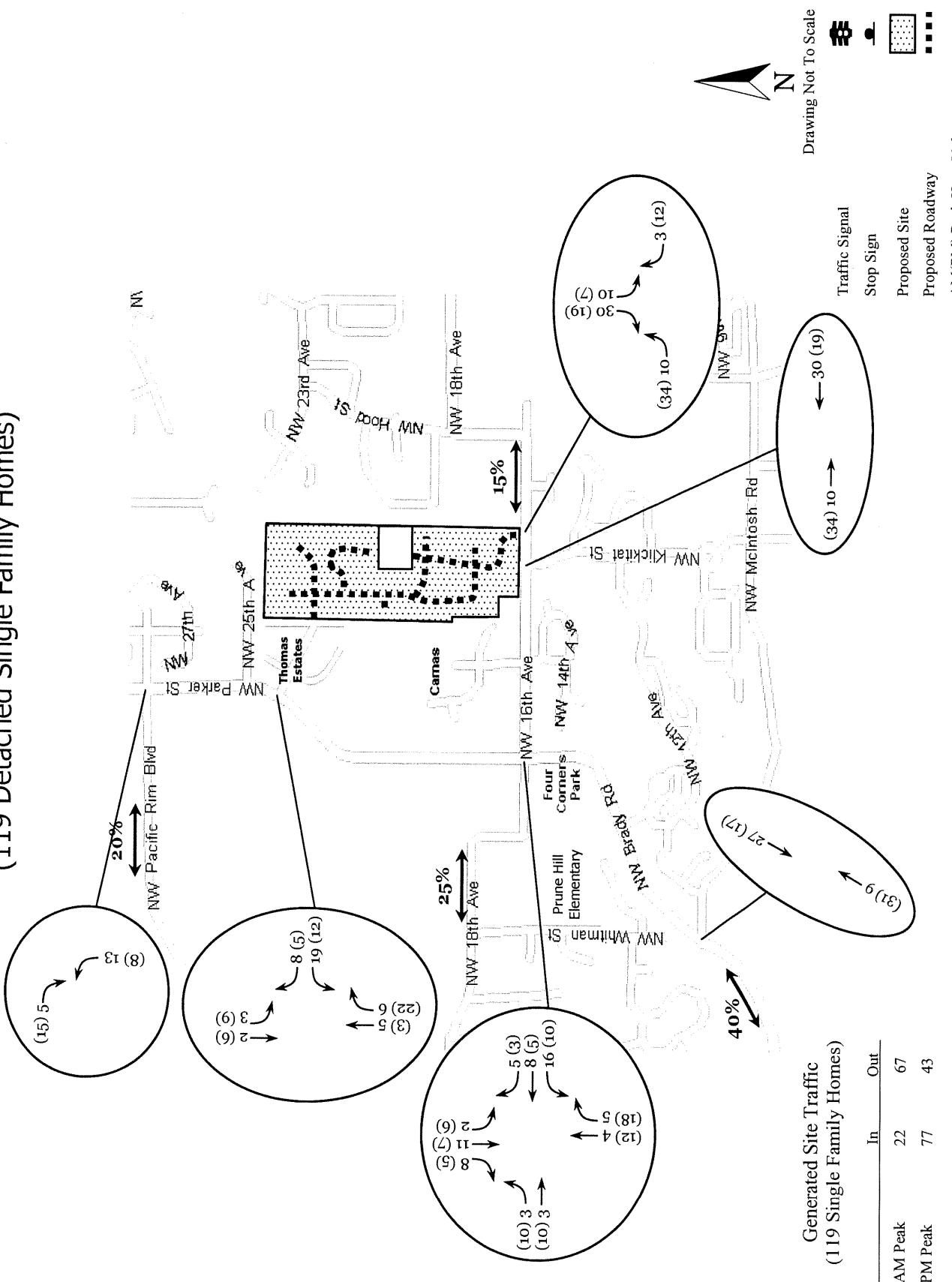


Figure 8: Weekday Peak Hour Traffic Volumes Generated By Parker Village (Residential Development)

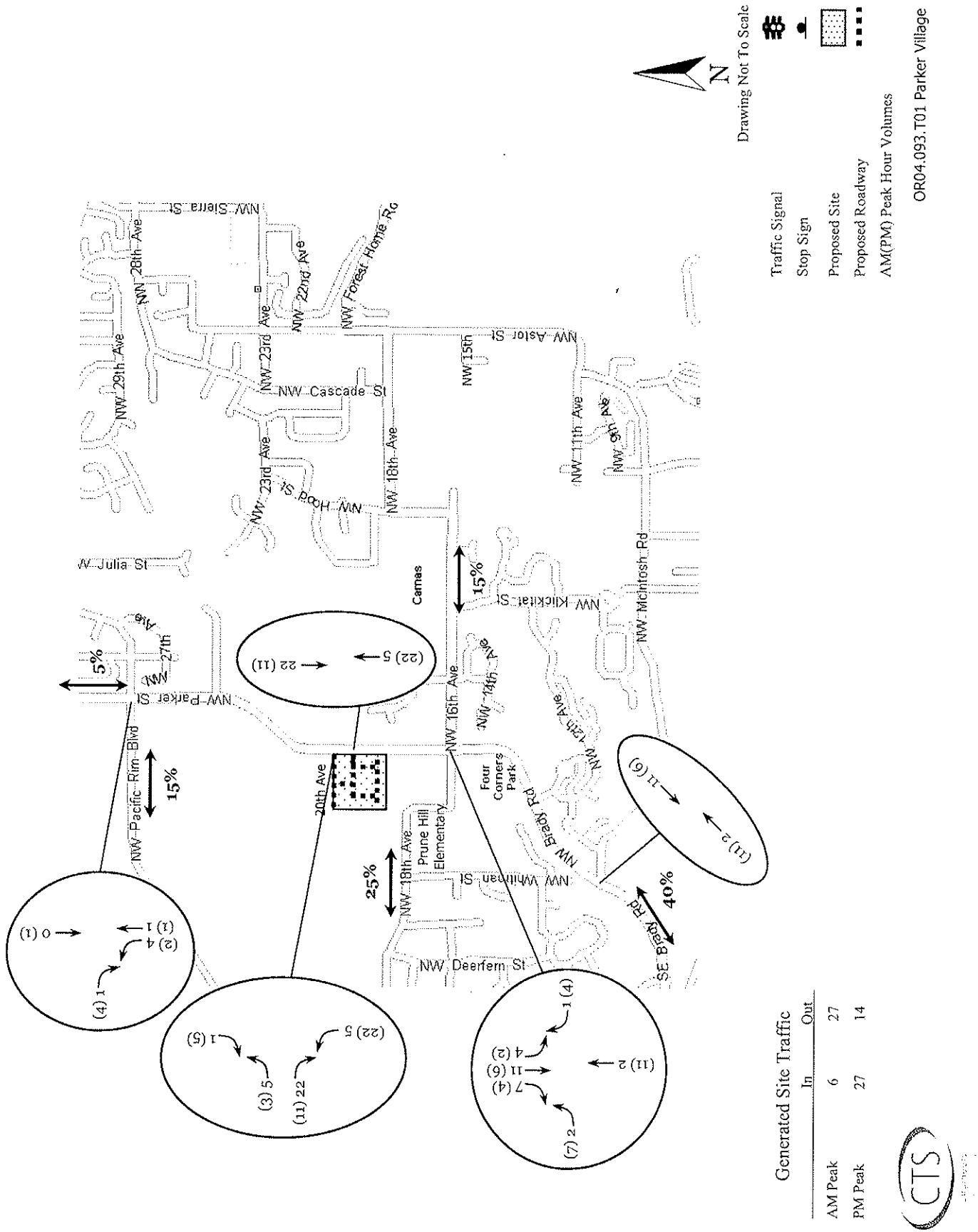
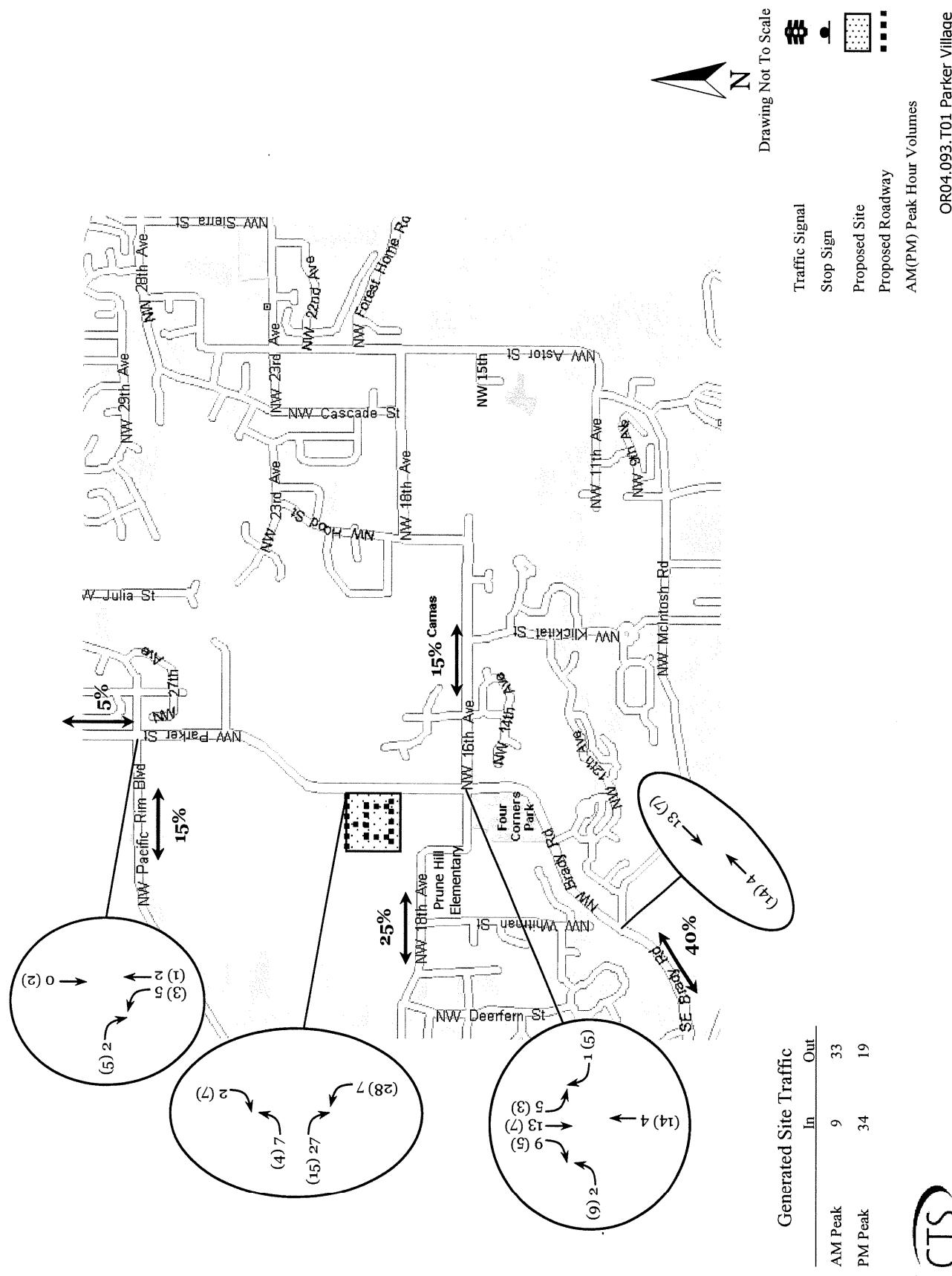


Figure 9: Weekday Peak Hour Traffic Volumes Generated By Parker Village



**Table 1 Projected Trip Generation for Residential**

ITE Land Use	Units (#)	Weekday						
		ADT	AM Peak Hour			PM Peak Hour		
			Total	Enter	Exit	Total	Enter	
Single-Family (#210) Generation Rate <sup>1</sup> Site Trips	295	9.57 2823	0.75 221	25% 55	75% 166	1.01 298	63% 188	37% 110
Apartment (#220) Generation Rate <sup>2</sup> Site Trips	128	3.12 920	0.22 66	20% 13	80% 53	0.30 88	65% 57	35% 31
<b>Total Estimated Trip Generation</b>	<b>3743</b>		<b>287</b>	68	219	<b>386</b>	245	141

<sup>1</sup> Source: *Trip Generation*, 7th Edition, ITE, 2003, average rates.

<sup>2</sup> Source: *Trip Generation*, 7th Edition, ITE, 2003. Rate shown based on fitted curve evaluation. ADT:  $T = 6.01X + 150.35$ . AM:  $T = 0.49X + 3.73$ . PM:  $T = 0.55X + 17.65$ .

Alternative No. 2 (elementary school alternative) will include 248 single-family units and 128 apartment units. This scenario adds the future 600-student elementary school being planned by the Camas School District. The trip generation is projected to yield an ADT of 4,067 trips with 504 AM peak hour trips and 382 trips in the PM peak hour.

**Table 2 Projected Trip Generation for Residential & New Elementary School**

ITE Land Use	Units	Weekday									
		ADT	AM Peak Hour			Mid-Afternoon Peak			PM Peak Hour		
			Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit
Single-Family (#210) Generation Rate <sup>1</sup> Site Trips	248 homes	9.57 2373	0.75 186	25% 47	75% 139				1.01 250	63% 158	37% 92
Apartment (#220) Generation Rate <sup>2</sup> Site Trips	128 apartments	3.71 920	0.27 66	20% 13	80% 53				0.35 88	65% 57	35% 31
Elementary School (#520) Generation Rate <sup>3,4</sup> Site Trips	600 students	1.29 774	0.42 252	55% 139	45% 113	0.28 168	45% 76	55% 92	0.074 44	45% 20	55% 24
<b>Total Estimated Trip Generation</b>	<b>4067</b>		<b>504</b>	199	305	<b>168</b>	76	92	<b>382</b>	235	147

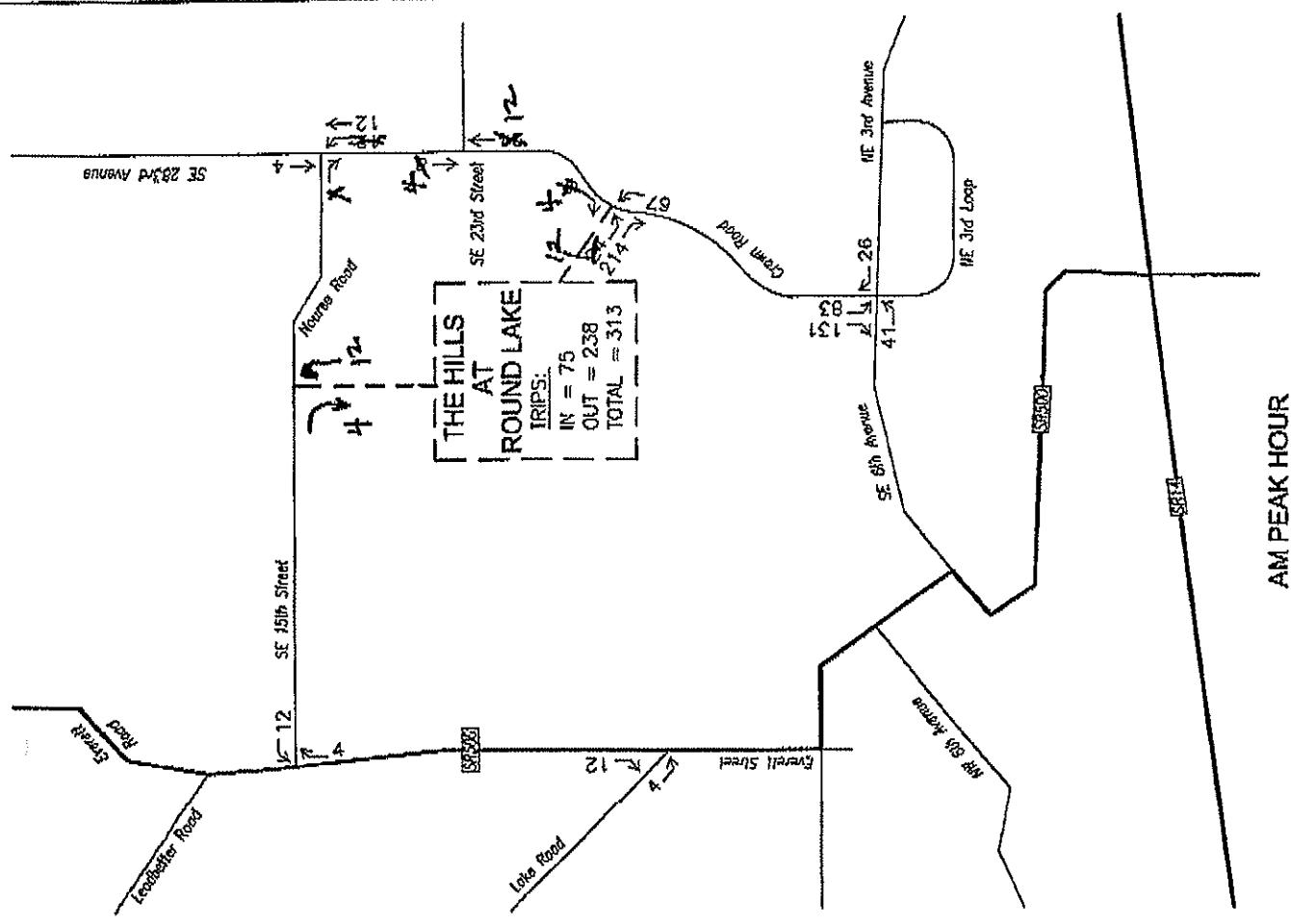
<sup>1</sup> Source: *Trip Generation*, 7th Edition, ITE, 2003, average rates.

<sup>2</sup> Source: *Trip Generation*, 7th Edition, ITE, 2003. Rate shown based on fitted curve evaluation. ADT:  $T = 6.01X + 150.35$ . AM:  $T = 0.49X + 3.73$ . PM:  $T = 0.55X + 17.65$ .

<sup>3</sup> Source: *Trip Generation*, 7th Edition, ITE, 2003, ADT, AM peak, and Mid-afternoon peak average rates.

<sup>4</sup> Source: PM peak trip rate calculated from Sherwood, Oregon elementary schools, May 1999.

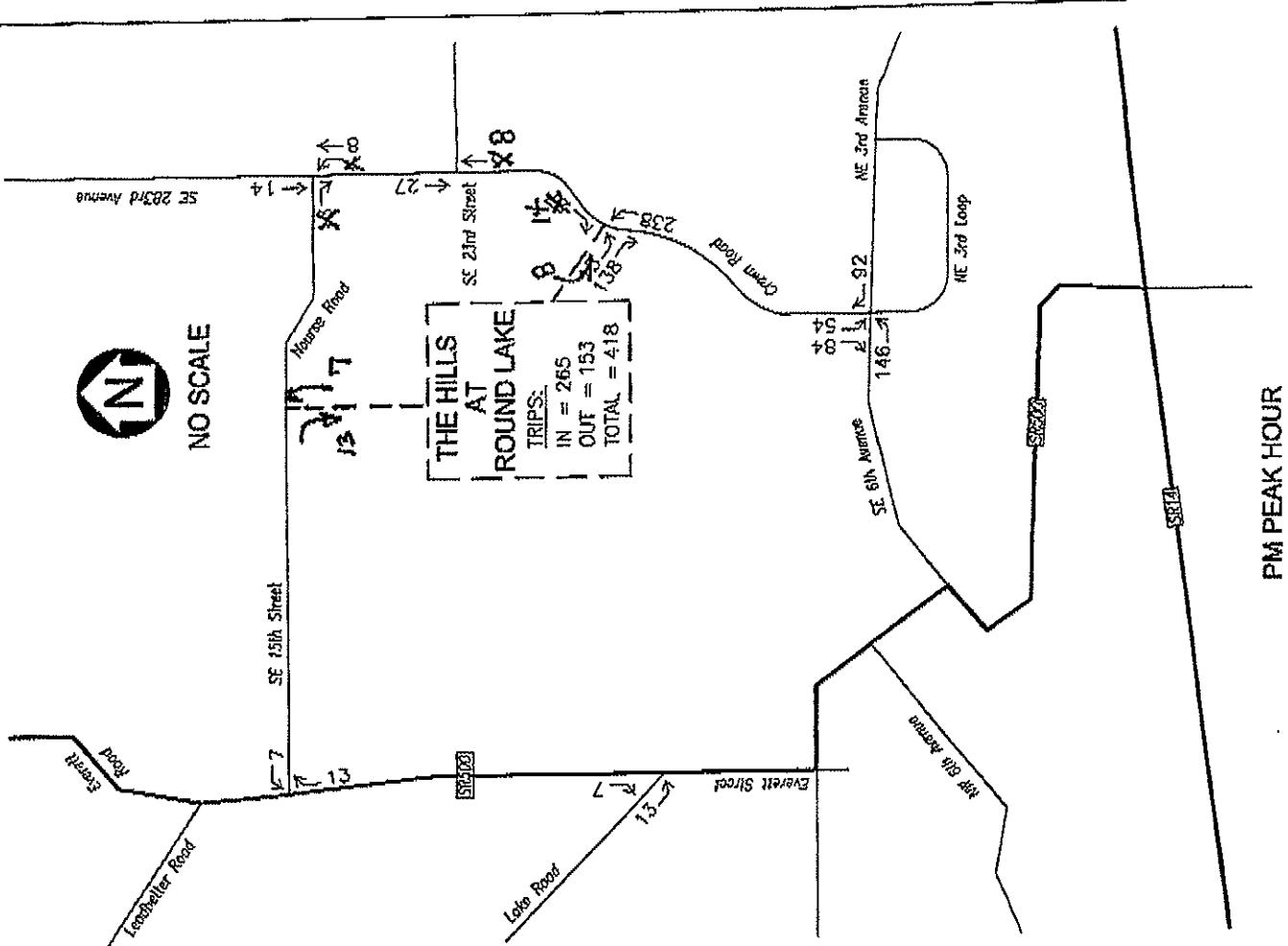
If you should have any questions regarding this information, please contact Frank Charbonneau, P.E.



**CHARBONNEAU  
ENGINEERING LLC**  
PROJECT: 05-04

NOTES: Trip generation based on  
Single-Family Residential (ITE 210) and  
Apartment (ITE 220) trip rates.

Updated w/ North Access  
12/17/05  
F.C.



**FIGURE 5**  
**THE HILLS AT ROUND LAKE**



Camas City Staff  
February 11, 2010  
Page 2 of 4

*NE 43<sup>rd</sup> Avenue/SE Nourse Road* is a two-lane arterial roadway with additional turn pockets at major intersections. The posted speed limit is 25 mph from NE Everett Street to SE 271<sup>st</sup> Avenue. East of SE 271<sup>st</sup> Avenue, the speed limit changes to 40 mph. Intermittent sidewalks exist along both sides of the roadway.

*SE 283<sup>rd</sup> Avenue/SE Crown Road* is a two-lane arterial roadway with a posted speed limit of 40 mph. Some intermittent shoulders exist along the roadway.

*NE 3<sup>rd</sup> Avenue* is a four-lane arterial roadway with additional turn pockets at major intersections. The posted speed limit is 25 mph west of East First Avenue. East of East First Avenue, the speed limit changes to 40 mph. Sidewalks exist along both sides of the roadway.

## TRIP GENERATION

Estimates of daily, A.M. peak hour, and P.M. peak hour trips generated by the proposed project were developed from rates published in "Trip Generation, 8<sup>th</sup> Edition" (Institute of Transportation Engineers, 2008). The proposed development is expected to generate 478 new daily trips, 37 new A.M. peak hour (10 in, 27 out), and 51 new P.M. peak hour (32 in, 19 out) trips. Table 1 summarizes the trip generation for North Hills Subdivision development.

Table 1. Trip Generation Summary for North Hills Subdivision

	Average Daily	A.M. Peak			P.M. Peak		
		In	Out	Total	In	Out	Total
<b>Single Family Residential (ITE Code 210)</b>							
Rate per unit	9.57	0.19	0.56	0.75	0.64	0.37	1.01
	488	10	28	38	33	19	52
<b>Existing Single family (ITE Code 210)</b>							
Rate per unit	9.57	0.19	0.56	0.75	0.64	0.37	1.01
1 existing single family unit	10	0	1	1	1	0	1
Net new trips	478	10	27	37	32	19	51



Camas City Staff  
February 11, 2010  
Page 3 of 4

## TRIP DISTRIBUTION

A generalized trip distribution pattern for the A.M. and P.M. peak hour was developed from the existing traffic counts; previous traffic studies, locations of major employment centers, and logical travel paths to and from major travel corridors. The trip distribution pattern is listed below:

- SE 283<sup>rd</sup> Avenue to and from the north – 5%
- NE Everett Street to and from the north – 10%
- Camas High School – 5%
- NE Lake Road – 10%
- NE Everett Street to and from the south – 20%
- SE Crown Road to and from the south – 50%

Based on the trip distribution pattern above, the project-generated trip impact at the following study area intersection was calculated:

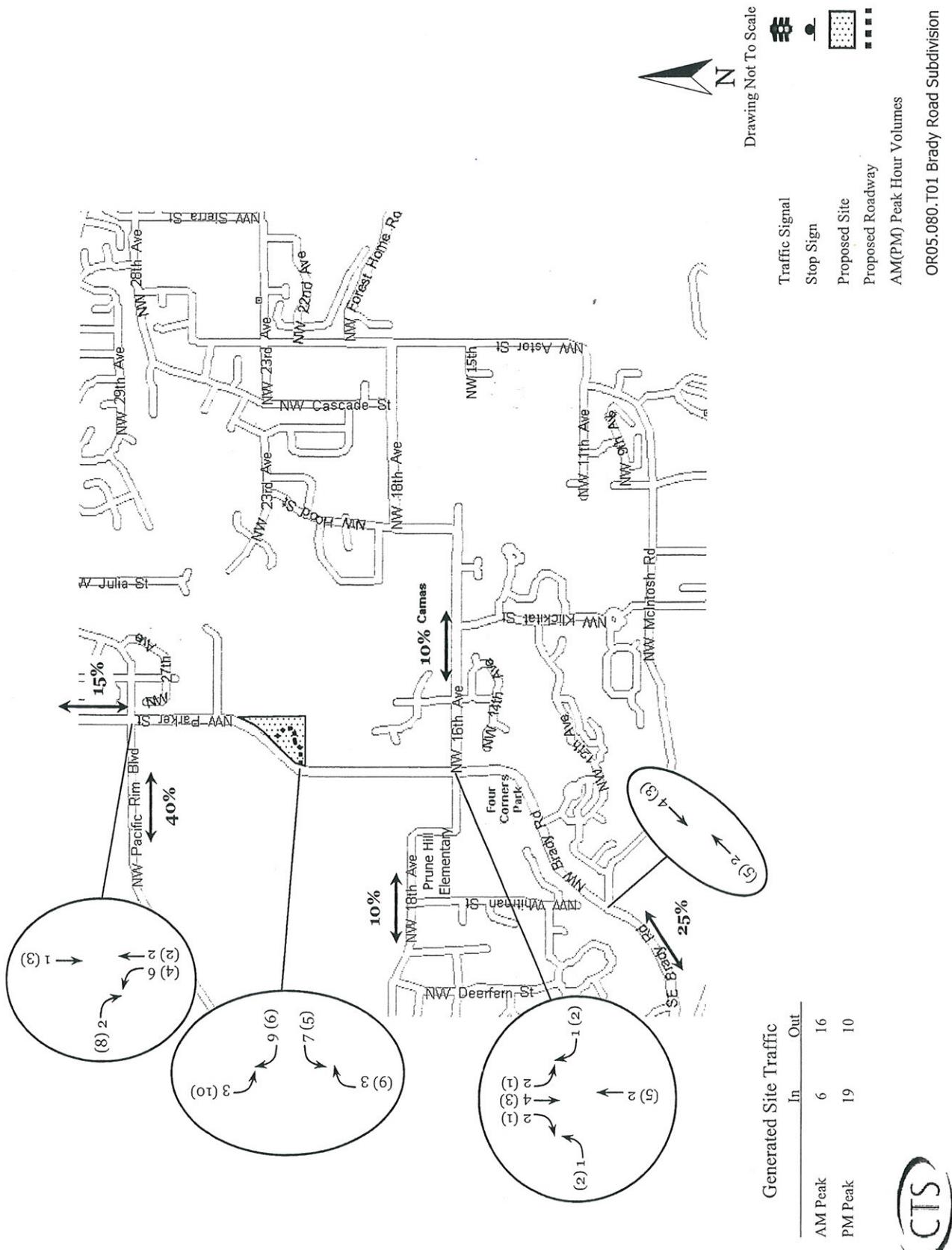
- NE Everett Street (SR 500)/NE 43<sup>rd</sup> Avenue
- NE Everett Street (SR 500)/NE Lake Road
- SE 277<sup>th</sup> Avenue/SE Nourse Road
- SE 283<sup>rd</sup> Avenue/SE Crown Road/SE Nourse Road
- SE Crown Road/NE 3<sup>rd</sup> Avenue

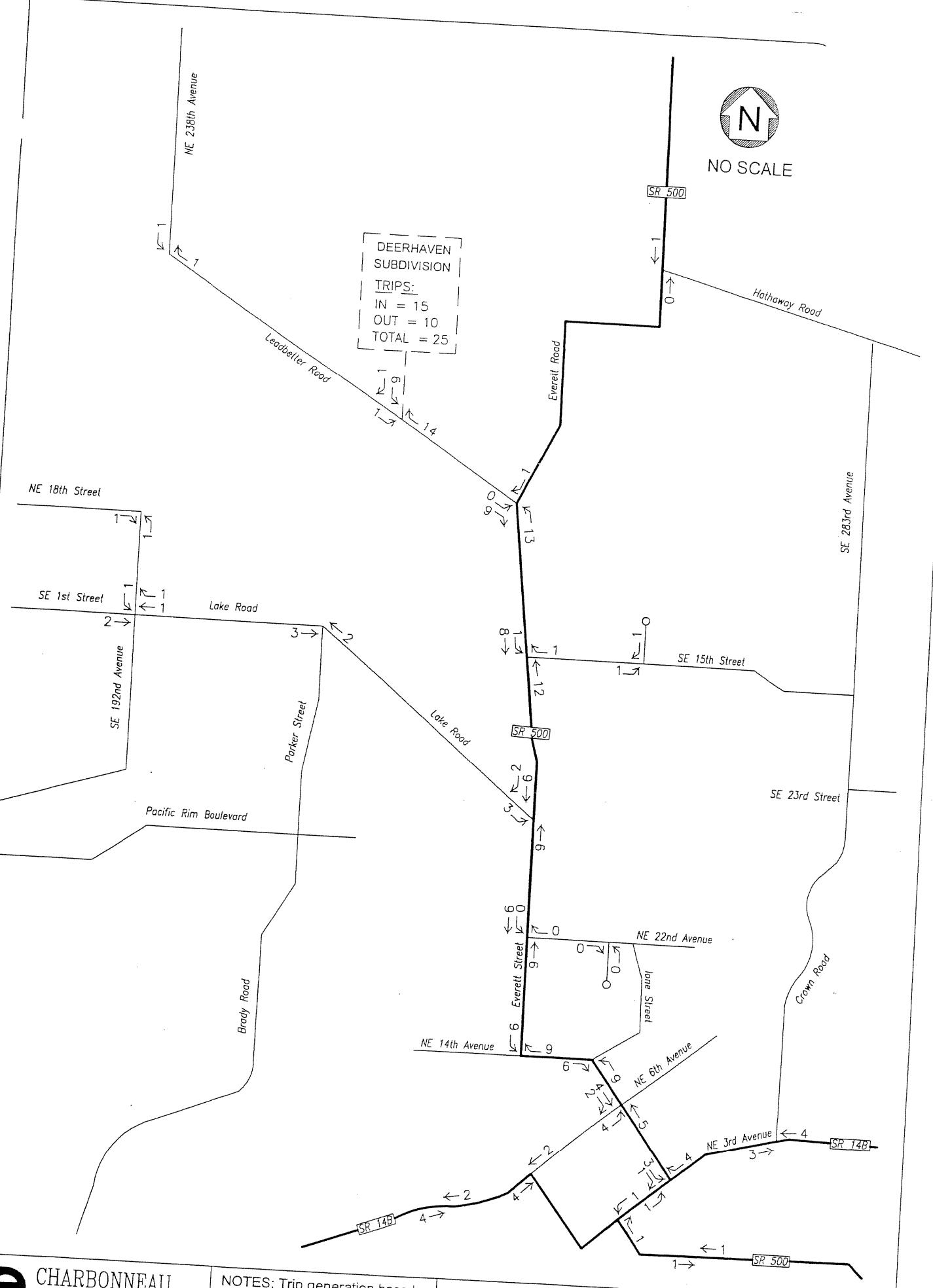
Table 2 summarizes the A.M. and P.M. peak hour traffic impacts created by the North Hills Subdivision at the study area intersections.

**Table 2. Project Trip Impact Summary**

	A.M. Peak			P.M. Peak		
	In	Out	Total	In	Out	Total
NE Everett St/NE 43 <sup>rd</sup> Av	4	11	15	12	8	20
NE Everett St/NE Lake Rd	3	8	11	9	6	15
SE 277 <sup>th</sup> Av/SE Nourse Rd	10	27	37	32	19	51
SE 283 <sup>rd</sup> Av/SE Crown Rd/SE Nourse Rd	5	15	20	18	10	28
SE Crown Rd/NE 3 <sup>rd</sup> Av	5	14	19	16	9	25

Figure 8: Weekday Peak Hour Traffic Volumes Generated By Brady Road Subdivision





NOTES: Trip generation based on Single-Family Residential (ITE 210) trip rates.

TRIP ASSIGNMENT  
PM PEAK HOUR

FIGURE

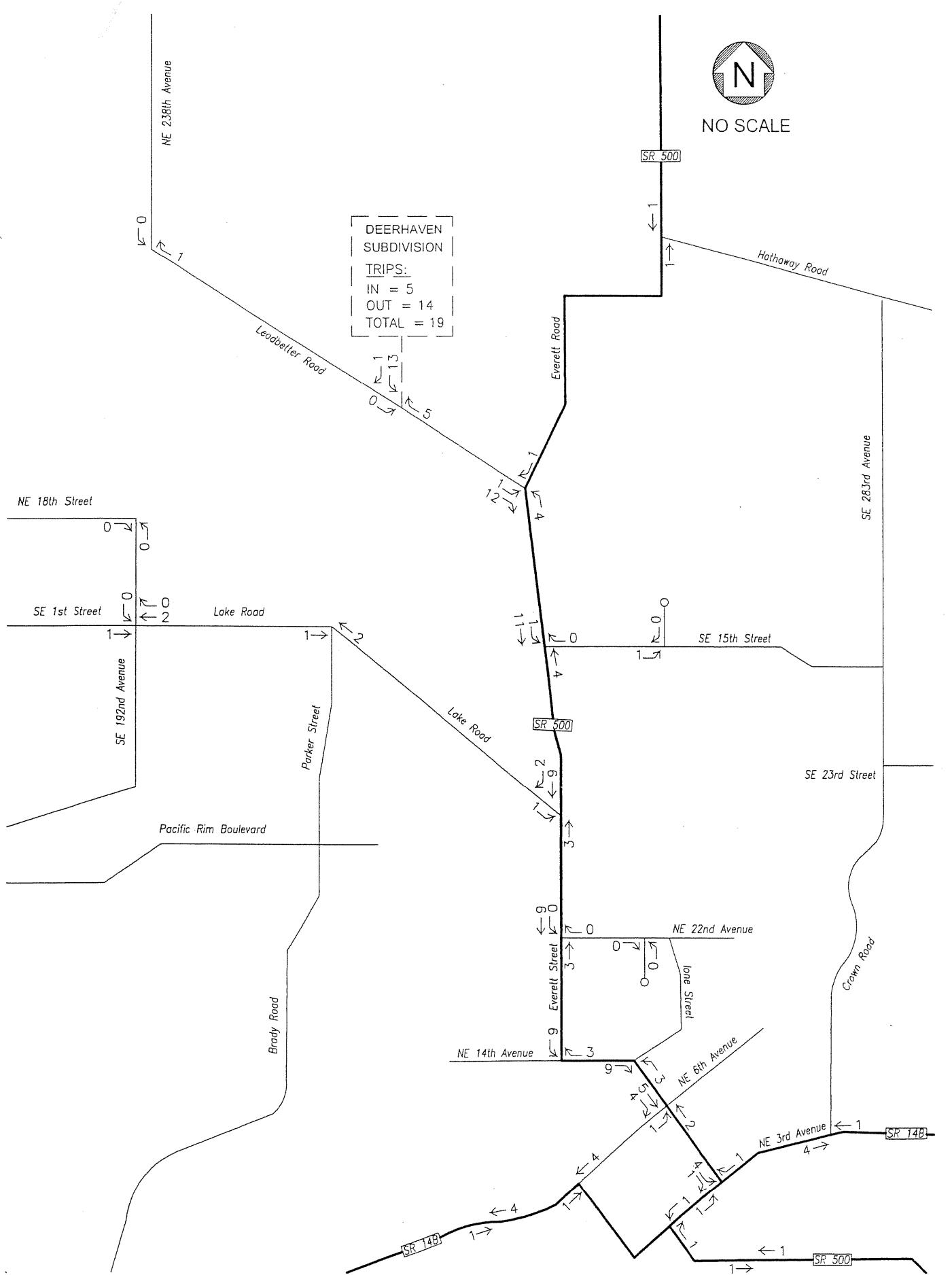
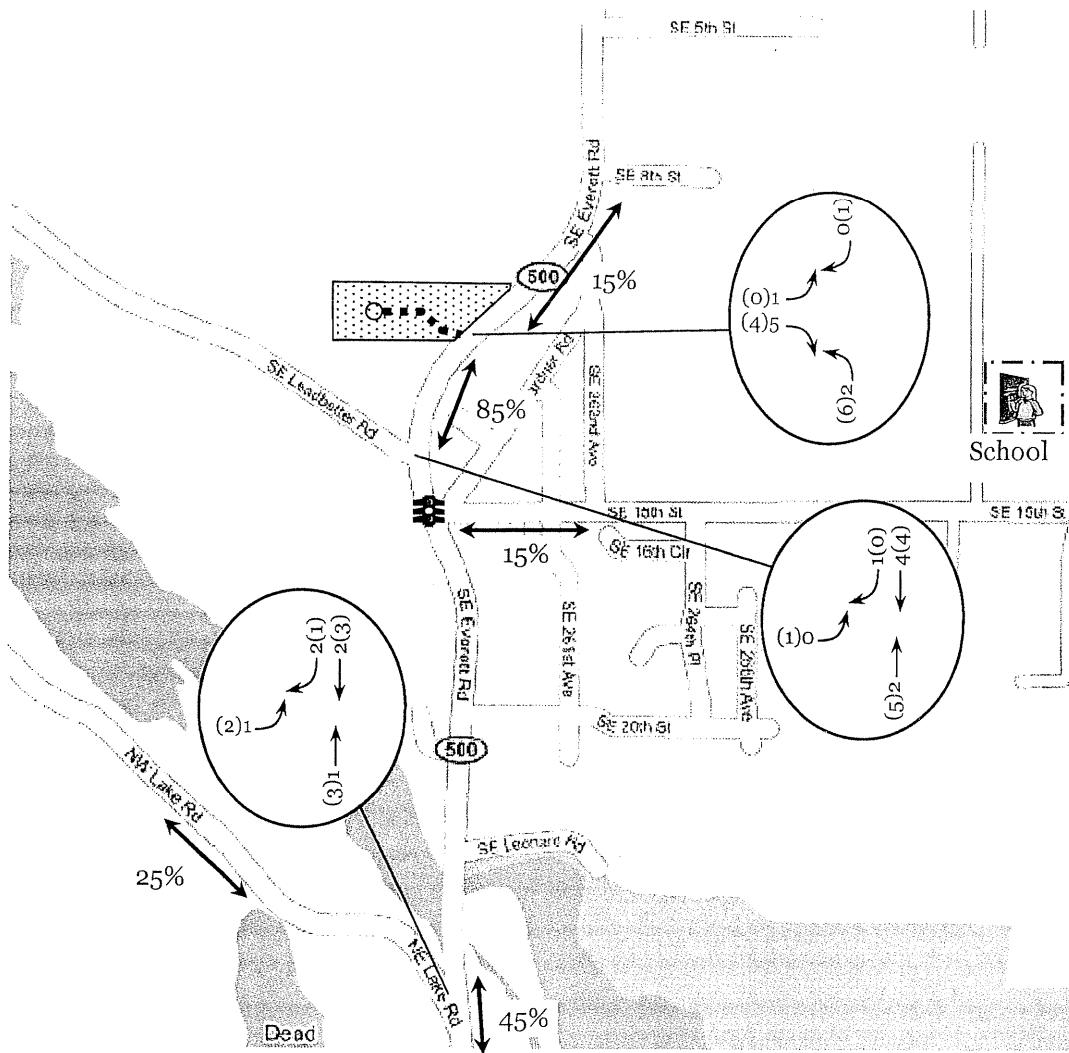


Figure 4: Weekday Peak Hour Traffic Volumes Generated  
By Hadley's Glen



Site Generated Traffic

	In	Out
AM Peak	2	6
PM Peak	7	4

Net New Generated Site Traffic

	In	Out
AM Peak	2	5
PM Peak	6	4



Drawing Not To Scale

Proposed Site

Proposed Roadway

AM(PM) Peak Hour Volumes



OR05.050.T11 Hadley's Glen

FISHER CR. CAMPUSS

BLOCKS, 1 &amp; 2



(NO SCALE)

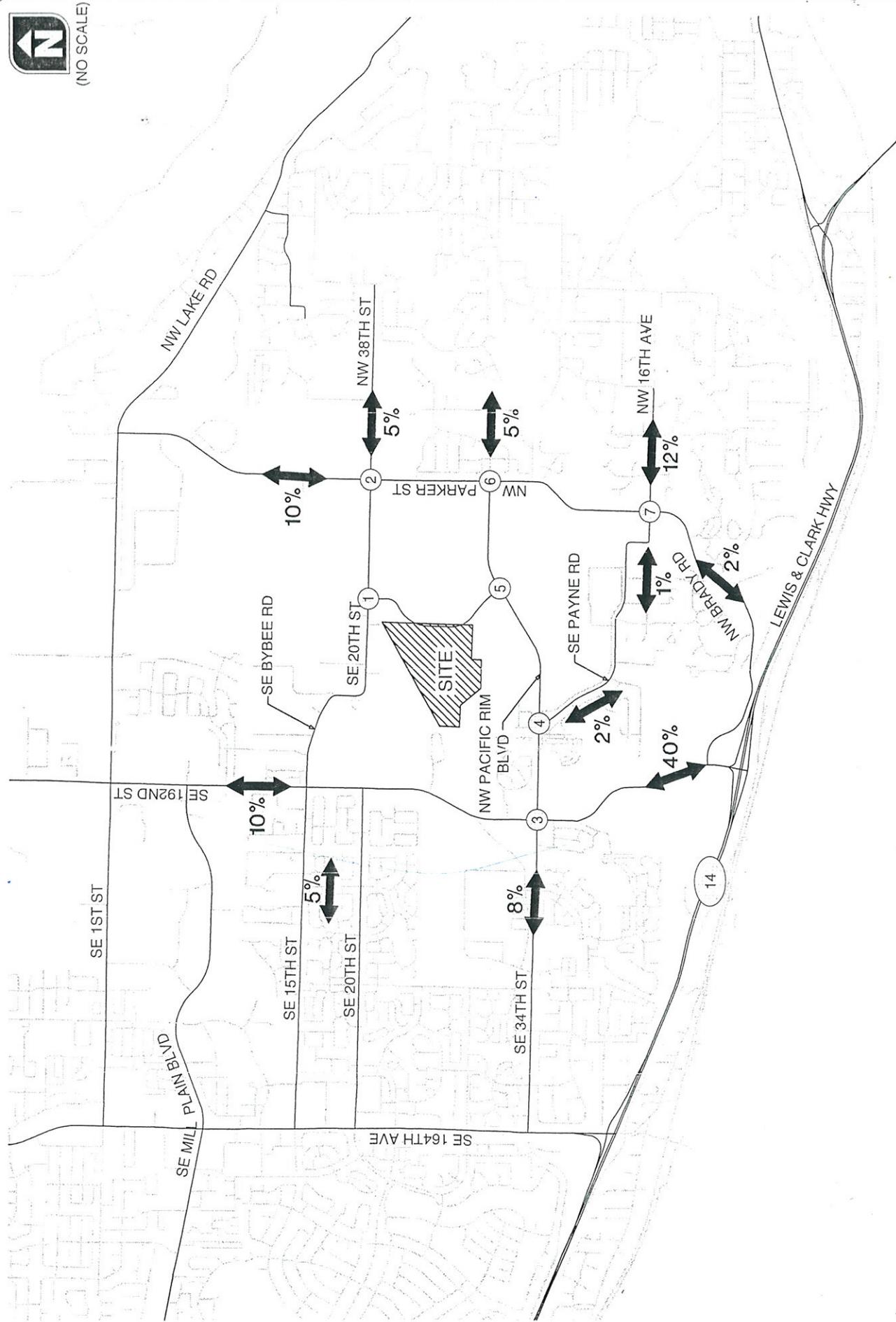
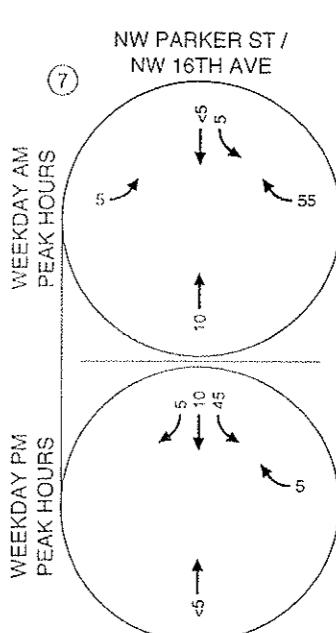
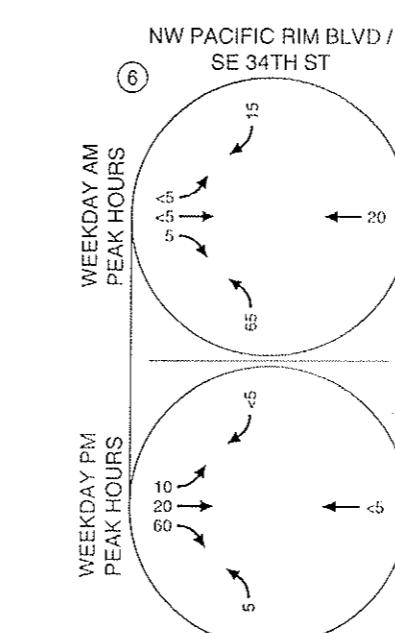
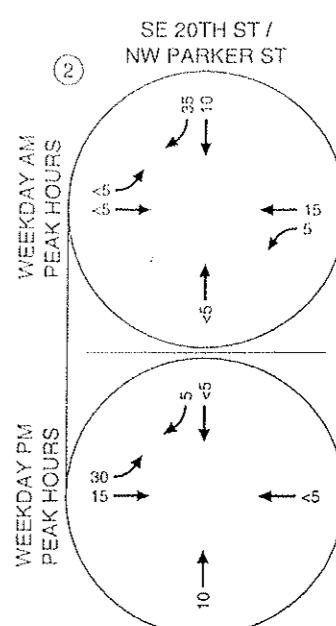
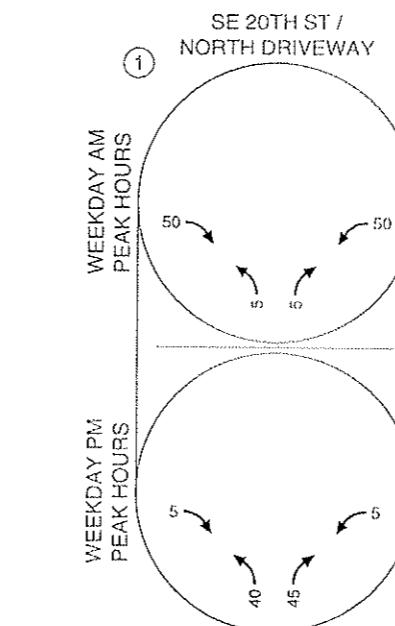
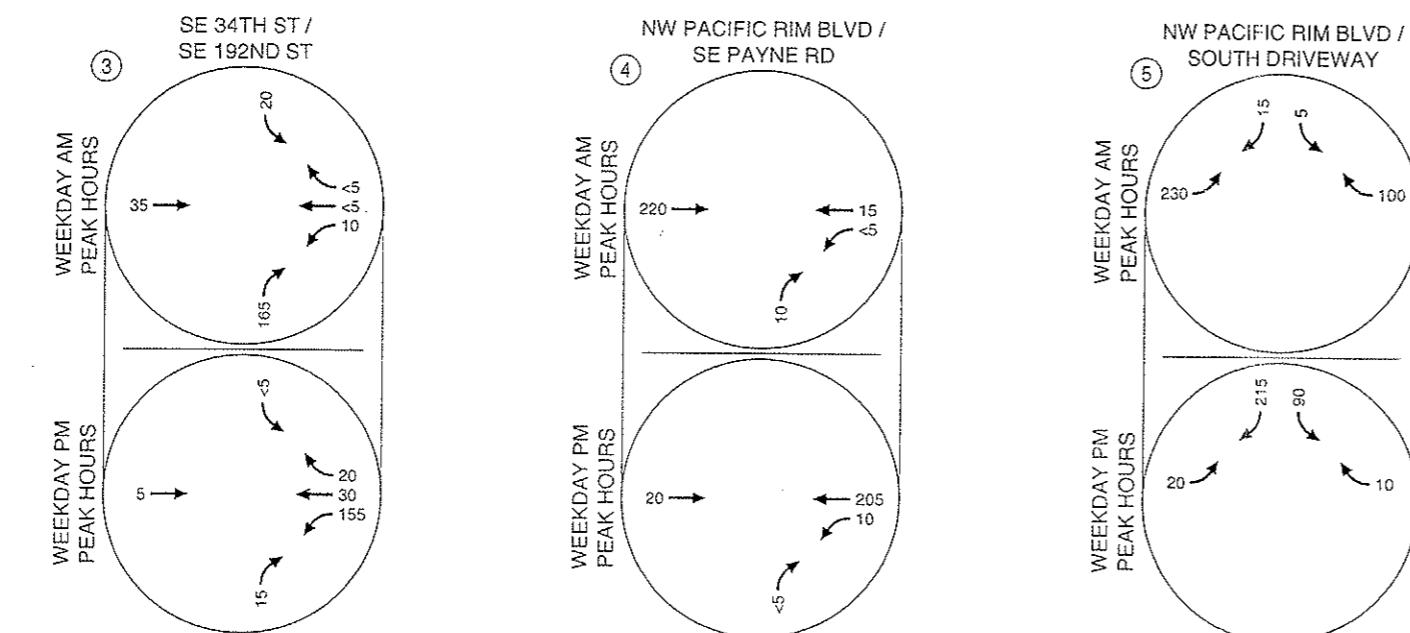
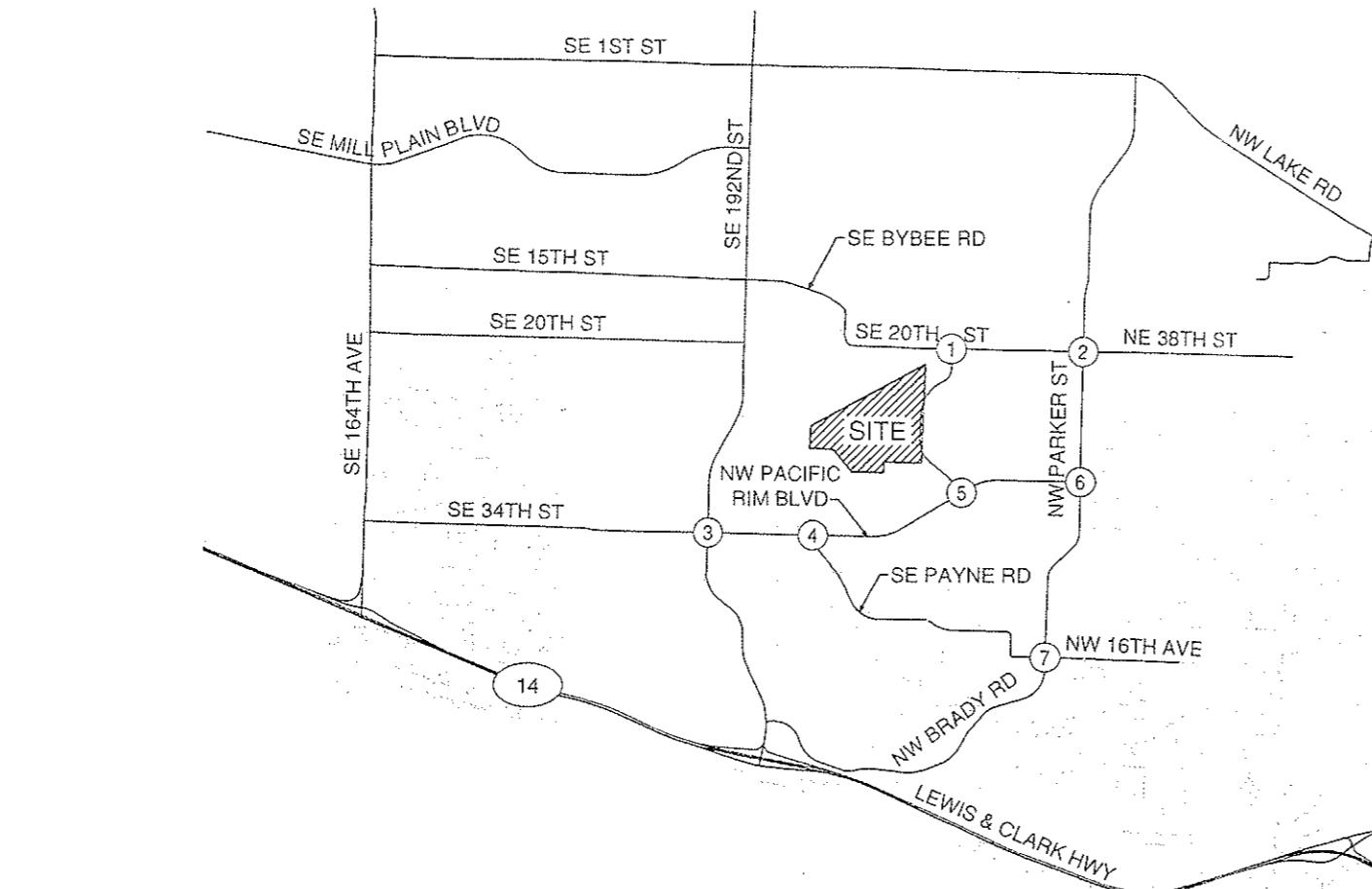


FIGURE  
3  
ESTIMATED TRIP DISTRIBUTION  
CAMPUS, WASHINGTON



PHASE 1-2 WEEKDAY AM AND PM PEAK HOUR SITE-GENERATED TRIPS  
CAMSAS, WASHINGTON

FIGURE  
5

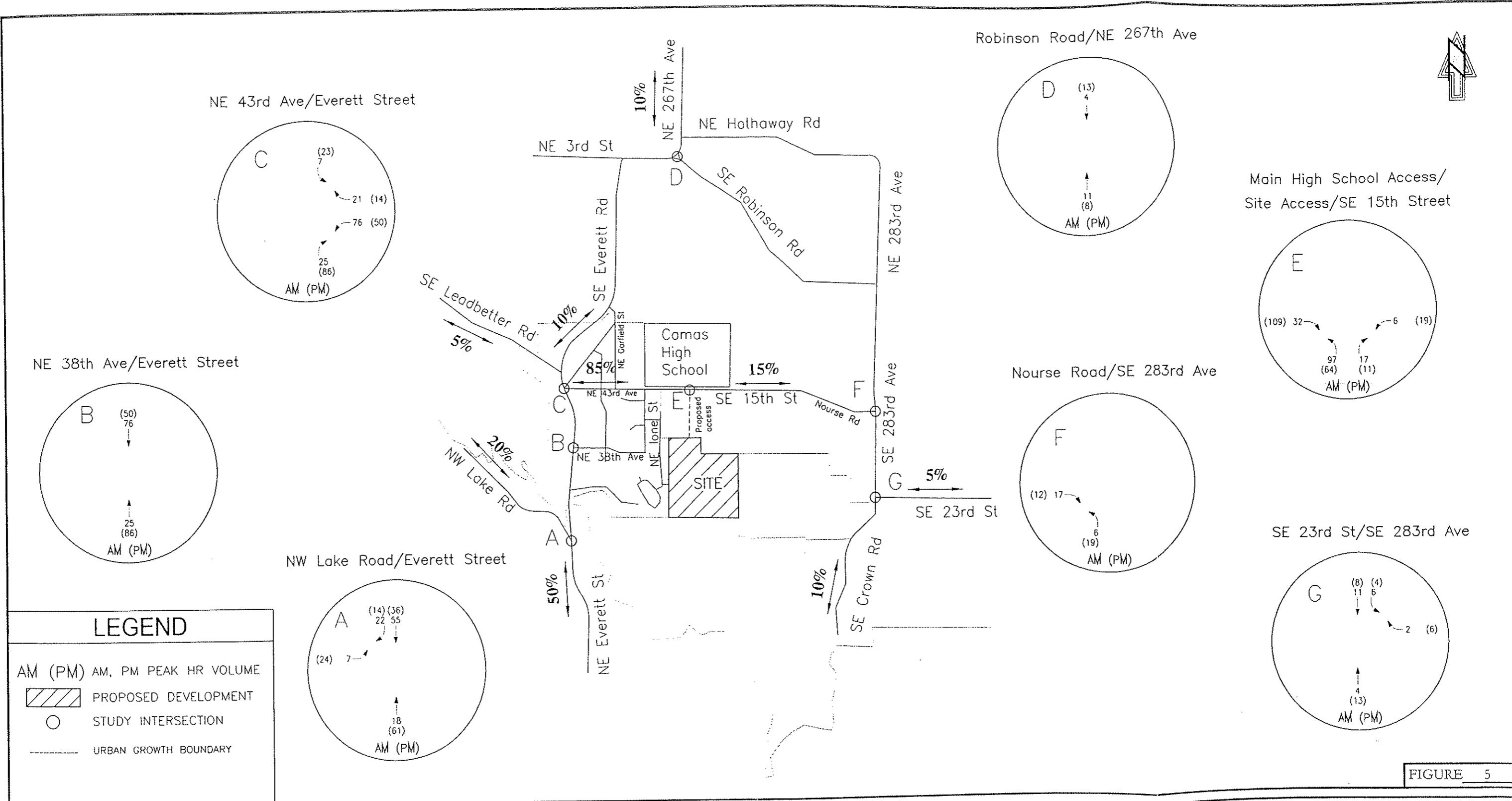


FIGURE 5

**HOPPER  
JDENNIS  
JELLISON**  
P.L.L.C.

ENGINEERS & PLANNERS  
314 W. 15th Street  
Vancouver, WA 98660-2927  
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(503) 924-4005  
FAX (360) 695-8767  
Internet: [www.hdjengineers.com](http://www.hdjengineers.com)

SITE GENERATED TRIPS & TRIP DISTRIBUTION  
**MILLSHORE DOWNS**

Generally, a crash rate greater than one crash per million entering vehicles (MEV) at an intersection is an indicator that a potential geometric or operational issue may exist and that further evaluation should be considered. Table 2 summarizes the intersection crash history.

Table 2 Intersection Crash Histories (January 1, 2006 through December 31, 2010)

Intersection	Number of Crashes	Collision Type					Severity			Crash Rate <sup>2</sup> (per MEV <sup>3</sup> )
		Rear End	Turning/ Side Swipe	Angle	Fixed Object	Other	PDO <sup>1</sup>	Injury	Fatal	
NW 38 <sup>th</sup> Avenue/ SE 192 <sup>nd</sup> Avenue	5	2	1	0	2	0	3	2	0	0.14
NW 38 <sup>th</sup> Avenue/ NW Parker Street	6	0	1	4	1	0	5	1	0	0.32
NW Pacific Rim Blvd./ NW Parker Street	2	0	0	1	1	0	1	1	0	0.13
NW 16 <sup>th</sup> Avenue/ NW Brady Road	2	0	0	1	1	0	1	1	0	0.13

<sup>1</sup> Property Damage Only

<sup>2</sup> Crash Rate = (Total Crashes) / (365 days/year x daily entering vehicles / 1,000,000)

<sup>3</sup> MEV – Million Entering Vehicles

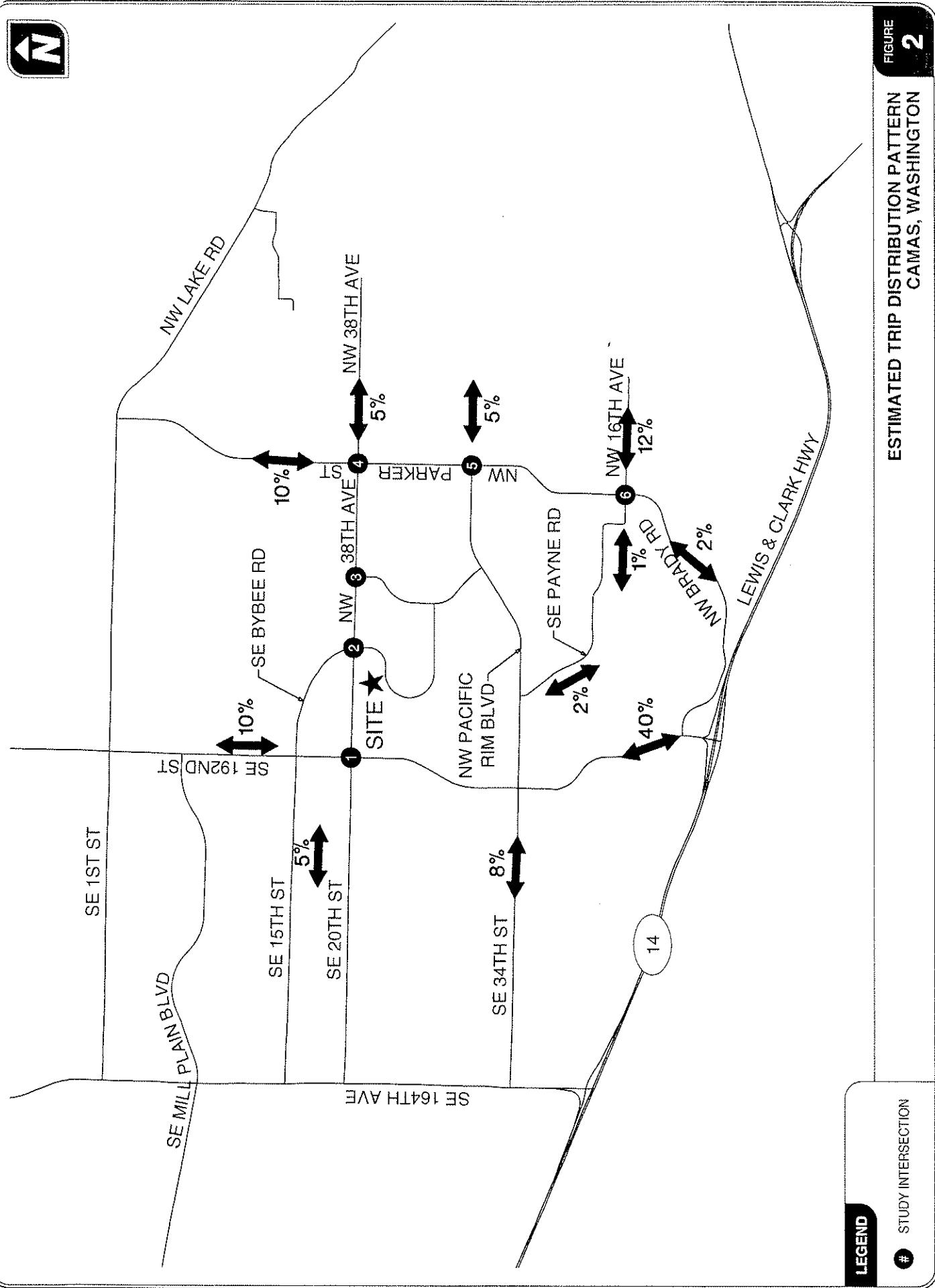
As shown in Table 2, each study intersection's crash rate is less than 1.0 crashes/MEV, there were no fatalities reported during the time periods studied, and no correctable safety issues were identified on the basis of the crash rate comparison alone. Attachment "A" contains the crash data.

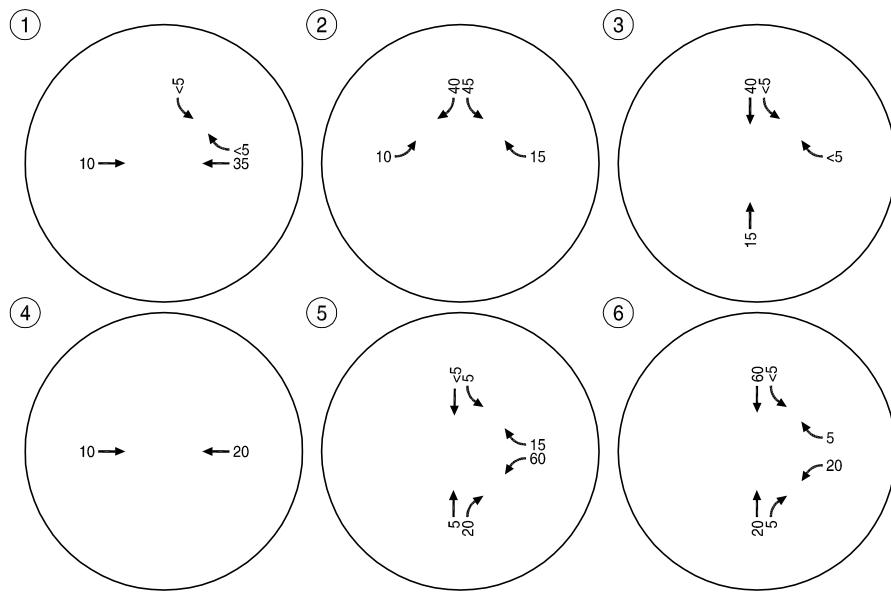
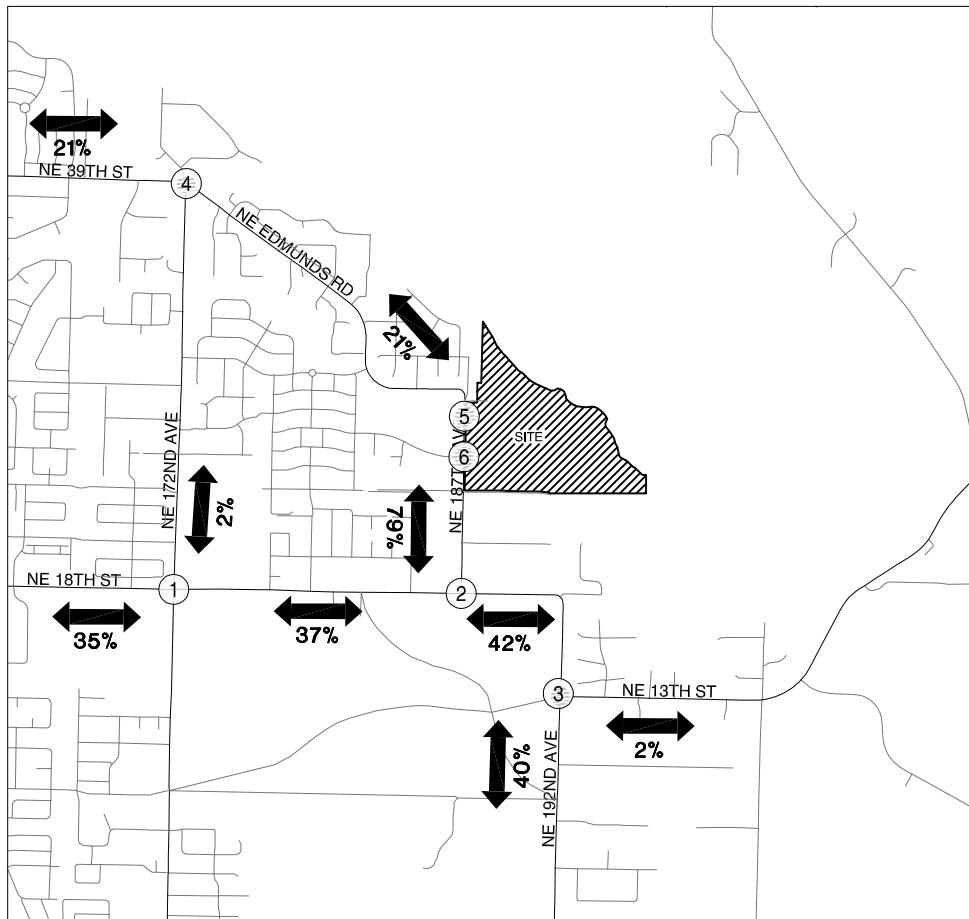
## Proposed Development Trip Generation Estimate

Estimates of daily and weekday a.m. and p.m. peak hour vehicle trip ends for the proposed Fisher Creek Campus were calculated from empirical observations at other similar developments. These observations were obtained from the standard reference manual, *Trip Generation, 8<sup>th</sup> Edition*, published by the Institute of Transportation Engineers (ITE, Reference 3). Table 3 shows the estimated trip generation associated the proposed buildings. The daily trips shown in Table 3 were rounded to the nearest even number while the weekday a.m. and p.m. peak hour trips were rounded to the nearest trip.

Table 3 Trip Generation Estimate

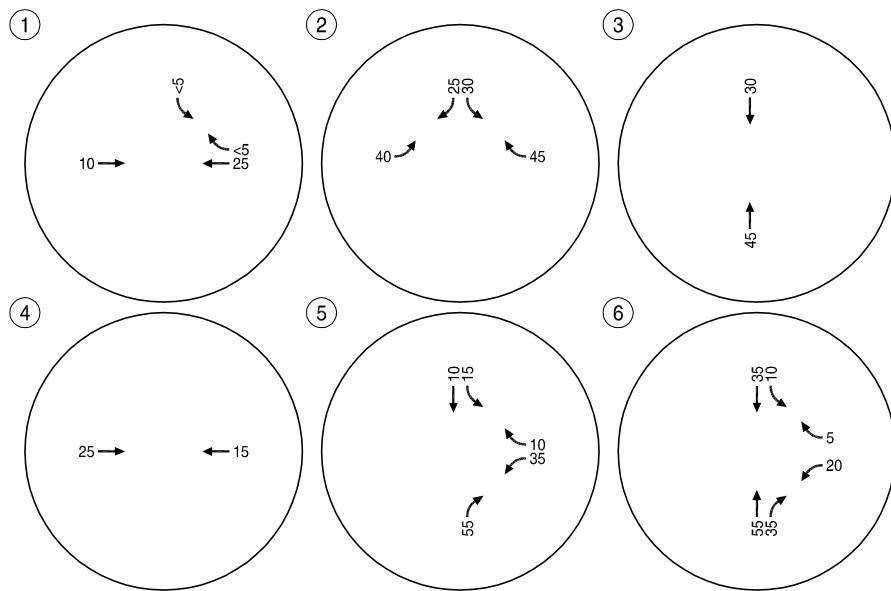
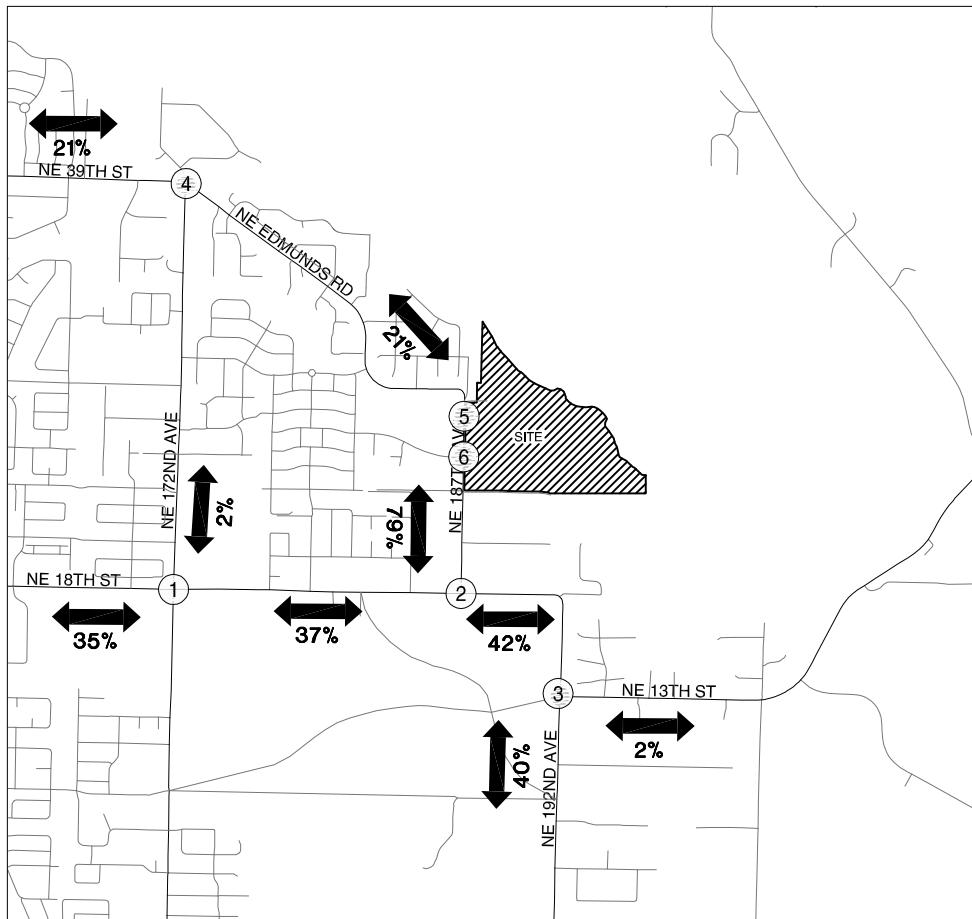
ITE Land Use	ITE Code	Size (square feet)	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Corporate Headquarters Building	714	107,256	856	160	149	11	150	15	135

FIGURE  
2



**ESTIMATED TRIP DISTRIBUTION PATTERN & SITE-GENERATED TRIPS  
WEEKDAY AM PEAK HOURS  
CLARK COUNTY, WASHINGTON**

FIGURE  
**10**



**ESTIMATED TRIP DISTRIBUTION PATTERN & SITE-GENERATED TRIPS  
WEEKDAY PM PEAK HOURS  
CLARK COUNTY, WASHINGTON**

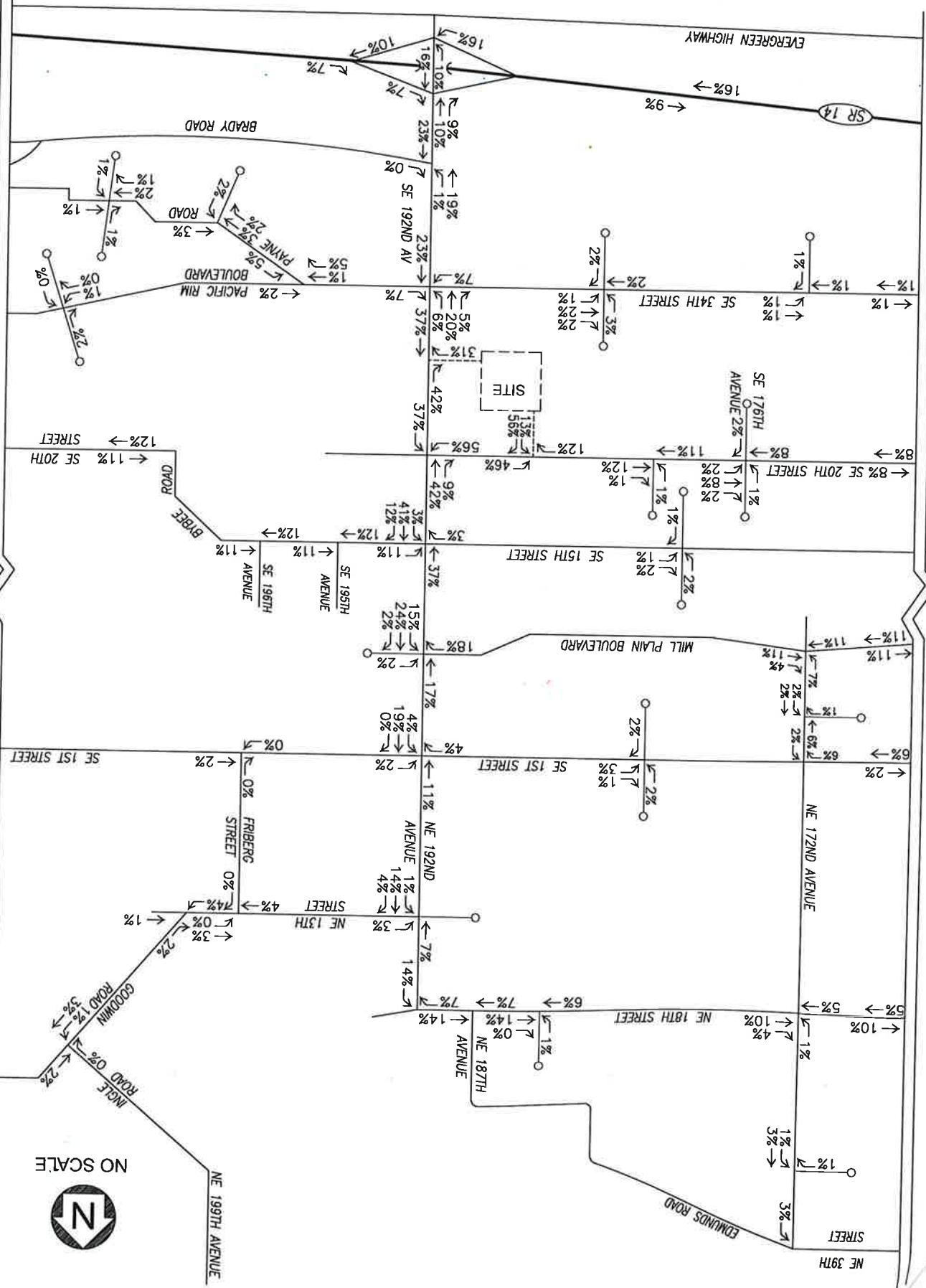
FIGURE  
**11**

PLOT DATE: 06.13.13

FILE NAME: 1310flow.dwg

**SEE FIGURE 4b**

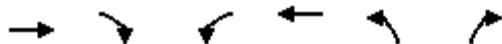
SEE FIGURE 4b



SEE FIGURE 4d

SEE FIGURE 4d

## Appendix G 2018 Background Conditions Worksheets



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑ ↗		↗ ↙	↖ ↗	↖ ↙	
Volume (veh/h)	53	180	14	183	158	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	62	209	16	213	184	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		271		412	166	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		271		412	166	
tC, single (s)		4.1		6.4	7.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	4.2	
p0 queue free %		99		69	99	
cM capacity (veh/h)		1304		585	676	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	271	229	188			
Volume Left	0	16	184			
Volume Right	209	0	5			
cSH	1700	1304	587			
Volume to Capacity	0.16	0.01	0.32			
Queue Length 95th (ft)	0	1	34			
Control Delay (s)	0.0	0.7	14.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.7	14.0			
Approach LOS			B			
Intersection Summary						
Average Delay		4.0				
Intersection Capacity Utilization		36.8%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	188	223	307	74	548	358
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8		5.4		5.7	5.4
Lane Util. Factor	1.00		1.00		1.00	1.00
Fr <sub>t</sub>	0.93		0.97		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1608		1645		1805	1881
Flt Permitted	0.98		1.00		0.23	1.00
Satd. Flow (perm)	1608		1645		428	1881
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	188	223	307	74	548	358
RTOR Reduction (vph)	27	0	7	0	0	0
Lane Group Flow (vph)	384	0	374	0	548	358
Heavy Vehicles (%)	0%	13%	14%	6%	0%	1%
Turn Type				pm+pt		
Protected Phases	6		4		3	8
Permitted Phases					8	
Actuated Green, G (s)	30.4		27.1		55.2	55.2
Effective Green, g (s)	30.4		27.1		55.2	55.2
Actuated g/C Ratio	0.31		0.28		0.57	0.57
Clearance Time (s)	5.8		5.4		5.7	5.4
Vehicle Extension (s)	1.0		1.0		1.0	1.0
Lane Grp Cap (vph)	505		461		563	1073
v/s Ratio Prot	c0.24		0.23		c0.23	0.19
v/s Ratio Perm					c0.33	
v/c Ratio	0.76		0.81		0.97	0.33
Uniform Delay, d1	29.9		32.5		21.1	11.0
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	5.8		9.9		30.9	0.1
Delay (s)	35.7		42.3		52.0	11.1
Level of Service	D		D		D	B
Approach Delay (s)	35.7		42.3			35.9
Approach LOS	D		D			D
Intersection Summary						
HCM Average Control Delay		37.3		HCM Level of Service		D
HCM Volume to Capacity ratio		0.87				
Actuated Cycle Length (s)		96.8		Sum of lost time (s)		11.5
Intersection Capacity Utilization		88.9%		ICU Level of Service		E
Analysis Period (min)		15				
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	115	279	100	254	1	84	2	28	2	5	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	0.85	1.00	1.00	1.00	1.00	1.00	0.85	0.85	0.97		
Flt Protected	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00	1.00	0.99		
Satd. Flow (prot)	1757	1615	1671	1817	1817	1817	1636	1417	1417	1486		
Flt Permitted	1.00	1.00	0.95	1.00	1.00	1.00	0.72	1.00	1.00	0.94		
Satd. Flow (perm)	1751	1615	1671	1817	1817	1817	1237	1417	1417	1407		
Peak-hour factor, PHF	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Adj. Flow (vph)	2	174	423	152	385	2	127	3	42	3	8	3
RTOR Reduction (vph)	0	0	271	0	0	0	0	0	34	0	2	0
Lane Group Flow (vph)	0	176	152	152	387	0	0	130	8	0	12	0
Confl. Peds. (#/hr)	1				1							
Heavy Vehicles (%)	100%	7%	0%	8%	4%	100%	11%	0%	14%	0%	40%	0%
Turn Type	Perm		Perm	Prot			Perm		Perm	Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4				2		2	6		
Actuated Green, G (s)	16.0	16.0	7.9	27.9				8.5	8.5	8.5		
Effective Green, g (s)	16.0	16.0	7.9	27.9				8.5	8.5	8.5		
Actuated g/C Ratio	0.36	0.36	0.18	0.63			0.19	0.19	0.19	0.19		
Clearance Time (s)	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	631	582	297	1142			237	271	271	269		
v/s Ratio Prot			c0.09	c0.21								
v/s Ratio Perm	0.10	0.09					c0.11	0.01	0.01	0.01		
v/c Ratio	0.28	0.26	0.51	0.34			0.55	0.03	0.03	0.04		
Uniform Delay, d1	10.1	10.0	16.5	3.9			16.2	14.6	14.6	14.6		
Progression Factor	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00		
Incremental Delay, d2	0.2	0.2	1.5	0.2			2.6	0.0	0.0	0.1		
Delay (s)	10.3	10.3	18.0	4.1			18.8	14.6	14.6	14.7		
Level of Service	B	B	B	A			B	B	B	B		
Approach Delay (s)	10.3			8.0			17.8			14.7		
Approach LOS	B			A			B			B		
<b>Intersection Summary</b>												
HCM Average Control Delay	10.4				HCM Level of Service			B				
HCM Volume to Capacity ratio	0.41											
Actuated Cycle Length (s)	44.4				Sum of lost time (s)			8.0				
Intersection Capacity Utilization	44.3%				ICU Level of Service			A				
Analysis Period (min)	15											
c Critical Lane Group												



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	61	69	213	104	36	171
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	69	78	239	117	40	192
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	356			512	298	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	356			512	298	
tC, single (s)	4.2			6.5	6.2	
tC, 2 stage (s)						
tF (s)	2.3			3.6	3.3	
p0 queue free %	94			92	74	
cM capacity (veh/h)	1170			481	735	
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	146	356	40	192		
Volume Left	69	0	40	0		
Volume Right	0	117	0	192		
cSH	1170	1700	481	735		
Volume to Capacity	0.06	0.21	0.08	0.26		
Queue Length 95th (ft)	5	0	7	26		
Control Delay (s)	4.1	0.0	13.2	11.6		
Lane LOS	A		B	B		
Approach Delay (s)	4.1	0.0	11.9			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			4.6			
Intersection Capacity Utilization		37.9%		ICU Level of Service		A
Analysis Period (min)			15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	63	41	4	236	0	64	1	3	0	2	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	68	45	4	257	0	70	1	3	0	2	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	257			113			364	358	91	362	380	257
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	257			113			364	358	91	362	380	257
tC, single (s)	4.1			4.3			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			88	100	100	100	100	99
cM capacity (veh/h)	1320			1345			585	569	972	593	553	787
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	114	261	74	7								
Volume Left	1	4	70	0								
Volume Right	45	0	3	4								
cSH	1320	1345	596	690								
Volume to Capacity	0.00	0.00	0.12	0.01								
Queue Length 95th (ft)	0	0	11	1								
Control Delay (s)	0.1	0.2	11.9	10.3								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.9	10.3								
Approach LOS			B	B								
<b>Intersection Summary</b>												
Average Delay			2.2									
Intersection Capacity Utilization		32.0%		ICU Level of Service					A			
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	67	3	0	190	48	2	0	0	61	1	57
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	10	87	4	0	247	62	3	0	0	79	1	74
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	309			91			462	419	89	388	390	278
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	309			91			462	419	89	388	390	278
tC, single (s)	4.3			4.1			8.1	6.5	6.2	7.2	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			4.4	4.0	3.3	3.6	4.0	3.4
p0 queue free %	99			100			99	100	100	86	100	90
cM capacity (veh/h)	1132			1517			338	524	975	553	544	740
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	101	309	3	155								
Volume Left	10	0	3	79								
Volume Right	4	62	0	74								
cSH	1132	1517	338	629								
Volume to Capacity	0.01	0.00	0.01	0.25								
Queue Length 95th (ft)	1	0	1	24								
Control Delay (s)	0.9	0.0	15.7	12.6								
Lane LOS	A		C	B								
Approach Delay (s)	0.9	0.0	15.7	12.6								
Approach LOS			C	B								
<b>Intersection Summary</b>												
Average Delay			3.7									
Intersection Capacity Utilization		25.8%		ICU Level of Service					A			
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑			↔		↑	↑	↑
Volume (vph)	358	260	0	0	281	38	0	0	1	22	0	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0			4.0		4.0	4.0
Lane Util. Factor	1.00	0.95				0.95			1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00				1.00			0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00				1.00			1.00		1.00	1.00
Fr <sub>t</sub>	1.00	1.00				0.98			0.86		1.00	0.85
Flt Protected	0.95	1.00				1.00			1.00		0.95	1.00
Satd. Flow (prot)	1671	3505				3442			1623		1804	1491
Flt Permitted	0.95	1.00				1.00			1.00		1.00	1.00
Satd. Flow (perm)	1671	3505				3442			1623		1899	1491
Peak-hour factor, PHF	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Adj. Flow (vph)	597	433	0	0	468	63	0	0	2	37	0	480
RTOR Reduction (vph)	0	0	0	0	12	0	0	2	0	0	0	78
Lane Group Flow (vph)	597	433	0	0	519	0	0	0	0	0	37	402
Confl. Peds. (#/hr)						4			1	1		4
Heavy Vehicles (%)	8%	3%	0%	0%	3%	3%	0%	0%	0%	0%	0%	8%
Turn Type	Prot			Prot			Perm			Perm		pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases							2			6		6
Actuated Green, G (s)	17.8	34.0			12.2			2.6			2.6	20.4
Effective Green, g (s)	17.8	34.0			12.2			2.6			2.6	20.4
Actuated g/C Ratio	0.40	0.76			0.27			0.06			0.06	0.46
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	667	2672			942			95			111	816
v/s Ratio Prot	c0.36	0.12			c0.15			0.00				c0.20
v/s Ratio Perm											0.02	0.07
v/c Ratio	0.90	0.16			0.55			0.00			0.33	0.49
Uniform Delay, d1	12.5	1.4			13.9			19.8			20.2	8.5
Progression Factor	1.00	1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2	14.5	0.0			0.7			0.0			1.8	0.5
Delay (s)	27.0	1.5			14.6			19.8			21.9	8.9
Level of Service	C	A			B			B			C	A
Approach Delay (s)		16.3			14.6			19.8			9.9	
Approach LOS		B			B			B			A	

#### Intersection Summary

HCM Average Control Delay	14.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	44.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑↓		↑	↑		↑	↑	
Volume (vph)	8	168	174	128	228	6	111	9	85	20	35	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00		1.00	0.86		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1881	1531	1805	3525		1735	1613		1805	1750	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.69	1.00		0.67	1.00	
Satd. Flow (perm)	1805	1881	1531	1805	3525		1264	1613		1273	1750	
Peak-hour factor, PHF	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Adj. Flow (vph)	12	243	252	186	330	9	161	13	123	29	51	49
RTOR Reduction (vph)	0	0	172	0	2	0	0	94	0	0	37	0
Lane Group Flow (vph)	12	243	80	186	337	0	161	42	0	29	63	0
Confl. Peds. (#/hr)				4	4			1				1
Confl. Bikes (#/hr)							1					
Heavy Vehicles (%)	0%	1%	3%	0%	2%	0%	4%	0%	2%	0%	0%	0%
Turn Type	Prot		Perm	Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	1.0	16.1	16.1	10.7	25.8		12.0	12.0		12.0	12.0	
Effective Green, g (s)	1.0	16.1	16.1	10.7	25.8		12.0	12.0		12.0	12.0	
Actuated g/C Ratio	0.02	0.32	0.32	0.21	0.51		0.24	0.24		0.24	0.24	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	36	596	485	380	1790		299	381		301	413	
v/s Ratio Prot	0.01	c0.13		c0.10	0.10			0.03			0.04	
v/s Ratio Perm			0.05				c0.13			0.02		
v/c Ratio	0.33	0.41	0.16	0.49	0.19		0.54	0.11		0.10	0.15	
Uniform Delay, d1	24.6	13.6	12.5	17.6	6.8		17.0	15.2		15.2	15.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.4	0.5	0.2	1.0	0.1		1.9	0.1		0.1	0.2	
Delay (s)	30.0	14.1	12.7	18.6	6.9		18.8	15.3		15.3	15.5	
Level of Service	C	B	B	B	A		B	B		B	B	
Approach Delay (s)		13.7			11.0			17.2			15.5	
Approach LOS		B			B			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay		13.6			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.47										
Actuated Cycle Length (s)		50.8			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		40.7%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	4	67	64	112	210	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	4	75	72	126	236	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				358		
pX, platoon unblocked						
vC, conflicting volume	507	238	239			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	507	238	239			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	91	95			
cM capacity (veh/h)	500	806	1339			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	80	72	126	239		
Volume Left	4	72	0	0		
Volume Right	75	0	0	3		
cSH	779	1339	1700	1700		
Volume to Capacity	0.10	0.05	0.07	0.14		
Queue Length 95th (ft)	9	4	0	0		
Control Delay (s)	10.1	7.8	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	10.1	2.9		0.0		
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			2.7			
Intersection Capacity Utilization		29.1%		ICU Level of Service		A
Analysis Period (min)		15				



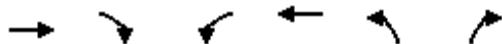
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	2	3	4	5	6	7	8	9	10	11	12
Volume (vph)	56	41	22	177	140	65	59	278	86	29	214	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	0.95		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1679		1786	1765		1805	1827	1546	1751	1845	1509
Flt Permitted	0.58	1.00		0.51	1.00		0.39	1.00	1.00	0.42	1.00	1.00
Satd. Flow (perm)	1061	1679		968	1765		741	1827	1546	771	1845	1509
Peak-hour factor, PHF	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Adj. Flow (vph)	80	59	31	253	200	93	84	397	123	41	306	110
RTOR Reduction (vph)	0	25	0	0	24	0	0	0	75	0	0	75
Lane Group Flow (vph)	80	65	0	253	269	0	84	397	48	41	306	35
Confl. Peds. (#/hr)				1	1				3	3		
Heavy Vehicles (%)	4%	0%	19%	1%	0%	8%	0%	4%	2%	3%	3%	7%
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	14.2	11.2		22.8	15.8		25.1	20.7	20.7	19.9	18.1	18.1
Effective Green, g (s)	14.2	11.2		22.8	15.8		25.1	20.7	20.7	19.9	18.1	18.1
Actuated g/C Ratio	0.25	0.20		0.40	0.28		0.44	0.36	0.36	0.35	0.32	0.32
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	298	328		494	487		406	660	559	299	583	477
v/s Ratio Prot	0.01	0.04		c0.07	c0.15		c0.02	c0.22		0.00	0.17	
v/s Ratio Perm	0.05			0.14			0.07		0.03	0.04		0.02
v/c Ratio	0.27	0.20		0.51	0.55		0.21	0.60	0.09	0.14	0.52	0.07
Uniform Delay, d1	17.0	19.3		12.3	17.7		9.9	14.9	12.1	12.6	16.1	13.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.3		0.9	1.4		0.3	1.6	0.1	0.2	0.9	0.1
Delay (s)	17.5	19.6		13.2	19.1		10.2	16.5	12.1	12.8	16.9	13.8
Level of Service	B	B		B	B		B	B	B	B	B	B
Approach Delay (s)		18.6			16.3			14.7			15.8	
Approach LOS		B			B			B			B	

#### Intersection Summary

HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	57.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗
Volume (vph)	368	50	126	389	58	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1597	1482	1743	1509	1504	1900
Flt Permitted	0.95	1.00	1.00	1.00	0.48	1.00
Satd. Flow (perm)	1597	1482	1743	1509	764	1900
Peak-hour factor, PHF	0.72	0.72	0.72	0.72	0.72	0.72
Adj. Flow (vph)	511	69	175	540	81	304
RTOR Reduction (vph)	0	22	0	410	0	0
Lane Group Flow (vph)	511	47	175	130	81	304
Heavy Vehicles (%)	13%	9%	9%	7%	20%	0%
Turn Type	Perm		Perm	pm+pt		
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	26.7	26.7	14.9	14.9	26.1	26.1
Effective Green, g (s)	26.7	26.7	14.9	14.9	26.1	26.1
Actuated g/C Ratio	0.43	0.43	0.24	0.24	0.42	0.42
Clearance Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	690	640	420	364	397	802
v/s Ratio Prot	c0.32		0.10		0.02	c0.16
v/s Ratio Perm		0.03		0.09	0.07	
v/c Ratio	0.74	0.07	0.42	0.36	0.20	0.38
Uniform Delay, d1	14.7	10.3	19.8	19.5	11.1	12.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.3	0.0	0.7	0.6	0.3	0.3
Delay (s)	18.9	10.3	20.5	20.1	11.4	12.6
Level of Service	B	B	C	C	B	B
Approach Delay (s)	17.9		20.2		12.3	
Approach LOS	B		C		B	
Intersection Summary						
HCM Average Control Delay		17.6	HCM Level of Service		B	
HCM Volume to Capacity ratio		0.56				
Actuated Cycle Length (s)		61.8	Sum of lost time (s)		9.0	
Intersection Capacity Utilization		42.0%	ICU Level of Service		A	
Analysis Period (min)		15				
c Critical Lane Group						



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Volume (veh/h)	159	148	10	98	152	11
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	175	163	11	108	167	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		337		386	256	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		337		386	256	
tC, single (s)		4.1		6.4	6.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	3.3	
p0 queue free %		99		73	98	
cM capacity (veh/h)		1233		612	787	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	337	119	179			
Volume Left	0	11	167			
Volume Right	163	0	12			
cSH	1700	1233	621			
Volume to Capacity	0.20	0.01	0.29			
Queue Length 95th (ft)	0	1	30			
Control Delay (s)	0.0	0.8	13.1			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.8	13.1			
Approach LOS			B			
Intersection Summary						
Average Delay		3.9				
Intersection Capacity Utilization		33.2%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Volume (vph)	204	112	692	241	149	409
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8		5.4		5.7	5.4
Lane Util. Factor	1.00		1.00		1.00	1.00
Frpb, ped/bikes	0.99		0.99		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Fr <sub>t</sub>	0.95		0.97		1.00	1.00
Fl <sub>t</sub> Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1715		1799		1752	1881
Fl <sub>t</sub> Permitted	0.97		1.00		0.07	1.00
Satd. Flow (perm)	1715		1799		120	1881
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	204	112	692	241	149	409
RTOR Reduction (vph)	14	0	6	0	0	0
Lane Group Flow (vph)	302	0	927	0	149	409
Confl. Peds. (#/hr)			2		8	8
Heavy Vehicles (%)	2%	0%	1%	2%	3%	1%
Turn Type					pm+pt	
Protected Phases	6		4		3	8
Permitted Phases					8	
Actuated Green, G (s)	21.4		55.6		69.6	69.6
Effective Green, g (s)	21.4		55.6		69.6	69.6
Actuated g/C Ratio	0.21		0.54		0.68	0.68
Clearance Time (s)	5.8		5.4		5.7	5.4
Vehicle Extension (s)	1.0		1.0		1.0	1.0
Lane Grp Cap (vph)	359		979		214	1281
v/s Ratio Prot	c0.18		c0.52		c0.06	0.22
v/s Ratio Perm					0.42	
v/c Ratio	0.84		0.95		0.70	0.32
Uniform Delay, d1	38.8		21.9		25.6	6.6
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	15.5		17.0		7.7	0.1
Delay (s)	54.2		38.9		33.3	6.7
Level of Service	D		D		C	A
Approach Delay (s)	54.2		38.9			13.8
Approach LOS	D		D			B
<b>Intersection Summary</b>						
HCM Average Control Delay		33.8		HCM Level of Service		C
HCM Volume to Capacity ratio		0.90				
Actuated Cycle Length (s)		102.2		Sum of lost time (s)		16.9
Intersection Capacity Utilization		91.9%		ICU Level of Service		F
Analysis Period (min)		15				
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	357	24	41	223	2	45	5	60	1	4	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00				1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00				1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00				1.00	1.00		1.00	
Fr <sub>t</sub>	1.00	0.85	1.00	1.00				1.00	0.85		0.98	
Fl <sub>t</sub> Protected	1.00	1.00	0.95	1.00				0.96	1.00		0.99	
Satd. Flow (prot)	1862	1615	1770	1879				1819	1548		1850	
Fl <sub>t</sub> Permitted	1.00	1.00	0.95	1.00				0.74	1.00		0.95	
Satd. Flow (perm)	1856	1615	1770	1879				1413	1548		1779	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	6	406	27	47	253	2	51	6	68	1	5	1
RTOR Reduction (vph)	0	0	13	0	0	0	0	0	59	0	1	0
Lane Group Flow (vph)	0	412	14	47	255	0	0	57	9	0	6	0
Confl. Peds. (#/hr)	2					2			3	3		
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	2%	0%	2%	1%	0%	0%	0%	2%	0%	0%	0%
Turn Type	Perm		Perm	Prot			Perm		Perm	Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4				2		2	6		
Actuated Green, G (s)	22.3	22.3	2.6	28.9				5.9	5.9		5.9	
Effective Green, g (s)	22.3	22.3	2.6	28.9				5.9	5.9		5.9	
Actuated g/C Ratio	0.52	0.52	0.06	0.68				0.14	0.14		0.14	
Clearance Time (s)	4.0	4.0	4.0	4.0				4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0				3.0	3.0		3.0	
Lane Grp Cap (vph)	967	841	108	1269			195	213		245		
v/s Ratio Prot		c0.03	0.14									
v/s Ratio Perm	c0.22	0.01					c0.04	0.01		0.00		
v/c Ratio	0.43	0.02	0.44	0.20			0.29	0.04		0.03		
Uniform Delay, d1	6.3	5.0	19.4	2.6			16.6	16.0		16.0		
Progression Factor	1.00	1.00	1.00	1.00			1.00	1.00		1.00		
Incremental Delay, d2	0.3	0.0	2.8	0.1			0.8	0.1		0.0		
Delay (s)	6.6	5.0	22.2	2.7			17.4	16.1		16.0		
Level of Service	A	A	C	A			B	B		B		
Approach Delay (s)	6.5			5.7			16.7			16.0		
Approach LOS	A			A			B			B		
<b>Intersection Summary</b>												
HCM Average Control Delay		7.8		HCM Level of Service				A				
HCM Volume to Capacity ratio		0.40										
Actuated Cycle Length (s)		42.8		Sum of lost time (s)				12.0				
Intersection Capacity Utilization		51.5%		ICU Level of Service				A				
Analysis Period (min)		15										
c Critical Lane Group												



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	97	278	148	52	101	64
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	111	320	170	60	116	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	230			743	200	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	230			743	200	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	92			67	91	
cM capacity (veh/h)	1350			351	846	
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	431	230	116	74		
Volume Left	111	0	116	0		
Volume Right	0	60	0	74		
cSH	1350	1700	351	846		
Volume to Capacity	0.08	0.14	0.33	0.09		
Queue Length 95th (ft)	7	0	35	7		
Control Delay (s)	2.6	0.0	20.2	9.7		
Lane LOS	A		C	A		
Approach Delay (s)	2.6	0.0	16.1			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			4.9			
Intersection Capacity Utilization		46.5%		ICU Level of Service		A
Analysis Period (min)			15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	304	54	2	164	0	34	0	3	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	1	349	62	2	189	0	39	0	3	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	189			411			576	576	380	579	607	189
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	189			411			576	576	380	579	607	189
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			91	100	99	100	100	100
cM capacity (veh/h)	1398			1158			431	430	671	426	412	859
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	413	191	43	0								
Volume Left	1	2	39	0								
Volume Right	62	0	3	0								
cSH	1398	1158	443	1700								
Volume to Capacity	0.00	0.00	0.10	0.00								
Queue Length 95th (ft)	0	0	8	0								
Control Delay (s)	0.0	0.1	14.0	0.0								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.0	0.1	14.0	0.0								
Approach LOS			B	A								
<b>Intersection Summary</b>												
Average Delay			1.0									
Intersection Capacity Utilization		29.9%		ICU Level of Service					A			
Analysis Period (min)		15										



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	79	208	3	2	137	70	3	0	0	89	0	38
Sign Control		Free				Free			Stop			Stop
Grade		0%				0%			0%			0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	84	221	3	2	146	74	3	0	0	95	0	40
Pedestrians						1						
Lane Width (ft)						12.0						
Walking Speed (ft/s)						4.0						
Percent Blockage						0						
Right turn flare (veh)												
Median type			None			None						
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	220			224			619	615	224	579	580	183
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	220			224			619	615	224	579	580	183
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.4
p0 queue free %	94			100			99	100	100	77	100	95
cM capacity (veh/h)	1331			1356			366	383	820	403	401	844
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	309	222	3	135								
Volume Left	84	2	3	95								
Volume Right	3	74	0	40								
cSH	1331	1356	366	478								
Volume to Capacity	0.06	0.00	0.01	0.28								
Queue Length 95th (ft)	5	0	1	29								
Control Delay (s)	2.6	0.1	14.9	15.5								
Lane LOS	A	A	B	C								
Approach Delay (s)	2.6	0.1	14.9	15.5								
Approach LOS			B	C								
<b>Intersection Summary</b>												
Average Delay			4.4									
Intersection Capacity Utilization		43.6%			ICU Level of Service				A			
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↓		↑	↑↓			↔			↑	↑
Volume (vph)	69	582	0	1	455	38	0	0	0	39	0	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0						4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95						1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00						1.00	1.00
Fr <sub>t</sub>	1.00	1.00		1.00	0.99						1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00						0.95	1.00
Satd. Flow (prot)	1805	3610		1804	3492						1752	1615
Flt Permitted	0.95	1.00		0.95	1.00						1.00	1.00
Satd. Flow (perm)	1805	3610		1804	3492						1845	1615
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	80	677	0	1	529	44	0	0	0	45	0	50
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	0	40
Lane Group Flow (vph)	80	677	0	1	568	0	0	0	0	0	45	10
Confl. Peds. (#/hr)			3	3								
Confl. Bikes (#/hr)			1			1				1		
Heavy Vehicles (%)	0%	0%	0%	0%	2%	3%	0%	0%	0%	3%	0%	0%
Turn Type	Prot			Prot			Perm			Perm		pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases							2			6		6
Actuated Green, G (s)	6.1	27.1		0.9	21.9						2.8	8.9
Effective Green, g (s)	6.1	27.1		0.9	21.9						2.8	8.9
Actuated g/C Ratio	0.14	0.63		0.02	0.51						0.07	0.21
Clearance Time (s)	4.0	4.0		4.0	4.0						4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)	257	2286		38	1787						121	487
v/s Ratio Prot	c0.04	c0.19		0.00	0.16							0.00
v/s Ratio Perm											c0.02	0.00
v/c Ratio	0.31	0.30		0.03	0.32						0.37	0.02
Uniform Delay, d1	16.5	3.5		20.5	6.1						19.2	13.5
Progression Factor	1.00	1.00		1.00	1.00						1.00	1.00
Incremental Delay, d2	0.7	0.1		0.3	0.1						1.9	0.0
Delay (s)	17.2	3.6		20.8	6.2						21.1	13.5
Level of Service	B	A		C	A						C	B
Approach Delay (s)		5.0			6.2			0.0			17.1	
Approach LOS		A			A			A			B	

#### Intersection Summary

HCM Average Control Delay	6.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	42.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘	↗ ↙	↑ ↗	↑ ↗ ↘	7	199	26	89	10	15	22
Volume (vph)	38	378	221	36	252	7	199	26	89	10	15	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00		1.00	0.88		1.00	0.91	
Fl <sub>t</sub> Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1900	1599	1805	3559		1786	1680		1805	1714	
Fl <sub>t</sub> Permitted	0.95	1.00	1.00	0.95	1.00		0.73	1.00		0.68	1.00	
Satd. Flow (perm)	1805	1900	1599	1805	3559		1376	1680		1293	1714	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	39	390	228	37	260	7	205	27	92	10	15	23
RTOR Reduction (vph)	0	0	134	0	2	0	0	65	0	0	16	0
Lane Group Flow (vph)	39	390	94	37	265	0	205	54	0	10	22	0
Confl. Peds. (#/hr)	2					2	2					2
Heavy Vehicles (%)	0%	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot		Perm	Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	2.2	19.7	19.7	2.3	19.8		13.8	13.8		13.8	13.8	
Effective Green, g (s)	2.2	19.7	19.7	2.3	19.8		13.8	13.8		13.8	13.8	
Actuated g/C Ratio	0.05	0.41	0.41	0.05	0.41		0.29	0.29		0.29	0.29	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	83	783	659	87	1474		397	485		373	495	
v/s Ratio Prot	c0.02	c0.21		0.02	0.07			0.03			0.01	
v/s Ratio Perm			0.06				c0.15			0.01		
v/c Ratio	0.47	0.50	0.14	0.43	0.18		0.52	0.11		0.03	0.04	
Uniform Delay, d <sub>1</sub>	22.2	10.4	8.8	22.1	8.9		14.2	12.5		12.2	12.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d <sub>2</sub>	4.2	0.5	0.1	3.3	0.1		1.1	0.1		0.0	0.0	
Delay (s)	26.4	10.9	8.9	25.4	8.9		15.3	12.6		12.2	12.3	
Level of Service	C	B	A	C	A		B	B		B	B	
Approach Delay (s)		11.1			10.9			14.3			12.3	
Approach LOS		B			B			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			11.9			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			47.8			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			50.9%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	69	71	267	178	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	3	79	82	307	205	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				358		
pX, platoon unblocked	0.90					
vC, conflicting volume	678	207	210			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	586	207	210			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	91	94			
cM capacity (veh/h)	403	838	1360			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	83	82	307	210		
Volume Left	3	82	0	0		
Volume Right	79	0	0	6		
cSH	802	1360	1700	1700		
Volume to Capacity	0.10	0.06	0.18	0.12		
Queue Length 95th (ft)	9	5	0	0		
Control Delay (s)	10.0	7.8	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	10.0	1.6		0.0		
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			2.2			
Intersection Capacity Utilization		28.0%		ICU Level of Service		A
Analysis Period (min)		15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑	↑	↑	↑	↑
Volume (vph)	81	194	82	99	125	45	62	252	153	76	325	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.96	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1802		1735	1791		1805	1881	1557	1799	1881	1579
Flt Permitted	0.58	1.00		0.38	1.00		0.38	1.00	1.00	0.42	1.00	1.00
Satd. Flow (perm)	1105	1802		689	1791		713	1881	1557	790	1881	1579
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	95	228	96	116	147	53	73	296	180	89	382	64
RTOR Reduction (vph)	0	22	0	0	18	0	0	0	126	0	0	43
Lane Group Flow (vph)	95	302	0	116	182	0	73	296	54	89	382	21
Confl. Peds. (#/hr)			1	1					12	12		
Confl. Bikes (#/hr)			3			1			1			2
Heavy Vehicles (%)	0%	0%	0%	4%	1%	2%	0%	1%	0%	0%	1%	0%
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	20.1	15.8		20.1	15.8		20.5	17.5	17.5	23.1	18.8	18.8
Effective Green, g (s)	20.1	15.8		20.1	15.8		20.5	17.5	17.5	23.1	18.8	18.8
Actuated g/C Ratio	0.35	0.27		0.35	0.27		0.35	0.30	0.30	0.40	0.32	0.32
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	436	492		317	489		309	569	471	390	611	513
v/s Ratio Prot	0.02	c0.17		c0.03	0.10		0.01	0.16		c0.02	c0.20	
v/s Ratio Perm	0.06			0.10			0.07		0.03	0.07		0.01
v/c Ratio	0.22	0.61		0.37	0.37		0.24	0.52	0.12	0.23	0.63	0.04
Uniform Delay, d1	13.0	18.4		13.5	17.0		12.8	16.7	14.6	11.3	16.6	13.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	2.3		0.7	0.5		0.4	0.9	0.1	0.3	2.0	0.0
Delay (s)	13.3	20.7		14.2	17.5		13.2	17.6	14.7	11.6	18.6	13.4
Level of Service	B	C		B	B		B	B	B	B	B	B
Approach Delay (s)		19.0			16.3			16.1			16.8	
Approach LOS		B			B			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay		17.0		HCM Level of Service					B			
HCM Volume to Capacity ratio		0.52										
Actuated Cycle Length (s)		57.9		Sum of lost time (s)					12.0			
Intersection Capacity Utilization		54.9%		ICU Level of Service					A			
Analysis Period (min)		15										
c Critical Lane Group												



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (vph)	256	53	285	292	68	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	0.85	1.00	0.85	1.00	1.00
Fl <sub>t</sub> Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	1615	1845	1569	1805	1881
Fl <sub>t</sub> Permitted	0.95	1.00	1.00	1.00	0.35	1.00
Satd. Flow (perm)	1787	1615	1845	1569	657	1881
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	316	65	352	360	84	221
RTOR Reduction (vph)	0	40	0	238	0	0
Lane Group Flow (vph)	316	25	352	122	84	221
Confl. Bikes (#/hr)				8		
Heavy Vehicles (%)	1%	0%	3%	0%	0%	1%
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	16.5	16.5	18.4	18.4	28.7	28.7
Effective Green, g (s)	16.5	16.5	18.4	18.4	28.7	28.7
Actuated g/C Ratio	0.30	0.30	0.34	0.34	0.53	0.53
Clearance Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	544	492	626	533	460	996
v/s Ratio Prot	c0.18		c0.19		0.02	c0.12
v/s Ratio Perm		0.02		0.08	0.08	
v/c Ratio	0.58	0.05	0.56	0.23	0.18	0.22
Uniform Delay, d1	15.9	13.3	14.6	12.8	7.1	6.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.0	1.2	0.2	0.2	0.1
Delay (s)	17.5	13.4	15.8	13.0	7.2	6.9
Level of Service	B	B	B	B	A	A
Approach Delay (s)	16.8		14.4		7.0	
Approach LOS	B		B		A	
Intersection Summary						
HCM Average Control Delay		13.4		HCM Level of Service		B
HCM Volume to Capacity ratio		0.54				
Actuated Cycle Length (s)		54.2		Sum of lost time (s)		14.0
Intersection Capacity Utilization		44.6%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

## Appendix H 2018 Total Traffic Conditions Worksheets



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑ ↗			↖ ↘	↖ ↗	
Volume (veh/h)	53	188	14	183	182	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	62	219	16	213	212	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		280		416	171	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		280		416	171	
tC, single (s)		4.1		6.4	7.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	4.2	
p0 queue free %		99		64	99	
cM capacity (veh/h)		1294		582	672	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	280	229	216			
Volume Left	0	16	212			
Volume Right	219	0	5			
cSH	1700	1294	583			
Volume to Capacity	0.16	0.01	0.37			
Queue Length 95th (ft)	0	1	43			
Control Delay (s)	0.0	0.7	14.8			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.7	14.8			
Approach LOS			B			
Intersection Summary						
Average Delay		4.6				
Intersection Capacity Utilization	38.2%		ICU Level of Service		A	
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	218	247	307	84	556	358
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8		5.4		5.7	5.4
Lane Util. Factor	1.00		1.00		1.00	1.00
Fr <sub>t</sub>	0.93		0.97		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1612		1643		1805	1881
Flt Permitted	0.98		1.00		0.19	1.00
Satd. Flow (perm)	1612		1643		358	1881
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	218	247	307	84	556	358
RTOR Reduction (vph)	25	0	8	0	0	0
Lane Group Flow (vph)	440	0	383	0	556	358
Heavy Vehicles (%)	0%	13%	14%	6%	0%	1%
Turn Type				pm+pt		
Protected Phases	6		4		3	8
Permitted Phases					8	
Actuated Green, G (s)	35.8		28.1		58.6	58.6
Effective Green, g (s)	35.8		28.1		58.6	58.6
Actuated g/C Ratio	0.34		0.27		0.55	0.55
Clearance Time (s)	5.8		5.4		5.7	5.4
Vehicle Extension (s)	1.0		1.0		1.0	1.0
Lane Grp Cap (vph)	546		437		538	1044
v/s Ratio Prot	c0.27		0.23		c0.24	0.19
v/s Ratio Perm					c0.33	
v/c Ratio	0.81		0.88		1.03	0.34
Uniform Delay, d1	31.7		37.1		26.5	12.9
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	8.0		17.1		47.7	0.1
Delay (s)	39.7		54.2		74.1	13.0
Level of Service	D		D		E	B
Approach Delay (s)	39.7		54.2			50.2
Approach LOS	D		D			D
Intersection Summary						
HCM Average Control Delay		48.3		HCM Level of Service		D
HCM Volume to Capacity ratio		0.92				
Actuated Cycle Length (s)		105.6		Sum of lost time (s)		11.5
Intersection Capacity Utilization		93.1%		ICU Level of Service		F
Analysis Period (min)		15				
c Critical Lane Group						



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	133	279	126	308	1	84	2	37	2	5	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0			4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00			1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00			1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00			1.00	1.00			1.00	
Fr <sub>t</sub>	1.00	0.85	1.00	1.00			1.00	0.85			0.97	
Fl <sub>t</sub> Protected	1.00	1.00	0.95	1.00			0.95	1.00			0.99	
Satd. Flow (prot)	1760	1615	1671	1818			1636	1417			1486	
Fl <sub>t</sub> Permitted	1.00	1.00	0.95	1.00			0.72	1.00			0.94	
Satd. Flow (perm)	1754	1615	1671	1818			1237	1417			1409	
Peak-hour factor, PHF	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Adj. Flow (vph)	2	202	423	191	467	2	127	3	56	3	8	3
RTOR Reduction (vph)	0	0	265	0	0	0	0	0	46	0	2	0
Lane Group Flow (vph)	0	204	158	191	469	0	0	130	10	0	12	0
Confl. Peds. (#/hr)	1				1							
Heavy Vehicles (%)	100%	7%	0%	8%	4%	100%	11%	0%	14%	0%	40%	0%
Turn Type	Perm		Perm	Prot			Perm		Perm	Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4			2			2	6		
Actuated Green, G (s)	17.7	17.7	8.9	30.6			8.8	8.8			8.8	
Effective Green, g (s)	17.7	17.7	8.9	30.6			8.8	8.8			8.8	
Actuated g/C Ratio	0.37	0.37	0.19	0.65			0.19	0.19			0.19	
Clearance Time (s)	4.0	4.0	4.0	4.0			4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	655	603	314	1174			230	263			262	
v/s Ratio Prot			c0.11	c0.26								
v/s Ratio Perm	0.12	0.10					c0.11	0.01			0.01	
v/c Ratio	0.31	0.26	0.61	0.40			0.57	0.04			0.04	
Uniform Delay, d1	10.5	10.3	17.7	4.0			17.6	15.8			15.8	
Progression Factor	1.00	1.00	1.00	1.00			1.00	1.00			1.00	
Incremental Delay, d2	0.3	0.2	3.3	0.2			3.2	0.1			0.1	
Delay (s)	10.8	10.5	21.0	4.2			20.7	15.9			15.9	
Level of Service	B	B	C	A			C	B			B	
Approach Delay (s)	10.6			9.1			19.3				15.9	
Approach LOS	B			A			B				B	

#### Intersection Summary

HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	47.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑	↑	↑		↑	↑
Volume (veh/h)	88	69	213	109	52	251
Sign Control	Free	Free			Stop	
Grade	0%	0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	99	78	239	122	58	282
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None	None				
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	362			576	301	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	362			576	301	
tC, single (s)	4.2			6.5	6.2	
tC, 2 stage (s)						
tF (s)	2.3			3.6	3.3	
p0 queue free %	92			86	61	
cM capacity (veh/h)	1164			429	732	
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	99	78	362	58	282	
Volume Left	99	0	0	58	0	
Volume Right	0	0	122	0	282	
cSH	1164	1700	1700	429	732	
Volume to Capacity	0.08	0.05	0.21	0.14	0.39	
Queue Length 95th (ft)	7	0	0	12	46	
Control Delay (s)	8.4	0.0	0.0	14.7	13.0	
Lane LOS	A			B	B	
Approach Delay (s)	4.7		0.0	13.3		
Approach LOS				B		
<b>Intersection Summary</b>						
Average Delay			6.1			
Intersection Capacity Utilization		40.1%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	65	54	4	237	0	68	1	3	0	2	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	71	59	4	258	0	74	1	3	0	2	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	258			129			374	368	100	372	398	258
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	258			129			374	368	100	372	398	258
tC, single (s)	4.1			4.3			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			87	100	100	100	100	99
cM capacity (veh/h)	1319			1326			576	562	961	584	541	786
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	130	262	78	7								
Volume Left	1	4	74	0								
Volume Right	59	0	3	4								
cSH	1319	1326	586	683								
Volume to Capacity	0.00	0.00	0.13	0.01								
Queue Length 95th (ft)	0	0	11	1								
Control Delay (s)	0.1	0.2	12.1	10.3								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	12.1	10.3								
Approach LOS			B	B								
<b>Intersection Summary</b>												
Average Delay			2.2									
Intersection Capacity Utilization		32.4%		ICU Level of Service					A			
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	69	3	0	191	48	2	0	0	61	1	57
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	10	90	4	0	248	62	3	0	0	79	1	74
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	310			94			466	423	92	392	394	279
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	310			94			466	423	92	392	394	279
tC, single (s)	4.3			4.1			8.1	6.5	6.2	7.2	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			4.4	4.0	3.3	3.6	4.0	3.4
p0 queue free %	99			100			99	100	100	86	100	90
cM capacity (veh/h)	1131			1513			335	521	971	550	541	739
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	104	310	3	155								
Volume Left	10	0	3	79								
Volume Right	4	62	0	74								
cSH	1131	1513	335	626								
Volume to Capacity	0.01	0.00	0.01	0.25								
Queue Length 95th (ft)	1	0	1	24								
Control Delay (s)	0.9	0.0	15.8	12.6								
Lane LOS	A		C	B								
Approach Delay (s)	0.9	0.0	15.8	12.6								
Approach LOS			C	B								
<b>Intersection Summary</b>												
Average Delay			3.6									
Intersection Capacity Utilization		25.8%		ICU Level of Service					A			
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↓		↑	↑↓			↔		↑	↑	↑
Volume (vph)	362	260	0	0	281	43	0	0	1	36	0	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95			0.95			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00			0.99			1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	1.00
Frt	1.00	1.00			0.98			0.86			1.00	0.85
Flt Protected	0.95	1.00			1.00			1.00			0.95	1.00
Satd. Flow (prot)	1671	3505			3435			1623			1804	1488
Flt Permitted	0.95	1.00			1.00			1.00			0.87	1.00
Satd. Flow (perm)	1671	3505			3435			1623			1651	1488
Peak-hour factor, PHF	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Adj. Flow (vph)	603	433	0	0	468	72	0	0	2	60	0	500
RTOR Reduction (vph)	0	0	0	0	14	0	0	2	0	0	0	76
Lane Group Flow (vph)	603	433	0	0	526	0	0	0	0	0	60	424
Confl. Peds. (#/hr)						4			1	1		4
Heavy Vehicles (%)	8%	3%	0%	0%	3%	3%	0%	0%	0%	0%	0%	8%
Turn Type	Prot			Prot			Perm			Perm		pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases							2			6		6
Actuated Green, G (s)	17.9	35.0			13.1			4.6			4.6	22.5
Effective Green, g (s)	17.9	35.0			13.1			4.6			4.6	22.5
Actuated g/C Ratio	0.38	0.74			0.28			0.10			0.10	0.47
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	628	2577			945			157			160	828
v/s Ratio Prot	c0.36	0.12			c0.15			0.00				c0.19
v/s Ratio Perm											0.04	0.09
v/c Ratio	0.96	0.17			0.56			0.00			0.38	0.51
Uniform Delay, d1	14.5	1.9			14.8			19.4			20.2	8.7
Progression Factor	1.00	1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2	26.2	0.0			0.7			0.0			1.5	0.5
Delay (s)	40.8	1.9			15.5			19.4			21.6	9.3
Level of Service	D	A			B			B			C	A
Approach Delay (s)		24.5			15.5			19.4			10.6	
Approach LOS		C			B			B			B	

#### Intersection Summary

HCM Average Control Delay	18.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	47.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑↑		↑	↑		↑	↑	
Volume (vph)	8	170	186	128	229	6	115	9	85	20	35	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00		1.00	0.86		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1881	1531	1805	3525		1735	1613		1805	1750	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.69	1.00		0.67	1.00	
Satd. Flow (perm)	1805	1881	1531	1805	3525		1264	1613		1273	1750	
Peak-hour factor, PHF	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Adj. Flow (vph)	12	246	270	186	332	9	167	13	123	29	51	49
RTOR Reduction (vph)	0	0	183	0	2	0	0	94	0	0	37	0
Lane Group Flow (vph)	12	246	87	186	339	0	167	42	0	29	63	0
Confl. Peds. (#/hr)			4	4			1					1
Confl. Bikes (#/hr)							1					
Heavy Vehicles (%)	0%	1%	3%	0%	2%	0%	4%	0%	2%	0%	0%	0%
Turn Type	Prot		Perm	Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	1.0	16.5	16.5	10.7	26.2		12.3	12.3		12.3	12.3	
Effective Green, g (s)	1.0	16.5	16.5	10.7	26.2		12.3	12.3		12.3	12.3	
Actuated g/C Ratio	0.02	0.32	0.32	0.21	0.51		0.24	0.24		0.24	0.24	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	35	603	491	375	1793		302	385		304	418	
v/s Ratio Prot	0.01	c0.13		c0.10	0.10			0.03			0.04	
v/s Ratio Perm			0.06				c0.13			0.02		
v/c Ratio	0.34	0.41	0.18	0.50	0.19		0.55	0.11		0.10	0.15	
Uniform Delay, d1	24.9	13.7	12.6	18.0	6.9		17.2	15.3		15.3	15.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.8	0.5	0.2	1.0	0.1		2.2	0.1		0.1	0.2	
Delay (s)	30.7	14.1	12.8	19.1	6.9		19.4	15.4		15.4	15.6	
Level of Service	C	B	B	B	A		B	B		B	B	
Approach Delay (s)		13.8			11.2			17.6			15.6	
Approach LOS		B			B			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay		13.8			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.48										
Actuated Cycle Length (s)		51.5			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		41.0%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	4	68	64	112	211	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	4	76	72	126	237	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				358		
pX, platoon unblocked						
vC, conflicting volume	508	239	240			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	508	239	240			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	91	95			
cM capacity (veh/h)	500	805	1338			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	81	72	126	240		
Volume Left	4	72	0	0		
Volume Right	76	0	0	3		
cSH	779	1338	1700	1700		
Volume to Capacity	0.10	0.05	0.07	0.14		
Queue Length 95th (ft)	9	4	0	0		
Control Delay (s)	10.2	7.8	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	10.2	2.9		0.0		
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			2.7			
Intersection Capacity Utilization		29.3%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑	↑	↑	↑	↑
Volume (vph)	58	41	22	177	140	65	59	280	86	29	226	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1679		1786	1765		1805	1827	1546	1751	1845	1509
Flt Permitted	0.53	1.00		0.54	1.00		0.38	1.00	1.00	0.41	1.00	1.00
Satd. Flow (perm)	962	1679		1019	1765		713	1827	1546	752	1845	1509
Peak-hour factor, PHF	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Adj. Flow (vph)	83	59	31	253	200	93	84	400	123	41	323	110
RTOR Reduction (vph)	0	25	0	0	25	0	0	0	75	0	0	75
Lane Group Flow (vph)	83	65	0	253	268	0	84	400	48	41	323	35
Confl. Peds. (#/hr)				1	1				3	3		
Heavy Vehicles (%)	4%	0%	19%	1%	0%	8%	0%	4%	2%	3%	3%	7%
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	15.7	11.4		22.3	14.7		25.1	20.8	20.8	20.3	18.4	18.4
Effective Green, g (s)	15.7	11.4		22.3	14.7		25.1	20.8	20.8	20.3	18.4	18.4
Actuated g/C Ratio	0.27	0.20		0.39	0.25		0.44	0.36	0.36	0.35	0.32	0.32
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	319	332		495	450		392	659	557	297	588	481
v/s Ratio Prot	0.02	0.04		c0.07	c0.15		c0.02	c0.22		0.00	0.18	
v/s Ratio Perm	0.05			0.13			0.08		0.03	0.04		0.02
v/c Ratio	0.26	0.20		0.51	0.60		0.21	0.61	0.09	0.14	0.55	0.07
Uniform Delay, d1	16.1	19.3		12.8	18.9		10.1	15.1	12.2	12.6	16.2	13.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.3		0.9	2.1		0.3	1.6	0.1	0.2	1.1	0.1
Delay (s)	16.5	19.6		13.7	21.0		10.4	16.7	12.2	12.8	17.3	13.8
Level of Service	B	B		B	C		B	B	B	B	B	B
Approach Delay (s)		18.1			17.6			14.9			16.1	
Approach LOS		B			B			B			B	

#### Intersection Summary

HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	57.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (vph)	368	50	126	389	58	221
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1597	1482	1743	1509	1504	1900
Flt Permitted	0.95	1.00	1.00	1.00	0.48	1.00
Satd. Flow (perm)	1597	1482	1743	1509	764	1900
Peak-hour factor, PHF	0.72	0.72	0.72	0.72	0.72	0.72
Adj. Flow (vph)	511	69	175	540	81	307
RTOR Reduction (vph)	0	22	0	410	0	0
Lane Group Flow (vph)	511	47	175	130	81	307
Heavy Vehicles (%)	13%	9%	9%	7%	20%	0%
Turn Type	Perm		Perm	pm+pt		
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	26.7	26.7	14.9	14.9	26.1	26.1
Effective Green, g (s)	26.7	26.7	14.9	14.9	26.1	26.1
Actuated g/C Ratio	0.43	0.43	0.24	0.24	0.42	0.42
Clearance Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	690	640	420	364	397	802
v/s Ratio Prot	c0.32		0.10		0.02	c0.16
v/s Ratio Perm		0.03		0.09	0.07	
v/c Ratio	0.74	0.07	0.42	0.36	0.20	0.38
Uniform Delay, d1	14.7	10.3	19.8	19.5	11.1	12.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.3	0.0	0.7	0.6	0.3	0.3
Delay (s)	18.9	10.3	20.5	20.1	11.4	12.6
Level of Service	B	B	C	C	B	B
Approach Delay (s)	17.9		20.2		12.3	
Approach LOS	B		C		B	
Intersection Summary						
HCM Average Control Delay		17.6	HCM Level of Service		B	
HCM Volume to Capacity ratio		0.56				
Actuated Cycle Length (s)		61.8	Sum of lost time (s)		9.0	
Intersection Capacity Utilization		42.0%	ICU Level of Service		A	
Analysis Period (min)		15				
c Critical Lane Group						



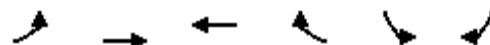
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑ ↗			↖ ↘	↖ ↗	
Volume (veh/h)	159	175	10	98	168	11
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	175	192	11	108	185	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		367		401	271	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		367		401	271	
tC, single (s)		4.1		6.4	6.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	3.3	
p0 queue free %		99		69	98	
cM capacity (veh/h)		1203		600	773	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	367	119	197			
Volume Left	0	11	185			
Volume Right	192	0	12			
cSH	1700	1203	608			
Volume to Capacity	0.22	0.01	0.32			
Queue Length 95th (ft)	0	1	35			
Control Delay (s)	0.0	0.8	13.7			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.8	13.7			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay		4.1				
Intersection Capacity Utilization		35.7%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Volume (vph)	220	128	692	261	176	409
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8		5.4		5.7	5.4
Lane Util. Factor	1.00		1.00		1.00	1.00
Frpb, ped/bikes	0.99		0.99		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Fr <sub>t</sub>	0.95		0.96		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1712		1793		1752	1881
Flt Permitted	0.97		1.00		0.07	1.00
Satd. Flow (perm)	1712		1793		120	1881
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	220	128	692	261	176	409
RTOR Reduction (vph)	15	0	8	0	0	0
Lane Group Flow (vph)	333	0	945	0	176	409
Confl. Peds. (#/hr)			2		8	8
Heavy Vehicles (%)	2%	0%	1%	2%	3%	1%
Turn Type					pm+pt	
Protected Phases	6		4		3	8
Permitted Phases					8	
Actuated Green, G (s)	24.6		55.6		71.5	71.5
Effective Green, g (s)	24.6		55.6		71.5	71.5
Actuated g/C Ratio	0.23		0.52		0.67	0.67
Clearance Time (s)	5.8		5.4		5.7	5.4
Vehicle Extension (s)	1.0		1.0		1.0	1.0
Lane Grp Cap (vph)	392		929		235	1253
v/s Ratio Prot	c0.19		c0.53		c0.07	0.22
v/s Ratio Perm					0.43	
v/c Ratio	0.85		1.02		0.75	0.33
Uniform Delay, d1	39.6		25.8		30.7	7.6
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	15.0		34.0		10.8	0.1
Delay (s)	54.6		59.8		41.6	7.7
Level of Service	D		E		D	A
Approach Delay (s)	54.6		59.8			17.9
Approach LOS	D		E			B
<b>Intersection Summary</b>						
HCM Average Control Delay		45.9		HCM Level of Service		D
HCM Volume to Capacity ratio		0.94				
Actuated Cycle Length (s)		107.3		Sum of lost time (s)		16.9
Intersection Capacity Utilization		96.5%		ICU Level of Service		F
Analysis Period (min)		15				
c Critical Lane Group						



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	404	24	63	255	2	45	5	103	1	4	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00				1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00				1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00				1.00	1.00		1.00	
Fr <sub>t</sub>	1.00	0.85	1.00	1.00				1.00	0.85		0.98	
Fl <sub>t</sub> Protected	1.00	1.00	0.95	1.00				0.96	1.00		0.99	
Satd. Flow (prot)	1862	1615	1770	1879				1819	1548		1850	
Fl <sub>t</sub> Permitted	1.00	1.00	0.95	1.00				0.74	1.00		0.95	
Satd. Flow (perm)	1856	1615	1770	1879				1413	1548		1778	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	6	459	27	72	290	2	51	6	117	1	5	1
RTOR Reduction (vph)	0	0	13	0	0	0	0	0	102	0	1	0
Lane Group Flow (vph)	0	465	14	72	292	0	0	57	15	0	6	0
Confl. Peds. (#/hr)	2					2			3	3		
Confl. Bikes (#/hr)							1					
Heavy Vehicles (%)	0%	2%	0%	2%	1%	0%	0%	0%	2%	0%	0%	0%
Turn Type	Perm		Perm	Prot			Perm		Perm	Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4				2		2	6		
Actuated Green, G (s)	22.8	22.8	4.5	31.3				5.9	5.9		5.9	
Effective Green, g (s)	22.8	22.8	4.5	31.3				5.9	5.9		5.9	
Actuated g/C Ratio	0.50	0.50	0.10	0.69				0.13	0.13		0.13	
Clearance Time (s)	4.0	4.0	4.0	4.0				4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0				3.0	3.0		3.0	
Lane Grp Cap (vph)	936	815	176	1301			184	202		232		
v/s Ratio Prot		c0.04	0.16									
v/s Ratio Perm	c0.25	0.01					c0.04	0.01		0.00		
v/c Ratio	0.50	0.02	0.41	0.22			0.31	0.08		0.03		
Uniform Delay, d1	7.4	5.6	19.1	2.5			17.8	17.3		17.1		
Progression Factor	1.00	1.00	1.00	1.00			1.00	1.00		1.00		
Incremental Delay, d2	0.4	0.0	1.5	0.1			1.0	0.2		0.0		
Delay (s)	7.8	5.6	20.7	2.6			18.8	17.4		17.2		
Level of Service	A	A	C	A			B	B		B		
Approach Delay (s)	7.7			6.2			17.9			17.2		
Approach LOS	A			A			B			B		
<b>Intersection Summary</b>												
HCM Average Control Delay		8.9		HCM Level of Service				A				
HCM Volume to Capacity ratio		0.45										
Actuated Cycle Length (s)		45.2		Sum of lost time (s)				12.0				
Intersection Capacity Utilization		56.2%		ICU Level of Service				B				
Analysis Period (min)		15										
c Critical Lane Group												



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑	↑	↑		↑	↑
Volume (veh/h)	187	278	148	70	111	118
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	215	320	170	80	128	136
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	251			960	210	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	251			960	210	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	84			47	84	
cM capacity (veh/h)	1327			239	835	
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	215	320	251	128	136	
Volume Left	215	0	0	128	0	
Volume Right	0	0	80	0	136	
cSH	1327	1700	1700	239	835	
Volume to Capacity	0.16	0.19	0.15	0.53	0.16	
Queue Length 95th (ft)	14	0	0	71	14	
Control Delay (s)	8.2	0.0	0.0	36.2	10.1	
Lane LOS	A			E	B	
Approach Delay (s)	3.3		0.0	22.8		
Approach LOS				C		
<b>Intersection Summary</b>						
Average Delay			7.4			
Intersection Capacity Utilization		38.6%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	306	63	2	167	0	49	0	3	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	1	352	72	2	192	0	56	0	3	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	192			424			587	587	388	590	623	192
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	192			424			587	587	388	590	623	192
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			87	100	99	100	100	100
cM capacity (veh/h)	1394			1146			423	423	665	419	404	855
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	425	194	60	0								
Volume Left	1	2	56	0								
Volume Right	72	0	3	0								
cSH	1394	1146	432	1700								
Volume to Capacity	0.00	0.00	0.14	0.00								
Queue Length 95th (ft)	0	0	12	0								
Control Delay (s)	0.0	0.1	14.7	0.0								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.0	0.1	14.7	0.0								
Approach LOS		B	A									
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization		30.5%		ICU Level of Service					A			
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	79	210	3	2	140	70	3	0	0	89	0	38
Sign Control		Free				Free			Stop			Stop
Grade		0%				0%			0%			0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	84	223	3	2	149	74	3	0	0	95	0	40
Pedestrians						1						
Lane Width (ft)						12.0						
Walking Speed (ft/s)						4.0						
Percent Blockage						0						
Right turn flare (veh)												
Median type			None			None						
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	223			227			624	621	226	585	585	186
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	223			227			624	621	226	585	585	186
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.4
p0 queue free %	94			100			99	100	100	76	100	95
cM capacity (veh/h)	1328			1354			363	380	818	400	398	841
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	311	226	3	135								
Volume Left	84	2	3	95								
Volume Right	3	74	0	40								
cSH	1328	1354	363	475								
Volume to Capacity	0.06	0.00	0.01	0.28								
Queue Length 95th (ft)	5	0	1	29								
Control Delay (s)	2.6	0.1	15.0	15.6								
Lane LOS	A	A	C	C								
Approach Delay (s)	2.6	0.1	15.0	15.6								
Approach LOS			C	C								
<b>Intersection Summary</b>												
Average Delay			4.4									
Intersection Capacity Utilization		43.9%		ICU Level of Service								
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↓		↑	↑↓			↔		↑	↑	↑
Volume (vph)	96	582	0	1	455	54	0	0	0	49	0	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0						4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95						1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00						1.00	1.00
Fr <sub>t</sub>	1.00	1.00		1.00	0.98						1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00						0.95	1.00
Satd. Flow (prot)	1805	3610		1804	3474						1752	1615
Flt Permitted	0.95	1.00		0.95	1.00						0.91	1.00
Satd. Flow (perm)	1805	3610		1804	3474						1677	1615
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	112	677	0	1	529	63	0	0	0	57	0	64
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	0	48
Lane Group Flow (vph)	112	677	0	1	585	0	0	0	0	0	57	16
Confl. Peds. (#/hr)			3	3								
Confl. Bikes (#/hr)			1			1				1		
Heavy Vehicles (%)	0%	0%	0%	0%	2%	3%	0%	0%	0%	3%	0%	0%
Turn Type	Prot			Prot			Perm			Perm		pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases							2			6		6
Actuated Green, G (s)	6.8	27.0		0.8	21.0						4.4	11.2
Effective Green, g (s)	6.8	27.0		0.8	21.0						4.4	11.2
Actuated g/C Ratio	0.15	0.61		0.02	0.48						0.10	0.25
Clearance Time (s)	4.0	4.0		4.0	4.0						4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)	278	2205		33	1651						167	555
v/s Ratio Prot	c0.06	0.19		0.00	c0.17							0.00
v/s Ratio Perm											c0.03	0.01
v/c Ratio	0.40	0.31		0.03	0.35						0.34	0.03
Uniform Delay, d1	16.9	4.1		21.3	7.3						18.5	12.4
Progression Factor	1.00	1.00		1.00	1.00						1.00	1.00
Incremental Delay, d2	1.0	0.1		0.4	0.1						1.2	0.0
Delay (s)	17.8	4.2		21.7	7.5						19.8	12.4
Level of Service	B	A		C	A						B	B
Approach Delay (s)		6.1			7.5			0.0			15.9	
Approach LOS		A			A			A			B	

#### Intersection Summary

HCM Average Control Delay	7.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	44.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑↑		↑	↑		↑	↑	
Volume (vph)	38	380	229	36	255	7	213	26	89	10	15	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.88		1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1900	1599	1805	3559		1786	1680		1805	1714	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.73	1.00		0.68	1.00	
Satd. Flow (perm)	1805	1900	1599	1805	3559		1376	1680		1293	1714	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	39	392	236	37	263	7	220	27	92	10	15	23
RTOR Reduction (vph)	0	0	140	0	2	0	0	65	0	0	16	0
Lane Group Flow (vph)	39	392	96	37	268	0	220	54	0	10	22	0
Confl. Peds. (#/hr)	2					2	2					2
Heavy Vehicles (%)	0%	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot		Perm	Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	2.2	19.9	19.9	2.4	20.1		14.5	14.5		14.5	14.5	
Effective Green, g (s)	2.2	19.9	19.9	2.4	20.1		14.5	14.5		14.5	14.5	
Actuated g/C Ratio	0.05	0.41	0.41	0.05	0.41		0.30	0.30		0.30	0.30	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	81	775	652	89	1466		409	499		384	509	
v/s Ratio Prot	c0.02	c0.21		0.02	0.08			0.03			0.01	
v/s Ratio Perm			0.06				c0.16			0.01		
v/c Ratio	0.48	0.51	0.15	0.42	0.18		0.54	0.11		0.03	0.04	
Uniform Delay, d1	22.7	10.8	9.1	22.5	9.1		14.3	12.5		12.1	12.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.5	0.5	0.1	3.1	0.1		1.4	0.1		0.0	0.0	
Delay (s)	27.2	11.3	9.2	25.6	9.2		15.7	12.6		12.2	12.2	
Level of Service	C	B	A	C	A		B	B		B	B	
Approach Delay (s)		11.5			11.2			14.6			12.2	
Approach LOS		B			B			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			12.2				HCM Level of Service			B		
HCM Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			48.8				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			51.8%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	70	72	268	179	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	3	80	83	308	206	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				358		
pX, platoon unblocked	0.90					
vC, conflicting volume	682	209	211			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	591	209	211			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	90	94			
cM capacity (veh/h)	400	837	1359			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	84	83	308	211		
Volume Left	3	83	0	0		
Volume Right	80	0	0	6		
cSH	801	1359	1700	1700		
Volume to Capacity	0.10	0.06	0.18	0.12		
Queue Length 95th (ft)	9	5	0	0		
Control Delay (s)	10.0	7.8	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	10.0	1.7		0.0		
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			2.2			
Intersection Capacity Utilization		28.2%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑	↑	↑	↑	↑
Volume (vph)	85	194	82	99	125	45	62	261	153	76	333	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.96	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1802		1735	1791		1805	1881	1557	1799	1881	1579
Flt Permitted	0.58	1.00		0.37	1.00		0.36	1.00	1.00	0.41	1.00	1.00
Satd. Flow (perm)	1101	1802		683	1791		693	1881	1557	769	1881	1579
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	100	228	96	116	147	53	73	307	180	89	392	64
RTOR Reduction (vph)	0	22	0	0	18	0	0	0	125	0	0	43
Lane Group Flow (vph)	100	302	0	116	182	0	73	307	55	89	392	21
Confl. Peds. (#/hr)			1	1					12	12		
Confl. Bikes (#/hr)			3			1			1			2
Heavy Vehicles (%)	0%	0%	0%	4%	1%	2%	0%	1%	0%	0%	1%	0%
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	20.1	15.8		20.1	15.8		20.9	17.9	17.9	23.5	19.2	19.2
Effective Green, g (s)	20.1	15.8		20.1	15.8		20.9	17.9	17.9	23.5	19.2	19.2
Actuated g/C Ratio	0.34	0.27		0.34	0.27		0.36	0.31	0.31	0.40	0.33	0.33
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	432	488		313	485		306	578	478	386	619	520
v/s Ratio Prot	0.02	c0.17		c0.03	0.10		0.01	0.16		c0.02	c0.21	
v/s Ratio Perm	0.06			0.10			0.07		0.04	0.08		0.01
v/c Ratio	0.23	0.62		0.37	0.37		0.24	0.53	0.12	0.23	0.63	0.04
Uniform Delay, d1	13.3	18.6		13.7	17.2		12.8	16.7	14.5	11.2	16.6	13.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	2.3		0.7	0.5		0.4	0.9	0.1	0.3	2.1	0.0
Delay (s)	13.5	21.0		14.4	17.7		13.2	17.7	14.6	11.5	18.7	13.3
Level of Service	B	C		B	B		B	B	B	B	B	B
Approach Delay (s)		19.2			16.5			16.1			16.9	
Approach LOS		B			B			B			B	

#### Intersection Summary

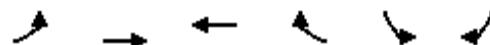
HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	58.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

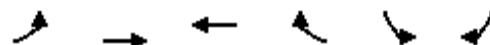


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (vph)	256	54	286	292	68	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	1615	1845	1569	1805	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.34	1.00
Satd. Flow (perm)	1787	1615	1845	1569	655	1881
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	316	67	353	360	84	223
RTOR Reduction (vph)	0	42	0	238	0	0
Lane Group Flow (vph)	316	25	353	122	84	223
Confl. Bikes (#/hr)				8		
Heavy Vehicles (%)	1%	0%	3%	0%	0%	1%
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	16.5	16.5	18.4	18.4	28.7	28.7
Effective Green, g (s)	16.5	16.5	18.4	18.4	28.7	28.7
Actuated g/C Ratio	0.30	0.30	0.34	0.34	0.53	0.53
Clearance Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	544	492	626	533	459	996
v/s Ratio Prot	c0.18		c0.19		0.02	c0.12
v/s Ratio Perm		0.02		0.08	0.08	
v/c Ratio	0.58	0.05	0.56	0.23	0.18	0.22
Uniform Delay, d1	15.9	13.3	14.6	12.8	7.1	6.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.0	1.2	0.2	0.2	0.1
Delay (s)	17.5	13.4	15.8	13.0	7.2	6.9
Level of Service	B	B	B	B	A	A
Approach Delay (s)	16.8		14.4		7.0	
Approach LOS	B		B		A	
Intersection Summary						
HCM Average Control Delay		13.4		HCM Level of Service		B
HCM Volume to Capacity ratio		0.54				
Actuated Cycle Length (s)		54.2		Sum of lost time (s)		14.0
Intersection Capacity Utilization		44.7%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

## Appendix I Sensitivity Analysis at NE Ingle Road/NE Goodwin Road



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	97	278	148	52	101	64
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	111	320	170	60	116	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	230			743	200	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	230			743	200	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	92			67	91	
cM capacity (veh/h)	1350			351	846	
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	431	230	116	74		
Volume Left	111	0	116	0		
Volume Right	0	60	0	74		
cSH	1350	1700	351	846		
Volume to Capacity	0.08	0.14	0.33	0.09		
Queue Length 95th (ft)	7	0	35	7		
Control Delay (s)	2.6	0.0	20.2	9.7		
Lane LOS	A		C	A		
Approach Delay (s)	2.6	0.0	16.1			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			4.9			
Intersection Capacity Utilization		46.5%		ICU Level of Service		A
Analysis Period (min)			15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑	↑	↑		↑	↑
Volume (veh/h)	181	278	148	68	111	114
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	208	320	170	78	128	131
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	248			945	209	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	248			945	209	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	84			48	84	
cM capacity (veh/h)	1329			245	836	
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	208	320	248	128	131	
Volume Left	208	0	0	128	0	
Volume Right	0	0	78	0	131	
cSH	1329	1700	1700	245	836	
Volume to Capacity	0.16	0.19	0.15	0.52	0.16	
Queue Length 95th (ft)	14	0	0	69	14	
Control Delay (s)	8.2	0.0	0.0	34.6	10.1	
Lane LOS	A			D	B	
Approach Delay (s)	3.2		0.0	22.2		
Approach LOS				C		
<b>Intersection Summary</b>						
Average Delay			7.2			
Intersection Capacity Utilization		38.1%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑ ↗	↑ ↘	↗ ↖		↑ ↗	↑ ↘
Volume (veh/h)	184	278	148	69	111	114
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	211	320	170	79	128	131
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	249			952	210	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	249			952	210	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	84			47	84	
cM capacity (veh/h)	1328			242	836	
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	211	320	249	128	131	
Volume Left	211	0	0	128	0	
Volume Right	0	0	79	0	131	
cSH	1328	1700	1700	242	836	
Volume to Capacity	0.16	0.19	0.15	0.53	0.16	
Queue Length 95th (ft)	14	0	0	70	14	
Control Delay (s)	8.2	0.0	0.0	35.4	10.1	
Lane LOS	A			E	B	
Approach Delay (s)	3.3		0.0	22.6		
Approach LOS				C		
<b>Intersection Summary</b>						
Average Delay			7.3			
Intersection Capacity Utilization		38.3%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑	↑	↑		↑	↑
Volume (veh/h)	187	278	148	70	111	118
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	215	320	170	80	128	136
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	251			960	210	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	251			960	210	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	84			47	84	
cM capacity (veh/h)	1327			239	835	
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	215	320	251	128	136	
Volume Left	215	0	0	128	0	
Volume Right	0	0	80	0	136	
cSH	1327	1700	1700	239	835	
Volume to Capacity	0.16	0.19	0.15	0.53	0.16	
Queue Length 95th (ft)	14	0	0	71	14	
Control Delay (s)	8.2	0.0	0.0	36.2	10.1	
Lane LOS	A			E	B	
Approach Delay (s)	3.3		0.0	22.8		
Approach LOS				C		
<b>Intersection Summary</b>						
Average Delay			7.4			
Intersection Capacity Utilization		38.6%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (veh/h)	187	278	148	70	111	118
Sign Control	Free	Free			Stop	
Grade	0%	0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	215	320	170	80	128	136
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None	None				
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	251			920	170	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	251			920	170	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	84			49	85	
cM capacity (veh/h)	1327			252	879	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	215	320	170	80	128	136
Volume Left	215	0	0	0	128	0
Volume Right	0	0	0	80	0	136
cSH	1327	1700	1700	1700	252	879
Volume to Capacity	0.16	0.19	0.10	0.05	0.51	0.15
Queue Length 95th (ft)	14	0	0	0	66	14
Control Delay (s)	8.2	0.0	0.0	0.0	33.0	9.8
Lane LOS	A				D	A
Approach Delay (s)	3.3		0.0		21.1	
Approach LOS					C	
<b>Intersection Summary</b>						
Average Delay			7.0			
Intersection Capacity Utilization		34.3%		ICU Level of Service		A
Analysis Period (min)		15				

## Appendix J 2029 Background Conditions Worksheets



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↓	↖	↙	↗	↘
Volume (veh/h)	59	209	16	204	200	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	69	243	19	237	233	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		312		465	190	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		312		465	190	
tC, single (s)		4.1		6.4	7.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	4.2	
p0 queue free %		99		57	99	
cM capacity (veh/h)		1260		544	653	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	312	256	237			
Volume Left	0	19	233			
Volume Right	243	0	5			
cSH	1700	1260	546			
Volume to Capacity	0.18	0.01	0.43			
Queue Length 95th (ft)	0	1	55			
Control Delay (s)	0.0	0.7	16.6			
Lane LOS		A	C			
Approach Delay (s)	0.0	0.7	16.6			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay		5.1				
Intersection Capacity Utilization		41.9%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Volume (vph)	237	272	376	92	619	434
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8		5.4		5.7	5.4
Lane Util. Factor	1.00		1.00		1.00	1.00
Fr <sub>t</sub>	0.93		0.97		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1611		1645		1805	1881
Flt Permitted	0.98		1.00		0.15	1.00
Satd. Flow (perm)	1611		1645		286	1881
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	237	272	376	92	619	434
RTOR Reduction (vph)	28	0	7	0	0	0
Lane Group Flow (vph)	481	0	461	0	619	434
Heavy Vehicles (%)	0%	13%	14%	6%	0%	1%
Turn Type				pm+pt		
Protected Phases	6		4		3	8
Permitted Phases					8	
Actuated Green, G (s)	35.4		38.1		77.4	77.4
Effective Green, g (s)	35.4		38.1		77.4	77.4
Actuated g/C Ratio	0.29		0.31		0.62	0.62
Clearance Time (s)	5.8		5.4		5.7	5.4
Vehicle Extension (s)	1.0		1.0		1.0	1.0
Lane Grp Cap (vph)	460		505		590	1174
v/s Ratio Prot	c0.30		0.28		c0.28	0.23
v/s Ratio Perm					c0.37	
v/c Ratio	1.05		0.91		1.05	0.37
Uniform Delay, d1	44.3		41.4		33.2	11.4
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	54.5		20.6		50.6	0.1
Delay (s)	98.8		61.9		83.8	11.5
Level of Service	F		E		F	B
Approach Delay (s)	98.8		61.9			54.0
Approach LOS	F		E			D
Intersection Summary						
HCM Average Control Delay		67.0		HCM Level of Service		E
HCM Volume to Capacity ratio		1.03				
Actuated Cycle Length (s)		124.0		Sum of lost time (s)		11.5
Intersection Capacity Utilization		103.3%		ICU Level of Service		G
Analysis Period (min)		15				
c Critical Lane Group						



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	145	311	138	334	1	94	2	40	2	6	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0			4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00			1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00			1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00			1.00	1.00			1.00	
Fr <sub>t</sub>	1.00	0.85	1.00	1.00			1.00	0.85			0.98	
Flt Protected	1.00	1.00	0.95	1.00			0.95	1.00			0.99	
Satd. Flow (prot)	1767	1615	1671	1822			1634	1417			1454	
Flt Permitted	1.00	1.00	0.95	1.00			0.72	1.00			0.95	
Satd. Flow (perm)	1764	1615	1671	1822			1237	1417			1395	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	1	181	389	172	418	1	118	2	50	2	8	2
RTOR Reduction (vph)	0	0	248	0	0	0	0	0	41	0	2	0
Lane Group Flow (vph)	0	182	141	172	419	0	0	120	9	0	10	0
Confl. Peds. (#/hr)	1				1							
Heavy Vehicles (%)	100%	7%	0%	8%	4%	100%	11%	0%	14%	0%	40%	0%
Turn Type	Perm		Perm	Prot			Perm		Perm	Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4				2		2	6		
Actuated Green, G (s)	16.2	16.2	8.3	28.5			8.2	8.2			8.2	
Effective Green, g (s)	16.2	16.2	8.3	28.5			8.2	8.2			8.2	
Actuated g/C Ratio	0.36	0.36	0.19	0.64			0.18	0.18			0.18	
Clearance Time (s)	4.0	4.0	4.0	4.0			4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	639	585	310	1162			227	260			256	
v/s Ratio Prot			c0.10	c0.23								
v/s Ratio Perm	0.10	0.09					c0.10	0.01			0.01	
v/c Ratio	0.28	0.24	0.55	0.36			0.53	0.04			0.04	
Uniform Delay, d1	10.1	10.0	16.5	3.8			16.5	15.0			15.0	
Progression Factor	1.00	1.00	1.00	1.00			1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.2	2.1	0.2			2.2	0.1			0.1	
Delay (s)	10.4	10.2	18.7	4.0			18.7	15.1			15.1	
Level of Service	B	B	B	A			B	B			B	
Approach Delay (s)	10.2			8.3			17.6				15.1	
Approach LOS	B			A			B				B	

#### Intersection Summary

HCM Average Control Delay 10.4 HCM Level of Service B

HCM Volume to Capacity ratio 0.43

Actuated Cycle Length (s) 44.7 Sum of lost time (s) 8.0

Intersection Capacity Utilization 50.3% ICU Level of Service A

Analysis Period (min) 15

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (veh/h)	94	76	237	121	56	271
Sign Control	Free	Free			Stop	
Grade	0%	0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	106	85	266	136	63	304
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None	None				
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	402			563	266	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	402			563	266	
tC, single (s)	4.2			6.5	6.2	
tC, 2 stage (s)						
tF (s)	2.3			3.6	3.3	
p0 queue free %	91			85	60	
cM capacity (veh/h)	1125			433	765	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	106	85	266	136	63	304
Volume Left	106	0	0	0	63	0
Volume Right	0	0	0	136	0	304
cSH	1125	1700	1700	1700	433	765
Volume to Capacity	0.09	0.05	0.16	0.08	0.15	0.40
Queue Length 95th (ft)	8	0	0	0	13	48
Control Delay (s)	8.5	0.0	0.0	0.0	14.7	12.8
Lane LOS	A			B	B	
Approach Delay (s)	4.7		0.0		13.1	
Approach LOS				B		
<b>Intersection Summary</b>						
Average Delay			6.0			
Intersection Capacity Utilization		35.9%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	72	59	4	264	0	76	1	3	0	2	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	78	64	4	287	0	83	1	3	0	2	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	287			142			414	408	110	412	440	287
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	287			142			414	408	110	412	440	287
tC, single (s)	4.1			4.3			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			85	100	100	100	100	99
cM capacity (veh/h)	1287			1311			542	534	949	549	512	757
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	143	291	87	7								
Volume Left	1	4	83	0								
Volume Right	64	0	3	4								
cSH	1287	1311	551	653								
Volume to Capacity	0.00	0.00	0.16	0.01								
Queue Length 95th (ft)	0	0	14	1								
Control Delay (s)	0.1	0.1	12.8	10.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	12.8	10.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization		34.3%		ICU Level of Service					A			
Analysis Period (min)		15										



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	77	3	0	213	54	2	0	0	68	1	64
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	11	96	4	0	266	68	2	0	0	85	1	80
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	334			100			501	454	98	421	422	300
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	334			100			501	454	98	421	422	300
tC, single (s)	4.3			4.1			8.1	6.5	6.2	7.2	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			4.4	4.0	3.3	3.6	4.0	3.4
p0 queue free %	99			100			99	100	100	84	100	89
cM capacity (veh/h)	1108			1505			312	500	963	525	521	719
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	111	334	2	166								
Volume Left	11	0	2	85								
Volume Right	4	68	0	80								
cSH	1108	1505	312	603								
Volume to Capacity	0.01	0.00	0.01	0.28								
Queue Length 95th (ft)	1	0	1	28								
Control Delay (s)	0.9	0.0	16.6	13.2								
Lane LOS	A		C	B								
Approach Delay (s)	0.9	0.0	16.6	13.2								
Approach LOS			C	B								
<b>Intersection Summary</b>												
Average Delay			3.8									
Intersection Capacity Utilization		28.1%		ICU Level of Service					A			
Analysis Period (min)			15									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↓		↑	↑↓			↔		↑	↑	↑
Volume (vph)	403	286	0	0	311	47	0	0	1	39	0	333
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.95			1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00			0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00			1.00		1.00	1.00	1.00
Fr <sub>t</sub>	1.00	1.00			0.98			0.86		1.00	0.85	
Flt Protected	0.95	1.00			1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1671	3505			3436			1623		1804	1489	
Flt Permitted	0.95	1.00			1.00			1.00		0.91	1.00	
Satd. Flow (perm)	1671	3505			3436			1623		1727	1489	
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	537	381	0	0	415	63	0	0	1	52	0	444
RTOR Reduction (vph)	0	0	0	0	14	0	0	1	0	0	0	94
Lane Group Flow (vph)	537	381	0	0	464	0	0	0	0	0	52	350
Confl. Peds. (#/hr)						4			1	1		4
Heavy Vehicles (%)	8%	3%	0%	0%	3%	3%	0%	0%	0%	0%	0%	8%
Turn Type	Prot			Prot			Perm			Perm		pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases						2				6		6
Actuated Green, G (s)	17.8	33.5			11.7			4.4		4.4		22.2
Effective Green, g (s)	17.8	33.5			11.7			4.4		4.4		22.2
Actuated g/C Ratio	0.39	0.73			0.25			0.10		0.10		0.48
Clearance Time (s)	4.0	4.0			4.0			4.0		4.0		4.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0		3.0
Lane Grp Cap (vph)	648	2558			876			156		166		850
v/s Ratio Prot	c0.32	0.11			c0.14			0.00				c0.16
v/s Ratio Perm											0.03	0.08
v/c Ratio	0.83	0.15			0.53			0.00		0.31		0.41
Uniform Delay, d1	12.7	1.9			14.7			18.8		19.3		7.6
Progression Factor	1.00	1.00			1.00			1.00		1.00		1.00
Incremental Delay, d2	8.6	0.0			0.6			0.0		1.1		0.3
Delay (s)	21.3	1.9			15.3			18.8		20.4		8.0
Level of Service	C	A			B			B		C		A
Approach Delay (s)		13.2			15.3			18.8		9.3		
Approach LOS		B			B			B		A		
<b>Intersection Summary</b>												
HCM Average Control Delay		12.7			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.69										
Actuated Cycle Length (s)		45.9			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		53.6%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑↑		↑	↑		↑	↑	
Volume (vph)	8	189	203	139	254	6	127	10	94	22	39	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00		1.00	0.86		1.00	0.93	
Fl <sub>t</sub> Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1881	1531	1805	3527		1735	1613		1805	1751	
Fl <sub>t</sub> Permitted	0.95	1.00	1.00	0.95	1.00		0.69	1.00		0.67	1.00	
Satd. Flow (perm)	1805	1881	1531	1805	3527		1263	1613		1271	1751	
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	11	252	271	185	339	8	169	13	125	29	52	49
RTOR Reduction (vph)	0	0	178	0	2	0	0	94	0	0	37	0
Lane Group Flow (vph)	11	252	93	185	345	0	169	44	0	29	64	0
Confl. Peds. (#/hr)			4	4			1					1
Confl. Bikes (#/hr)							1					
Heavy Vehicles (%)	0%	1%	3%	0%	2%	0%	4%	0%	2%	0%	0%	0%
Turn Type	Prot		Perm	Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	1.0	17.5	17.5	8.5	25.0		12.8	12.8		12.8	12.8	
Effective Green, g (s)	1.0	17.5	17.5	8.5	25.0		12.8	12.8		12.8	12.8	
Actuated g/C Ratio	0.02	0.34	0.34	0.17	0.49		0.25	0.25		0.25	0.25	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	36	648	527	302	1736		318	406		320	441	
v/s Ratio Prot	0.01	c0.13		c0.10	0.10			0.03			0.04	
v/s Ratio Perm			0.06				c0.13			0.02		
v/c Ratio	0.31	0.39	0.18	0.61	0.20		0.53	0.11		0.09	0.15	
Uniform Delay, d1	24.6	12.6	11.6	19.6	7.3		16.4	14.6		14.5	14.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.8	0.4	0.2	3.7	0.1		1.7	0.1		0.1	0.2	
Delay (s)	29.3	13.0	11.8	23.3	7.3		18.1	14.7		14.7	14.9	
Level of Service	C	B	B	C	A		B	B		B	B	
Approach Delay (s)		12.7			12.9			16.6			14.9	
Approach LOS		B			B			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay		13.7			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.48										
Actuated Cycle Length (s)		50.8			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		43.1%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	4	74	71	123	234	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	4	83	80	138	263	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				358		
pX, platoon unblocked						
vC, conflicting volume	562	265	266			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	562	265	266			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	89	94			
cM capacity (veh/h)	461	779	1309			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	88	80	138	266		
Volume Left	4	80	0	0		
Volume Right	83	0	0	3		
cSH	752	1309	1700	1700		
Volume to Capacity	0.12	0.06	0.08	0.16		
Queue Length 95th (ft)	10	5	0	0		
Control Delay (s)	10.4	7.9	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	10.4	2.9		0.0		
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			2.7			
Intersection Capacity Utilization		31.2%		ICU Level of Service		A
Analysis Period (min)		15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑	↑	↑	↑	↑
Volume (vph)	64	45	24	197	154	73	64	311	96	32	249	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1677		1786	1763		1805	1827	1546	1751	1845	1509
Flt Permitted	0.51	1.00		0.54	1.00		0.39	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)	929	1677		1016	1763		734	1827	1546	643	1845	1509
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	85	60	32	263	205	97	85	415	128	43	332	107
RTOR Reduction (vph)	0	26	0	0	24	0	0	0	77	0	0	72
Lane Group Flow (vph)	85	66	0	263	278	0	85	415	51	43	332	35
Confl. Peds. (#/hr)				1	1				3	3		
Heavy Vehicles (%)	4%	0%	19%	1%	0%	8%	0%	4%	2%	3%	3%	7%
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	16.0	11.7		22.8	15.1		24.5	20.2	20.2	21.9	18.9	18.9
Effective Green, g (s)	16.0	11.7		22.8	15.1		24.5	20.2	20.2	21.9	18.9	18.9
Actuated g/C Ratio	0.27	0.20		0.39	0.26		0.42	0.34	0.34	0.37	0.32	0.32
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	313	335		496	454		385	630	533	297	595	487
v/s Ratio Prot	0.02	0.04		c0.07	c0.16		c0.02	c0.23		0.01	0.18	
v/s Ratio Perm	0.05			0.14			0.08		0.03	0.05		0.02
v/c Ratio	0.27	0.20		0.53	0.61		0.22	0.66	0.10	0.14	0.56	0.07
Uniform Delay, d1	16.3	19.5		12.9	19.2		10.8	16.3	13.0	12.1	16.4	13.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.3		1.1	2.4		0.3	2.5	0.1	0.2	1.1	0.1
Delay (s)	16.8	19.8		14.0	21.6		11.1	18.8	13.1	12.4	17.5	13.8
Level of Service	B	B		B	C		B	B	B	B	B	B
Approach Delay (s)		18.4			18.1			16.6			16.3	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay		17.1					HCM Level of Service			B		
HCM Volume to Capacity ratio		0.59										
Actuated Cycle Length (s)		58.6					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		49.4%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗
Volume (vph)	400	53	140	431	63	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1597	1482	1743	1509	1504	1900
Flt Permitted	0.95	1.00	1.00	1.00	0.47	1.00
Satd. Flow (perm)	1597	1482	1743	1509	748	1900
Peak-hour factor, PHF	0.72	0.72	0.72	0.72	0.72	0.72
Adj. Flow (vph)	556	74	194	599	88	340
RTOR Reduction (vph)	0	23	0	441	0	0
Lane Group Flow (vph)	556	51	194	158	88	340
Heavy Vehicles (%)	13%	9%	9%	7%	20%	0%
Turn Type	Perm		Perm	pm+pt		
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	27.4	27.4	16.2	16.2	24.9	24.9
Effective Green, g (s)	27.4	27.4	16.2	16.2	24.9	24.9
Actuated g/C Ratio	0.45	0.45	0.26	0.26	0.41	0.41
Clearance Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	714	662	461	399	349	772
v/s Ratio Prot	c0.35		0.11		0.02	c0.18
v/s Ratio Perm		0.03		0.10	0.09	
v/c Ratio	0.78	0.08	0.42	0.40	0.25	0.44
Uniform Delay, d1	14.4	9.7	18.7	18.5	11.7	13.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.4	0.1	0.6	0.7	0.4	0.4
Delay (s)	19.7	9.8	19.3	19.2	12.1	13.6
Level of Service	B	A	B	B	B	B
Approach Delay (s)	18.6		19.2		13.3	
Approach LOS	B		B		B	
Intersection Summary						
HCM Average Control Delay		17.6	HCM Level of Service		B	
HCM Volume to Capacity ratio		0.62				
Actuated Cycle Length (s)		61.3	Sum of lost time (s)		9.0	
Intersection Capacity Utilization		44.7%	ICU Level of Service		A	
Analysis Period (min)		15				
c Critical Lane Group						

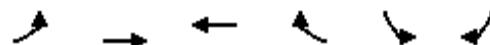


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Volume (veh/h)	177	192	11	109	185	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	195	211	12	120	203	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		405		444	300	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		405		444	300	
tC, single (s)		4.1		6.4	6.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	3.3	
p0 queue free %		99		64	98	
cM capacity (veh/h)		1164		566	744	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	405	132	216			
Volume Left	0	12	203			
Volume Right	211	0	13			
cSH	1700	1164	574			
Volume to Capacity	0.24	0.01	0.38			
Queue Length 95th (ft)	0	1	44			
Control Delay (s)	0.0	0.8	15.0			
Lane LOS		A	C			
Approach Delay (s)	0.0	0.8	15.0			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay		4.5				
Intersection Capacity Utilization		38.7%	ICU Level of Service		A	
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Volume (vph)	242	140	846	287	192	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8		5.4		5.7	5.4
Lane Util. Factor	1.00		1.00		1.00	1.00
Frpb, ped/bikes	0.99		0.99		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Fr <sub>t</sub>	0.95		0.97		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1712		1800		1752	1881
Flt Permitted	0.97		1.00		0.07	1.00
Satd. Flow (perm)	1712		1800		120	1881
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	242	140	846	287	192	500
RTOR Reduction (vph)	14	0	7	0	0	0
Lane Group Flow (vph)	368	0	1126	0	192	500
Confl. Peds. (#/hr)			2		8	8
Heavy Vehicles (%)	2%	0%	1%	2%	3%	1%
Turn Type					pm+pt	
Protected Phases	6		4		3	8
Permitted Phases					8	
Actuated Green, G (s)	28.1		55.6		72.8	72.8
Effective Green, g (s)	28.1		55.6		72.8	72.8
Actuated g/C Ratio	0.25		0.50		0.65	0.65
Clearance Time (s)	5.8		5.4		5.7	5.4
Vehicle Extension (s)	1.0		1.0		1.0	1.0
Lane Grp Cap (vph)	429		893		245	1222
v/s Ratio Prot	c0.21		c0.63		c0.08	0.27
v/s Ratio Perm					0.43	
v/c Ratio	0.86		1.26		0.78	0.41
Uniform Delay, d1	40.1		28.2		33.1	9.4
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	14.9		126.4		14.0	0.1
Delay (s)	55.0		154.7		47.1	9.5
Level of Service	E		F		D	A
Approach Delay (s)	55.0		154.7			19.9
Approach LOS	E		F			B
<b>Intersection Summary</b>						
HCM Average Control Delay		95.2		HCM Level of Service		F
HCM Volume to Capacity ratio		1.09				
Actuated Cycle Length (s)		112.1		Sum of lost time (s)		16.9
Intersection Capacity Utilization		109.0%		ICU Level of Service		G
Analysis Period (min)		15				
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	442	27	67	279	2	50	6	110	1	4	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00				1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00				1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00				1.00	1.00		1.00	
Fr <sub>t</sub>	1.00	0.85	1.00	1.00				1.00	0.85		0.98	
Fl <sub>t</sub> Protected	1.00	1.00	0.95	1.00				0.96	1.00		0.99	
Satd. Flow (prot)	1862	1615	1770	1879				1819	1548		1850	
Fl <sub>t</sub> Permitted	1.00	1.00	0.95	1.00				0.74	1.00		0.96	
Satd. Flow (perm)	1855	1615	1770	1879				1414	1548		1780	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	7	502	31	76	317	2	57	7	125	1	5	1
RTOR Reduction (vph)	0	0	15	0	0	0	0	0	109	0	1	0
Lane Group Flow (vph)	0	509	16	76	319	0	0	64	16	0	6	0
Confl. Peds. (#/hr)	2					2			3	3		
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	2%	0%	2%	1%	0%	0%	0%	2%	0%	0%	0%
Turn Type	Perm		Perm	Prot			Perm		Perm	Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4				2		2	6		
Actuated Green, G (s)	25.3	25.3	4.5	33.8				6.2	6.2		6.2	
Effective Green, g (s)	25.3	25.3	4.5	33.8				6.2	6.2		6.2	
Actuated g/C Ratio	0.53	0.53	0.09	0.70				0.13	0.13		0.13	
Clearance Time (s)	4.0	4.0	4.0	4.0				4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0				3.0	3.0		3.0	
Lane Grp Cap (vph)	978	851	166	1323			183	200		230		
v/s Ratio Prot		c0.04		0.17								
v/s Ratio Perm	c0.27	0.01					c0.05	0.01		0.00		
v/c Ratio	0.52	0.02	0.46	0.24			0.35	0.08		0.03		
Uniform Delay, d1	7.4	5.4	20.6	2.5			19.1	18.4		18.3		
Progression Factor	1.00	1.00	1.00	1.00			1.00	1.00		1.00		
Incremental Delay, d2	0.5	0.0	2.0	0.1			1.2	0.2		0.0		
Delay (s)	7.9	5.4	22.6	2.6			20.2	18.6		18.3		
Level of Service	A	A	C	A			C	B		B		
Approach Delay (s)	7.8			6.5			19.1			18.3		
Approach LOS	A			A			B			B		
<b>Intersection Summary</b>												
HCM Average Control Delay		9.3		HCM Level of Service				A				
HCM Volume to Capacity ratio		0.48										
Actuated Cycle Length (s)		48.0		Sum of lost time (s)				12.0				
Intersection Capacity Utilization		59.8%		ICU Level of Service				B				
Analysis Period (min)		15										
c Critical Lane Group												



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (veh/h)	198	310	165	76	123	124
Sign Control	Free	Free			Stop	
Grade	0%	0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	228	356	190	87	141	143
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None	None				
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	277			1001	190	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	277			1001	190	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	82			36	83	
cM capacity (veh/h)	1298			222	857	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	228	356	190	87	141	143
Volume Left	228	0	0	0	141	0
Volume Right	0	0	0	87	0	143
cSH	1298	1700	1700	1700	222	857
Volume to Capacity	0.18	0.21	0.11	0.05	0.64	0.17
Queue Length 95th (ft)	16	0	0	0	95	15
Control Delay (s)	8.4	0.0	0.0	0.0	46.0	10.0
Lane LOS	A				E	B
Approach Delay (s)	3.3		0.0		27.9	
Approach LOS					D	
<b>Intersection Summary</b>						
Average Delay			8.6			
Intersection Capacity Utilization	36.5%			ICU Level of Service		A
Analysis Period (min)	15					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	340	69	2	185	0	53	0	3	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	1	391	79	2	213	0	61	0	3	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	213			470			650	650	430	653	690	213
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	213			470			650	650	430	653	690	213
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			84	100	99	100	100	100
cM capacity (veh/h)	1370			1102			384	390	629	380	370	832
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	471	215	64	0								
Volume Left	1	2	61	0								
Volume Right	79	0	3	0								
cSH	1370	1102	392	1700								
Volume to Capacity	0.00	0.00	0.16	0.00								
Queue Length 95th (ft)	0	0	15	0								
Control Delay (s)	0.0	0.1	16.0	0.0								
Lane LOS	A	A	C	A								
Approach Delay (s)	0.0	0.1	16.0	0.0								
Approach LOS			C	A								
<b>Intersection Summary</b>												
Average Delay			1.4									
Intersection Capacity Utilization		32.7%		ICU Level of Service					A			
Analysis Period (min)		15										



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	88	234	3	2	155	78	3	0	0	99	0	42
Sign Control		Free				Free			Stop			Stop
Grade		0%				0%			0%			0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	94	249	3	2	165	83	3	0	0	105	0	45
Pedestrians						1						
Lane Width (ft)						12.0						
Walking Speed (ft/s)						4.0						
Percent Blockage						0						
Right turn flare (veh)												
Median type			None			None						
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	248			252			693	690	252	649	650	206
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	248			252			693	690	252	649	650	206
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.4
p0 queue free %	93			100			99	100	100	71	100	95
cM capacity (veh/h)	1301			1325			322	344	791	359	362	819
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	346	250	3	150								
Volume Left	94	2	3	105								
Volume Right	3	83	0	45								
cSH	1301	1325	322	432								
Volume to Capacity	0.07	0.00	0.01	0.35								
Queue Length 95th (ft)	6	0	1	38								
Control Delay (s)	2.7	0.1	16.3	17.7								
Lane LOS	A	A	C	C								
Approach Delay (s)	2.7	0.1	16.3	17.7								
Approach LOS			C	C								
<b>Intersection Summary</b>												
Average Delay			4.9									
Intersection Capacity Utilization		47.7%			ICU Level of Service				A			
Analysis Period (min)			15									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↓		↑	↑↓			↔		↑	↑	↑
Volume (vph)	104	646	0	1	503	59	0	0	0	53	0	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0						4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95						1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00						1.00	1.00
Fr <sub>t</sub>	1.00	1.00		1.00	0.98						1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00						0.95	1.00
Satd. Flow (prot)	1805	3610		1804	3475						1752	1615
Flt Permitted	0.95	1.00		0.95	1.00						0.87	1.00
Satd. Flow (perm)	1805	3610		1804	3475						1604	1615
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	121	751	0	1	585	69	0	0	0	62	0	70
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	0	52
Lane Group Flow (vph)	121	751	0	1	647	0	0	0	0	0	62	18
Confl. Peds. (#/hr)			3	3								
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	0%	0%	0%	2%	3%	0%	0%	0%	3%	0%	0%
Turn Type	Prot			Prot			Perm			Perm		pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases							2			6		6
Actuated Green, G (s)	7.2	29.0		0.8	22.6						4.6	11.8
Effective Green, g (s)	7.2	29.0		0.8	22.6						4.6	11.8
Actuated g/C Ratio	0.16	0.63		0.02	0.49						0.10	0.25
Clearance Time (s)	4.0	4.0		4.0	4.0						4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)	280	2256		31	1693						159	550
v/s Ratio Prot	c0.07	0.21		0.00	c0.19							0.01
v/s Ratio Perm											c0.04	0.01
v/c Ratio	0.43	0.33		0.03	0.38						0.39	0.03
Uniform Delay, d1	17.7	4.1		22.4	7.5						19.6	13.0
Progression Factor	1.00	1.00		1.00	1.00						1.00	1.00
Incremental Delay, d2	1.1	0.1		0.4	0.1						1.6	0.0
Delay (s)	18.8	4.2		22.8	7.6						21.2	13.0
Level of Service	B	A		C	A						C	B
Approach Delay (s)		6.2			7.7			0.0			16.9	
Approach LOS		A			A			A			B	
Intersection Summary												
HCM Average Control Delay			7.6		HCM Level of Service				A			
HCM Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			46.4		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			35.3%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘	↑ ↗	↑ ↘	↑ ↗ ↘	↑ ↘	↑ ↗	↑ ↘	↑ ↗	↑ ↘	↑ ↗	↑ ↘
Volume (vph)	41	422	254	39	282	8	232	29	96	11	17	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00		1.00	0.88		1.00	0.91	
Fl <sub>t</sub> Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1900	1599	1805	3559		1786	1681		1805	1721	
Fl <sub>t</sub> Permitted	0.95	1.00	1.00	0.95	1.00		0.73	1.00		0.67	1.00	
Satd. Flow (perm)	1805	1900	1599	1805	3559		1370	1681		1281	1721	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	42	435	262	40	291	8	239	30	99	11	18	25
RTOR Reduction (vph)	0	0	155	0	2	0	0	68	0	0	17	0
Lane Group Flow (vph)	42	435	107	40	297	0	239	61	0	11	26	0
Confl. Peds. (#/hr)	2					2	2					2
Heavy Vehicles (%)	0%	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot		Perm	Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	2.3	21.0	21.0	2.4	21.1		15.8	15.8		15.8	15.8	
Effective Green, g (s)	2.3	21.0	21.0	2.4	21.1		15.8	15.8		15.8	15.8	
Actuated g/C Ratio	0.04	0.41	0.41	0.05	0.41		0.31	0.31		0.31	0.31	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	81	779	656	85	1467		423	519		395	531	
v/s Ratio Prot	c0.02	c0.23		0.02	0.08			0.04			0.01	
v/s Ratio Perm			0.07				c0.17			0.01		
v/c Ratio	0.52	0.56	0.16	0.47	0.20		0.57	0.12		0.03	0.05	
Uniform Delay, d <sub>1</sub>	23.9	11.6	9.5	23.8	9.7		14.8	12.7		12.3	12.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d <sub>2</sub>	5.5	0.9	0.1	4.1	0.1		1.7	0.1		0.0	0.0	
Delay (s)	29.4	12.4	9.7	27.9	9.7		16.6	12.8		12.4	12.5	
Level of Service	C	B	A	C	A		B	B		B	B	
Approach Delay (s)		12.4			11.9			15.2			12.4	
Approach LOS		B			B			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			13.0			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			51.2			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			55.1%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	76	78	297	196	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	3	87	90	341	225	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				358		
pX, platoon unblocked	0.87					
vC, conflicting volume	749	228	231			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	641	228	231			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	89	93			
cM capacity (veh/h)	361	816	1337			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	91	90	341	231		
Volume Left	3	90	0	0		
Volume Right	87	0	0	6		
cSH	779	1337	1700	1700		
Volume to Capacity	0.12	0.07	0.20	0.14		
Queue Length 95th (ft)	10	5	0	0		
Control Delay (s)	10.2	7.9	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	10.2	1.6		0.0		
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			2.2			
Intersection Capacity Utilization		29.8%		ICU Level of Service		A
Analysis Period (min)		15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑	↑	↑	↑	↑
Volume (vph)	89	214	90	110	139	50	69	288	171	85	370	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.96	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1802		1735	1792		1805	1881	1556	1799	1881	1579
Flt Permitted	0.54	1.00		0.33	1.00		0.26	1.00	1.00	0.39	1.00	1.00
Satd. Flow (perm)	1030	1802		607	1792		498	1881	1556	742	1881	1579
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	105	252	106	129	164	59	81	339	201	100	435	69
RTOR Reduction (vph)	0	21	0	0	18	0	0	0	138	0	0	47
Lane Group Flow (vph)	105	337	0	129	205	0	81	339	63	100	435	22
Confl. Peds. (#/hr)				1	1				12	12		
Confl. Bikes (#/hr)				3			1		1			2
Heavy Vehicles (%)	0%	0%	0%	4%	1%	2%	0%	1%	0%	0%	1%	0%
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	21.6	17.4		21.6	17.4		23.4	19.2	19.2	23.4	19.2	19.2
Effective Green, g (s)	21.6	17.4		21.6	17.4		23.4	19.2	19.2	23.4	19.2	19.2
Actuated g/C Ratio	0.35	0.29		0.35	0.29		0.38	0.31	0.31	0.38	0.31	0.31
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	418	514		293	511		281	592	490	357	592	497
v/s Ratio Prot	0.02	c0.19		c0.03	0.11		c0.02	0.18		0.02	c0.23	
v/s Ratio Perm	0.07			0.13			0.09		0.04	0.09		0.01
v/c Ratio	0.25	0.65		0.44	0.40		0.29	0.57	0.13	0.28	0.73	0.04
Uniform Delay, d1	13.6	19.2		14.2	17.6		12.9	17.5	14.9	12.6	18.6	14.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	3.0		1.1	0.5		0.6	1.3	0.1	0.4	4.7	0.0
Delay (s)	13.9	22.2		15.2	18.1		13.5	18.8	15.0	13.0	23.3	14.6
Level of Service	B	C		B	B		B	B	B	B	C	B
Approach Delay (s)		20.3			17.1			16.9			20.6	
Approach LOS		C			B			B			C	
Intersection Summary												
HCM Average Control Delay			18.8		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			61.0		Sum of lost time (s)			16.0				
Intersection Capacity Utilization			59.7%		ICU Level of Service			B				
Analysis Period (min)			15									
c Critical Lane Group												



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (vph)	279	58	317	314	72	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	0.85	1.00	0.85	1.00	1.00
Fl <sub>t</sub> Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	1615	1845	1569	1805	1881
Fl <sub>t</sub> Permitted	0.95	1.00	1.00	1.00	0.31	1.00
Satd. Flow (perm)	1787	1615	1845	1569	593	1881
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	344	72	391	388	89	247
RTOR Reduction (vph)	0	41	0	252	0	0
Lane Group Flow (vph)	344	31	391	136	89	247
Confl. Bikes (#/hr)					8	
Heavy Vehicles (%)	1%	0%	3%	0%	0%	1%
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	18.2	18.2	20.4	20.4	30.9	30.9
Effective Green, g (s)	18.2	18.2	20.4	20.4	30.9	30.9
Actuated g/C Ratio	0.31	0.31	0.35	0.35	0.53	0.53
Clearance Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	560	506	648	551	430	1000
v/s Ratio Prot	c0.19		c0.21		0.02	c0.13
v/s Ratio Perm		0.02		0.09	0.09	
v/c Ratio	0.61	0.06	0.60	0.25	0.21	0.25
Uniform Delay, d1	17.0	14.0	15.5	13.4	7.7	7.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.1	1.6	0.2	0.2	0.1
Delay (s)	19.0	14.0	17.1	13.6	8.0	7.5
Level of Service	B	B	B	B	A	A
Approach Delay (s)	18.1		15.4			7.6
Approach LOS	B		B			A
Intersection Summary						
HCM Average Control Delay		14.4		HCM Level of Service		B
HCM Volume to Capacity ratio		0.58				
Actuated Cycle Length (s)		58.1		Sum of lost time (s)		14.0
Intersection Capacity Utilization		47.8%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

## Appendix K 2029 Total Traffic Conditions Worksheets



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑ ↗			↖ ↙	↖ ↗	
Volume (veh/h)	59	254	22	204	312	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	69	295	26	237	363	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		364		505	216	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		364		505	216	
tC, single (s)		4.1		6.4	7.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	4.2	
p0 queue free %		98		29	99	
cM capacity (veh/h)		1206		512	629	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	364	263	371			
Volume Left	0	26	363			
Volume Right	295	0	8			
cSH	1700	1206	514			
Volume to Capacity	0.21	0.02	0.72			
Queue Length 95th (ft)	0	2	146			
Control Delay (s)	0.0	1.0	28.0			
Lane LOS		A	D			
Approach Delay (s)	0.0	1.0	28.0			
Approach LOS			D			
<b>Intersection Summary</b>						
Average Delay		10.7				
Intersection Capacity Utilization		53.5%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	371	379	376	135	654	434
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8		5.4		5.7	5.4
Lane Util. Factor	1.00		1.00		1.00	1.00
Fr <sub>t</sub>	0.93		0.96		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1621		1638		1805	1881
Flt Permitted	0.98		1.00		0.13	1.00
Satd. Flow (perm)	1621		1638		246	1881
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	371	379	376	135	654	434
RTOR Reduction (vph)	25	0	10	0	0	0
Lane Group Flow (vph)	725	0	501	0	654	434
Heavy Vehicles (%)	0%	13%	14%	6%	0%	1%
Turn Type				pm+pt		
Protected Phases	6		4		3	8
Permitted Phases					8	
Actuated Green, G (s)	35.2		42.3		83.2	83.2
Effective Green, g (s)	35.2		42.3		83.2	83.2
Actuated g/C Ratio	0.27		0.33		0.64	0.64
Clearance Time (s)	5.8		5.4		5.7	5.4
Vehicle Extension (s)	1.0		1.0		1.0	1.0
Lane Grp Cap (vph)	440		535		581	1208
v/s Ratio Prot	c0.45		0.31		c0.31	0.23
v/s Ratio Perm					c0.42	
v/c Ratio	1.65		0.94		1.13	0.36
Uniform Delay, d1	47.2		42.3		36.1	10.8
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	301.8		23.7		76.9	0.1
Delay (s)	349.0		66.0		113.0	10.9
Level of Service	F		E		F	B
Approach Delay (s)	349.0		66.0			72.3
Approach LOS	F		E			E
Intersection Summary						
HCM Average Control Delay		159.3		HCM Level of Service		F
HCM Volume to Capacity ratio		1.26				
Actuated Cycle Length (s)		129.6		Sum of lost time (s)		11.5
Intersection Capacity Utilization		121.9%		ICU Level of Service		H
Analysis Period (min)		15				
c Critical Lane Group						



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	224	311	258	575	1	94	2	82	2	6	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	0.85	1.00	1.00	1.00	1.00	1.00	0.85	0.85	0.98		
Flt Protected	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00	1.00	0.99		
Satd. Flow (prot)	1770	1615	1671	1824			1634	1417	1454			
Flt Permitted	1.00	1.00	0.95	1.00	1.00	1.00	0.72	1.00	1.00	0.96		
Satd. Flow (perm)	1768	1615	1671	1824			1237	1417	1411			
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	1	280	389	322	719	1	118	2	102	2	8	2
RTOR Reduction (vph)	0	0	224	0	0	0	0	0	85	0	2	0
Lane Group Flow (vph)	0	281	165	322	720	0	0	120	17	0	10	0
Confl. Peds. (#/hr)	1				1							
Heavy Vehicles (%)	100%	7%	0%	8%	4%	100%	11%	0%	14%	0%	40%	0%
Turn Type	Perm		Perm	Prot			Perm		Perm	Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4				2		2	6		
Actuated Green, G (s)	30.1	30.1	17.0	51.1			11.9	11.9			11.9	
Effective Green, g (s)	30.1	30.1	17.0	51.1			11.9	11.9			11.9	
Actuated g/C Ratio	0.42	0.42	0.24	0.72			0.17	0.17			0.17	
Clearance Time (s)	4.0	4.0	4.0	4.0			4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	750	685	400	1313			207	237			236	
v/s Ratio Prot			c0.19	c0.39								
v/s Ratio Perm	0.16	0.10					c0.10	0.01			0.01	
v/c Ratio	0.37	0.24	0.81	0.55			0.58	0.07			0.04	
Uniform Delay, d1	14.0	13.1	25.4	4.6			27.2	24.9			24.8	
Progression Factor	1.00	1.00	1.00	1.00			1.00	1.00			1.00	
Incremental Delay, d2	0.3	0.2	11.2	1.7			3.9	0.1			0.1	
Delay (s)	14.3	13.3	36.6	6.3			31.1	25.0			24.9	
Level of Service	B	B	D	A			C	C			C	
Approach Delay (s)	13.7			15.6			28.3				24.9	
Approach LOS	B			B			C				C	

#### Intersection Summary

HCM Average Control Delay	16.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	71.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑ ↗	↑ ↘	↗ ↖	↗ ↙	↖ ↗	↖ ↙
Volume (veh/h)	167	124	384	133	104	485
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	188	139	431	149	117	545
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	581			946	431	
vC1, stage 1 conf vol				431		
vC2, stage 2 conf vol				515		
vCu, unblocked vol	581			946	431	
tC, single (s)	4.2			6.5	6.2	
tC, 2 stage (s)				5.5		
tF (s)	2.3			3.6	3.3	
p0 queue free %	81			72	12	
cM capacity (veh/h)	964			419	618	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	188	139	481	100	117	545
Volume Left	188	0	0	0	117	0
Volume Right	0	0	50	100	0	545
cSH	964	1700	1700	1700	419	618
Volume to Capacity	0.19	0.08	0.28	0.06	0.28	0.88
Queue Length 95th (ft)	18	0	0	0	28	261
Control Delay (s)	9.6	0.0	0.0	0.0	16.9	39.3
Lane LOS	A				C	E
Approach Delay (s)	5.5		0.0		35.3	
Approach LOS					E	
<b>Intersection Summary</b>						
Average Delay			16.0			
Intersection Capacity Utilization		59.6%		ICU Level of Service		B
Analysis Period (min)		15				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	91	124	4	285	0	108	1	3	0	2	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	99	135	4	310	0	117	1	3	0	2	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	310			234			492	487	166	491	554	310
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	310			234			492	487	166	491	554	310
tC, single (s)	4.1			4.3			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			76	100	100	100	100	99
cM capacity (veh/h)	1262			1210			480	482	883	487	441	735
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	235	314	122	7								
Volume Left	1	4	117	0								
Volume Right	135	0	3	4								
cSH	1262	1210	486	601								
Volume to Capacity	0.00	0.00	0.25	0.01								
Queue Length 95th (ft)	0	0	25	1								
Control Delay (s)	0.0	0.1	14.9	11.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.0	0.1	14.9	11.1								
Approach LOS			B	B								
<b>Intersection Summary</b>												
Average Delay			2.9									
Intersection Capacity Utilization		37.4%		ICU Level of Service								
Analysis Period (min)		15										

AM 2029 Total Traffic Conditions  
106: NE 28th St & NE 242nd Ave

11/20/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	94	3	0	230	54	2	0	0	68	1	67
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	12	118	4	0	288	68	2	0	0	85	1	84
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	355			121			550	499	119	466	468	321
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	355			121			550	499	119	466	468	321
tC, single (s)	4.3			4.1			8.1	6.5	6.2	7.2	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			4.4	4.0	3.3	3.6	4.0	3.4
p0 queue free %	99			100			99	100	100	83	100	88
cM capacity (veh/h)	1087			1479			284	471	938	490	490	699
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	134	355	2	170								
Volume Left	12	0	2	85								
Volume Right	4	68	0	84								
cSH	1087	1479	284	574								
Volume to Capacity	0.01	0.00	0.01	0.30								
Queue Length 95th (ft)	1	0	1	31								
Control Delay (s)	0.9	0.0	17.8	13.9								
Lane LOS	A		C	B								
Approach Delay (s)	0.9	0.0	17.8	13.9								
Approach LOS			C	B								
Intersection Summary												
Average Delay			3.8									
Intersection Capacity Utilization		29.1%		ICU Level of Service					A			
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↓		↑	↑↓			↔		↑	↑	↑
Volume (vph)	423	286	0	0	311	70	0	0	1	104	0	388
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.95			1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00			0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00			1.00			1.00		1.00	1.00	
Frt	1.00	1.00			0.97			0.86		1.00	0.85	
Flt Protected	0.95	1.00			1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1671	3505			3409			1623		1804	1484	
Flt Permitted	0.95	1.00			1.00			1.00		0.76	1.00	
Satd. Flow (perm)	1671	3505			3409			1623		1438	1484	
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	564	381	0	0	415	93	0	0	1	139	0	517
RTOR Reduction (vph)	0	0	0	0	22	0	0	1	0	0	0	80
Lane Group Flow (vph)	564	381	0	0	486	0	0	0	0	0	139	437
Confl. Peds. (#/hr)						4			1	1		4
Heavy Vehicles (%)	8%	3%	0%	0%	3%	3%	0%	0%	0%	0%	0%	8%
Turn Type	Prot			Prot			Perm			Perm		pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases						2				6		6
Actuated Green, G (s)	17.8	35.1			13.3			8.8		8.8		26.6
Effective Green, g (s)	17.8	35.1			13.3			8.8		8.8		26.6
Actuated g/C Ratio	0.34	0.68			0.26			0.17		0.17		0.51
Clearance Time (s)	4.0	4.0			4.0			4.0		4.0		4.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0		3.0
Lane Grp Cap (vph)	573	2370			874			275		244		875
v/s Ratio Prot	c0.34	0.11			c0.14			0.00				c0.17
v/s Ratio Perm											0.10	0.12
v/c Ratio	0.98	0.16			0.56			0.00		0.57		0.50
Uniform Delay, d1	16.9	3.1			16.7			17.9		19.8		8.3
Progression Factor	1.00	1.00			1.00			1.00		1.00		1.00
Incremental Delay, d2	33.3	0.0			0.8			0.0		3.0		0.4
Delay (s)	50.2	3.1			17.5			17.9		22.8		8.7
Level of Service	D	A			B			B		C		A
Approach Delay (s)		31.2			17.5			17.9		11.7		
Approach LOS		C			B			B		B		

#### Intersection Summary

HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	51.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑↑		↑	↑		↑	↑	
Volume (vph)	8	200	256	139	259	6	145	10	94	22	39	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.86		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1881	1531	1805	3527		1735	1613		1805	1751	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.69	1.00		0.67	1.00	
Satd. Flow (perm)	1805	1881	1531	1805	3527		1263	1613		1271	1751	
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	11	267	341	185	345	8	193	13	125	29	52	49
RTOR Reduction (vph)	0	0	230	0	1	0	0	93	0	0	36	0
Lane Group Flow (vph)	11	267	111	185	352	0	193	45	0	29	65	0
Confl. Peds. (#/hr)				4	4			1				1
Confl. Bikes (#/hr)								1				
Heavy Vehicles (%)	0%	1%	3%	0%	2%	0%	4%	0%	2%	0%	0%	0%
Turn Type	Prot		Perm	Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	1.0	17.9	17.9	11.0	27.9		14.1	14.1		14.1	14.1	
Effective Green, g (s)	1.0	17.9	17.9	11.0	27.9		14.1	14.1		14.1	14.1	
Actuated g/C Ratio	0.02	0.33	0.33	0.20	0.51		0.26	0.26		0.26	0.26	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	33	612	498	361	1789		324	414		326	449	
v/s Ratio Prot	0.01	c0.14		c0.10	0.10			0.03			0.04	
v/s Ratio Perm			0.07				c0.15			0.02		
v/c Ratio	0.33	0.44	0.22	0.51	0.20		0.60	0.11		0.09	0.14	
Uniform Delay, d1	26.7	14.6	13.5	19.6	7.4		17.9	15.6		15.6	15.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.9	0.5	0.2	1.2	0.1		2.9	0.1		0.1	0.1	
Delay (s)	32.6	15.1	13.7	20.8	7.5		20.9	15.8		15.7	15.9	
Level of Service	C	B	B	C	A		C	B		B	B	
Approach Delay (s)		14.6			12.1			18.7			15.9	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			14.7				HCM Level of Service			B		
HCM Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			44.6%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	4	80	74	126	240	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	4	90	83	142	270	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				358		
pX, platoon unblocked						
vC, conflicting volume	579	271	273			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	579	271	273			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	88	94			
cM capacity (veh/h)	450	772	1302			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	94	83	142	273		
Volume Left	4	83	0	0		
Volume Right	90	0	0	3		
cSH	747	1302	1700	1700		
Volume to Capacity	0.13	0.06	0.08	0.16		
Queue Length 95th (ft)	11	5	0	0		
Control Delay (s)	10.5	8.0	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	10.5	2.9		0.0		
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			2.8			
Intersection Capacity Utilization		32.1%		ICU Level of Service		A
Analysis Period (min)		15				



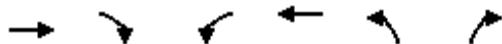
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑	↑	↑	↑	↑
Volume (vph)	69	45	24	197	154	74	64	312	96	39	247	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1677		1786	1761		1805	1827	1546	1751	1845	1509
Flt Permitted	0.50	1.00		0.54	1.00		0.39	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)	922	1677		1018	1761		740	1827	1546	639	1845	1509
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	92	60	32	263	205	99	85	416	128	52	329	133
RTOR Reduction (vph)	0	26	0	0	25	0	0	0	77	0	0	90
Lane Group Flow (vph)	92	66	0	263	279	0	85	416	51	52	329	43
Confl. Peds. (#/hr)				1	1				3	3		
Heavy Vehicles (%)	4%	0%	19%	1%	0%	8%	0%	4%	2%	3%	3%	7%
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	16.1	11.8		22.9	15.2		24.5	20.2	20.2	21.9	18.9	18.9
Effective Green, g (s)	16.1	11.8		22.9	15.2		24.5	20.2	20.2	21.9	18.9	18.9
Actuated g/C Ratio	0.27	0.20		0.39	0.26		0.42	0.34	0.34	0.37	0.32	0.32
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	313	337		498	456		387	629	532	295	594	486
v/s Ratio Prot	0.02	0.04		c0.07	c0.16		c0.02	c0.23		0.01	0.18	
v/s Ratio Perm	0.06			0.14			0.08		0.03	0.06		0.03
v/c Ratio	0.29	0.20		0.53	0.61		0.22	0.66	0.10	0.18	0.55	0.09
Uniform Delay, d1	16.3	19.5		12.9	19.1		10.8	16.3	13.1	12.2	16.4	13.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.3		1.0	2.4		0.3	2.6	0.1	0.3	1.1	0.1
Delay (s)	16.9	19.8		13.9	21.6		11.1	19.0	13.1	12.5	17.5	14.0
Level of Service	B	B		B	C		B	B	B	B	B	B
Approach Delay (s)		18.3			18.0			16.7			16.1	
Approach LOS		B			B			B			B	

#### Intersection Summary

HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	58.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (vph)	400	56	144	431	68	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1597	1482	1743	1509	1504	1900
Flt Permitted	0.95	1.00	1.00	1.00	0.47	1.00
Satd. Flow (perm)	1597	1482	1743	1509	738	1900
Peak-hour factor, PHF	0.72	0.72	0.72	0.72	0.72	0.72
Adj. Flow (vph)	556	78	200	599	94	351
RTOR Reduction (vph)	0	24	0	439	0	0
Lane Group Flow (vph)	556	54	200	160	94	351
Heavy Vehicles (%)	13%	9%	9%	7%	20%	0%
Turn Type	Perm		Perm	pm+pt		
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	27.5	27.5	16.5	16.5	25.2	25.2
Effective Green, g (s)	27.5	27.5	16.5	16.5	25.2	25.2
Actuated g/C Ratio	0.45	0.45	0.27	0.27	0.41	0.41
Clearance Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	712	661	466	404	347	776
v/s Ratio Prot	c0.35		0.11		0.02	c0.18
v/s Ratio Perm		0.04		0.11	0.09	
v/c Ratio	0.78	0.08	0.43	0.40	0.27	0.45
Uniform Delay, d1	14.5	9.8	18.7	18.5	11.8	13.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.6	0.1	0.6	0.6	0.4	0.4
Delay (s)	20.1	9.9	19.3	19.2	12.2	13.7
Level of Service	C	A	B	B	B	B
Approach Delay (s)	18.8		19.2		13.4	
Approach LOS	B		B		B	
Intersection Summary						
HCM Average Control Delay		17.7	HCM Level of Service		B	
HCM Volume to Capacity ratio		0.62				
Actuated Cycle Length (s)		61.7	Sum of lost time (s)		9.0	
Intersection Capacity Utilization		45.2%	ICU Level of Service		A	
Analysis Period (min)		15				
c Critical Lane Group						



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Volume (veh/h)	177	329	26	109	278	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	195	362	29	120	305	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		556		552	375	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		556		552	375	
tC, single (s)		4.1		6.4	6.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	3.3	
p0 queue free %		97		36	95	
cM capacity (veh/h)		1025		481	676	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	556	148	338			
Volume Left	0	29	305			
Volume Right	362	0	33			
cSH	1700	1025	495			
Volume to Capacity	0.33	0.03	0.68			
Queue Length 95th (ft)	0	2	129			
Control Delay (s)	0.0	1.9	26.6			
Lane LOS		A	D			
Approach Delay (s)	0.0	1.9	26.6			
Approach LOS			D			
<b>Intersection Summary</b>						
Average Delay		8.9				
Intersection Capacity Utilization		53.4%	ICU Level of Service		A	
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Volume (vph)	290	207	846	374	306	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8		5.4		5.7	5.4
Lane Util. Factor	1.00		1.00		1.00	1.00
Frpb, ped/bikes	0.99		0.98		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.94		0.96		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1703		1771		1752	1881
Flt Permitted	0.97		1.00		0.07	1.00
Satd. Flow (perm)	1703		1771		121	1881
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	290	207	846	374	306	500
RTOR Reduction (vph)	17	0	10	0	0	0
Lane Group Flow (vph)	480	0	1210	0	306	500
Confl. Peds. (#/hr)			2		8	8
Heavy Vehicles (%)	2%	0%	1%	2%	3%	1%
Turn Type					pm+pt	
Protected Phases	6		4		3	8
Permitted Phases					8	
Actuated Green, G (s)	35.1		55.2		82.3	82.3
Effective Green, g (s)	35.1		55.2		82.3	82.3
Actuated g/C Ratio	0.27		0.43		0.64	0.64
Clearance Time (s)	5.8		5.4		5.7	5.4
Vehicle Extension (s)	1.0		1.0		1.0	1.0
Lane Grp Cap (vph)	465		760		349	1204
v/s Ratio Prot	c0.28		c0.68		c0.15	0.27
v/s Ratio Perm					0.41	
v/c Ratio	1.03		1.59		0.88	0.42
Uniform Delay, d1	46.7		36.7		41.3	11.4
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	50.0		272.5		20.5	0.1
Delay (s)	96.8		309.2		61.8	11.4
Level of Service	F		F		E	B
Approach Delay (s)	96.8		309.2			30.6
Approach LOS	F		F			C
<b>Intersection Summary</b>						
HCM Average Control Delay		178.3		HCM Level of Service		F
HCM Volume to Capacity ratio		1.28				
Actuated Cycle Length (s)		128.6		Sum of lost time (s)		16.9
Intersection Capacity Utilization		127.4%		ICU Level of Service		H
Analysis Period (min)		15				
c Critical Lane Group						



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	643	27	182	394	2	50	6	295	1	4	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	0.85	0.98	0.98	0.98
Flt Protected	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.96	1.00	0.99	0.99	0.99
Satd. Flow (prot)	1862	1615	1770	1880	1880	1880	1880	1819	1546	1849	1849	1849
Flt Permitted	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.74	1.00	0.97	0.97	0.97
Satd. Flow (perm)	1856	1615	1770	1880	1880	1880	1880	1414	1546	1802	1802	1802
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	7	731	31	207	448	2	57	7	335	1	5	1
RTOR Reduction (vph)	0	0	9	0	0	0	0	0	288	0	1	0
Lane Group Flow (vph)	0	738	22	207	450	0	0	64	47	0	6	0
Confl. Peds. (#/hr)	2					2			3	3		
Confl. Bikes (#/hr)							1					
Heavy Vehicles (%)	0%	2%	0%	2%	1%	0%	0%	0%	2%	0%	0%	0%
Turn Type	Perm		Prot	Prot			Perm		Perm	Perm		
Protected Phases		4	4	3	8			2			6	
Permitted Phases	4						2		2	6		
Actuated Green, G (s)	30.3	30.3	12.4	46.7				9.0	9.0	9.0		
Effective Green, g (s)	30.3	30.3	12.4	46.7				9.0	9.0	9.0		
Actuated g/C Ratio	0.48	0.48	0.19	0.73				0.14	0.14	0.14		
Clearance Time (s)	4.0	4.0	4.0	4.0				4.0	4.0	4.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0				3.0	3.0	3.0		
Lane Grp Cap (vph)	883	768	345	1378			200	218	255			
v/s Ratio Prot		0.01	c0.12	0.24								
v/s Ratio Perm		c0.40					c0.05	0.03	0.00			
v/c Ratio	0.84	0.03	0.60	0.33			0.32	0.22	0.02			
Uniform Delay, d1	14.5	8.9	23.4	3.0			24.6	24.2	23.6			
Progression Factor	1.00	1.00	1.00	1.00			1.00	1.00	1.00			
Incremental Delay, d2	6.9	0.0	2.8	0.1			0.9	0.5	0.0			
Delay (s)	21.4	8.9	26.2	3.1			25.5	24.7	23.6			
Level of Service	C	A	C	A			C	C	C			
Approach Delay (s)	20.9			10.4			24.9		23.6			
Approach LOS	C			B			C		C			
<b>Intersection Summary</b>												
HCM Average Control Delay	18.0				HCM Level of Service				B			
HCM Volume to Capacity ratio	0.69											
Actuated Cycle Length (s)	63.7				Sum of lost time (s)				12.0			
Intersection Capacity Utilization	76.1%				ICU Level of Service				D			
Analysis Period (min)	15											
c Critical Lane Group												



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑ ↗	↑ ↘	↑ ↗	↑ ↘	↑ ↗	↑ ↘
Volume (veh/h)	430	464	264	116	189	254
Sign Control	Free	Free			Stop	
Grade	0%	0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	494	533	303	133	217	292
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None	TWLTL				
Median storage veh		2				
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	437			1825	303	
vC1, stage 1 conf vol				303		
vC2, stage 2 conf vol				1522		
vCu, unblocked vol	437			1825	303	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)				5.4		
tF (s)	2.2			3.5	3.3	
p0 queue free %	56			0	61	
cM capacity (veh/h)	1134			109	741	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	494	533	303	133	217	292
Volume Left	494	0	0	0	217	0
Volume Right	0	0	0	133	0	292
cSH	1134	1700	1700	1700	109	741
Volume to Capacity	0.44	0.31	0.18	0.08	1.99	0.39
Queue Length 95th (ft)	56	0	0	0	451	47
Control Delay (s)	10.6	0.0	0.0	0.0	543.3	13.0
Lane LOS	B				F	B
Approach Delay (s)	5.1		0.0		239.2	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			64.4			
Intersection Capacity Utilization		58.2%		ICU Level of Service		B
Analysis Period (min)		15				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	393	141	2	238	0	147	0	3	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	1	452	162	2	274	0	169	0	3	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	274			614			813	813	533	817	894	274
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	274			614			813	813	533	817	894	274
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			43	100	99	100	100	100
cM capacity (veh/h)	1301			975			299	314	551	295	282	770
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	615	276	172	0								
Volume Left	1	2	169	0								
Volume Right	162	0	3	0								
cSH	1301	975	301	1700								
Volume to Capacity	0.00	0.00	0.57	0.00								
Queue Length 95th (ft)	0	0	83	0								
Control Delay (s)	0.0	0.1	31.8	0.0								
Lane LOS	A	A	D	A								
Approach Delay (s)	0.0	0.1	31.8	0.0								
Approach LOS			D	A								
Intersection Summary												
Average Delay			5.2									
Intersection Capacity Utilization		44.9%		ICU Level of Service					A			
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	97	278	3	2	200	78	3	0	0	99	0	50
Sign Control		Free				Free			Stop			Stop
Grade		0%				0%			0%			0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	103	296	3	2	213	83	3	0	0	105	0	53
Pedestrians						1						
Lane Width (ft)						12.0						
Walking Speed (ft/s)						4.0						
Percent Blockage						0						
Right turn flare (veh)												
Median type			None			None						
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	296			299			815	804	298	763	764	254
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	296			299			815	804	298	763	764	254
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.4
p0 queue free %	92			100			99	100	100	65	100	93
cM capacity (veh/h)	1249			1274			260	292	745	299	308	770
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	402	298	3	159								
Volume Left	103	2	3	105								
Volume Right	3	83	0	53								
cSH	1249	1274	260	376								
Volume to Capacity	0.08	0.00	0.01	0.42								
Queue Length 95th (ft)	7	0	1	51								
Control Delay (s)	2.7	0.1	19.0	21.4								
Lane LOS	A	A	C	C								
Approach Delay (s)	2.7	0.1	19.0	21.4								
Approach LOS			C	C								
Intersection Summary												
Average Delay			5.3									
Intersection Capacity Utilization		53.3%		ICU Level of Service					A			
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↓		↑	↑↓			↔		↑	↑	↑
Volume (vph)	218	646	0	1	503	130	0	0	0	97	0	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0						4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95						1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00						1.00	1.00
Frt	1.00	1.00		1.00	0.97						1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00						0.95	1.00
Satd. Flow (prot)	1805	3610		1803	3409						1752	1615
Flt Permitted	0.95	1.00		0.95	1.00						0.76	1.00
Satd. Flow (perm)	1805	3610		1803	3409						1397	1615
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	253	751	0	1	585	151	0	0	0	113	0	152
RTOR Reduction (vph)	0	0	0	0	22	0	0	0	0	0	0	79
Lane Group Flow (vph)	253	751	0	1	714	0	0	0	0	0	113	73
Confl. Peds. (#/hr)			3	3								
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	0%	0%	0%	2%	3%	0%	0%	0%	3%	0%	0%
Turn Type	Prot			Prot			Perm			Perm		pm+ov
Protected Phases	7	4		3	8		2			6		7
Permitted Phases						2			6			6
Actuated Green, G (s)	14.3	36.1		0.9	22.7						8.4	22.7
Effective Green, g (s)	14.3	36.1		0.9	22.7						8.4	22.7
Actuated g/C Ratio	0.25	0.63		0.02	0.40						0.15	0.40
Clearance Time (s)	4.0	4.0		4.0	4.0						4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)	450	2270		28	1348						204	751
v/s Ratio Prot	c0.14	0.21		0.00	c0.21							0.02
v/s Ratio Perm											c0.08	0.02
v/c Ratio	0.56	0.33		0.04	0.53						0.55	0.10
Uniform Delay, d1	18.8	5.0		27.8	13.3						22.8	10.9
Progression Factor	1.00	1.00		1.00	1.00						1.00	1.00
Incremental Delay, d2	1.6	0.1		0.5	0.4						3.2	0.1
Delay (s)	20.4	5.1		28.3	13.6						26.0	11.0
Level of Service	C	A		C	B						C	B
Approach Delay (s)		8.9			13.7			0.0				17.4
Approach LOS		A			B			A				B

#### Intersection Summary

HCM Average Control Delay	11.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	57.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘	↗ ↙	↑ ↗	↑ ↗ ↘	↑ ↗ ↘	↗ ↙	↗ ↙	↑ ↗	↗ ↙	↑ ↗	↗ ↙
Volume (vph)	41	431	288	39	296	8	290	29	96	11	17	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.88		1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1900	1599	1805	3559		1785	1681		1805	1721	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.73	1.00		0.67	1.00	
Satd. Flow (perm)	1805	1900	1599	1805	3559		1370	1681		1281	1721	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	42	444	297	40	305	8	299	30	99	11	18	25
RTOR Reduction (vph)	0	0	180	0	2	0	0	65	0	0	16	0
Lane Group Flow (vph)	42	444	117	40	311	0	299	64	0	11	27	0
Confl. Peds. (#/hr)	2					2	2					2
Heavy Vehicles (%)	0%	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot		Perm	Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	3.8	21.3	21.3	2.4	19.9		18.5	18.5		18.5	18.5	
Effective Green, g (s)	3.8	21.3	21.3	2.4	19.9		18.5	18.5		18.5	18.5	
Actuated g/C Ratio	0.07	0.39	0.39	0.04	0.37		0.34	0.34		0.34	0.34	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	127	747	628	80	1307		468	574		437	587	
v/s Ratio Prot	c0.02	c0.23		0.02	0.09			0.04			0.02	
v/s Ratio Perm			0.07				c0.22			0.01		
v/c Ratio	0.33	0.59	0.19	0.50	0.24		0.64	0.11		0.03	0.05	
Uniform Delay, d1	24.0	13.0	10.8	25.3	11.9		15.0	12.2		11.9	11.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	1.3	0.1	4.8	0.1		2.9	0.1		0.0	0.0	
Delay (s)	25.5	14.3	10.9	30.2	12.0		17.9	12.3		11.9	12.0	
Level of Service	C	B	B	C	B		B	B		B	B	
Approach Delay (s)		13.6			14.0			16.2			12.0	
Approach LOS		B			B			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			14.3				HCM Level of Service			B		
HCM Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			54.2				Sum of lost time (s)			8.0		
Intersection Capacity Utilization			58.8%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	84	88	306	202	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	3	97	101	352	232	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				358		
pX, platoon unblocked	0.87					
vC, conflicting volume	789	235	238			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	684	235	238			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	88	92			
cM capacity (veh/h)	336	809	1329			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	100	101	352	238		
Volume Left	3	101	0	0		
Volume Right	97	0	0	6		
cSH	772	1329	1700	1700		
Volume to Capacity	0.13	0.08	0.21	0.14		
Queue Length 95th (ft)	11	6	0	0		
Control Delay (s)	10.4	7.9	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	10.4	1.8		0.0		
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			2.3			
Intersection Capacity Utilization		31.2%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑	↑	↑	↑	↑
Volume (vph)	105	214	90	110	139	53	69	289	171	93	371	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.96	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1802		1735	1788		1805	1881	1556	1799	1881	1579
Flt Permitted	0.54	1.00		0.33	1.00		0.26	1.00	1.00	0.39	1.00	1.00
Satd. Flow (perm)	1019	1802		605	1788		501	1881	1556	742	1881	1579
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	124	252	106	129	164	62	81	340	201	109	436	85
RTOR Reduction (vph)	0	21	0	0	19	0	0	0	137	0	0	58
Lane Group Flow (vph)	124	337	0	129	207	0	81	340	64	109	436	27
Confl. Peds. (#/hr)				1	1				12	12		
Confl. Bikes (#/hr)				3			1		1			2
Heavy Vehicles (%)	0%	0%	0%	4%	1%	2%	0%	1%	0%	0%	1%	0%
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	21.6	17.4		21.6	17.4		23.6	19.4	19.4	23.6	19.4	19.4
Effective Green, g (s)	21.6	17.4		21.6	17.4		23.6	19.4	19.4	23.6	19.4	19.4
Actuated g/C Ratio	0.35	0.28		0.35	0.28		0.39	0.32	0.32	0.39	0.32	0.32
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	414	512		291	508		283	596	493	359	596	501
v/s Ratio Prot	0.02	c0.19		c0.03	0.12		0.02	0.18	c0.02	c0.23		
v/s Ratio Perm	0.09			0.13			0.09		0.04	0.10		0.02
v/c Ratio	0.30	0.66		0.44	0.41		0.29	0.57	0.13	0.30	0.73	0.05
Uniform Delay, d1	13.8	19.3		14.3	17.7		12.9	17.4	14.9	12.6	18.6	14.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	3.0		1.1	0.5		0.6	1.3	0.1	0.5	4.6	0.0
Delay (s)	14.2	22.3		15.4	18.3		13.4	18.7	15.0	13.1	23.2	14.6
Level of Service	B	C		B	B		B	B	B	B	C	B
Approach Delay (s)		20.2			17.2			16.8			20.3	
Approach LOS		C			B			B			C	

#### Intersection Summary

HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	61.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (vph)	279	67	327	314	78	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	1615	1845	1569	1805	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.30	1.00
Satd. Flow (perm)	1787	1615	1845	1569	572	1881
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	344	83	404	388	96	258
RTOR Reduction (vph)	0	47	0	251	0	0
Lane Group Flow (vph)	344	36	404	137	96	258
Confl. Bikes (#/hr)				8		
Heavy Vehicles (%)	1%	0%	3%	0%	0%	1%
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	18.4	18.4	20.8	20.8	31.4	31.4
Effective Green, g (s)	18.4	18.4	20.8	20.8	31.4	31.4
Actuated g/C Ratio	0.31	0.31	0.35	0.35	0.53	0.53
Clearance Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	559	505	653	555	423	1004
v/s Ratio Prot	c0.19		c0.22		0.02	c0.14
v/s Ratio Perm		0.02		0.09	0.10	
v/c Ratio	0.62	0.07	0.62	0.25	0.23	0.26
Uniform Delay, d1	17.2	14.2	15.7	13.5	7.9	7.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.1	1.8	0.2	0.3	0.1
Delay (s)	19.2	14.3	17.5	13.7	8.2	7.5
Level of Service	B	B	B	B	A	A
Approach Delay (s)	18.2		15.6		7.7	
Approach LOS	B		B		A	
Intersection Summary						
HCM Average Control Delay		14.6		HCM Level of Service		B
HCM Volume to Capacity ratio		0.59				
Actuated Cycle Length (s)		58.8		Sum of lost time (s)		14.0
Intersection Capacity Utilization		48.7%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

Appendix L Mitigations at NE 199<sup>th</sup>  
Avenue/NE 58<sup>th</sup> Street (SR 500)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↖	↙	↖	↗
Volume (veh/h)	59	254	22	204	312	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	69	295	26	237	363	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		364		357	69	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		364		357	69	
tC, single (s)		4.1		6.4	7.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	4.2	
p0 queue free %		98		42	99	
cM capacity (veh/h)		1206		624	778	
Direction, Lane #	EB 1	EB 2	WB 1	NB 1		
Volume Total	69	295	263	371		
Volume Left	0	0	26	363		
Volume Right	0	295	0	8		
cSH	1700	1700	1206	627		
Volume to Capacity	0.04	0.17	0.02	0.59		
Queue Length 95th (ft)	0	0	2	97		
Control Delay (s)	0.0	0.0	1.0	18.7		
Lane LOS			A	C		
Approach Delay (s)	0.0		1.0	18.7		
Approach LOS				C		
<b>Intersection Summary</b>						
Average Delay			7.2			
Intersection Capacity Utilization		43.0%		ICU Level of Service		A
Analysis Period (min)		15				

## PM 2029 Total Traffic Conditions - Mitigated

101: NE 58th St &amp; NE 199th Ave

11/18/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗		↖	↖	
Volume (veh/h)	177	329	26	109	278	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	195	362	29	120	305	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		556		371	195	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		556		371	195	
tC, single (s)		4.1		6.4	6.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	3.3	
p0 queue free %		97		50	96	
cM capacity (veh/h)		1025		612	852	
Direction, Lane #	EB 1	EB 2	WB 1	NB 1		
Volume Total	195	362	148	338		
Volume Left	0	0	29	305		
Volume Right	0	362	0	33		
cSH	1700	1700	1025	629		
Volume to Capacity	0.11	0.21	0.03	0.54		
Queue Length 95th (ft)	0	0	2	80		
Control Delay (s)	0.0	0.0	1.9	17.2		
Lane LOS			A	C		
Approach Delay (s)	0.0		1.9	17.2		
Approach LOS				C		
<b>Intersection Summary</b>						
Average Delay			5.8			
Intersection Capacity Utilization		43.7%		ICU Level of Service		A
Analysis Period (min)		15				

## Appendix M Proportion Share Calculations at NE 192<sup>nd</sup> Avenue/NE 13<sup>th</sup> Street

### Proposed Proportionate Share Contribution at NE 192nd Avenue/NE 13th Avenue

#### Cost Estimate:

Item	Unit Cost	Length	Cost	Notes
Northbound right-turn lane and westbound right-turn lane	\$ 280,000	1	\$ 280,000	Cost estimate attached.
		Total	\$ 280,000	

*Note: Cost estimate may not account for all ROW impacts*

#### Proportionate Share Calculation:

Intersection volume without development (2029 Background Scenario)	2208	
Intersection volume with development (2029 Total Traffic Scenario)	2524	
Trips added by development (2524-2208)	316	
Intersection Capacity without Improvement (2018 Background Scenario)	1808	<i>Note: without improvement, intersection operates within standards under 2018 background conditions</i>
Additional volume accommodated with improvements (2524-1808)	716	<i>Note: with proposed improvements, intersection operates within standards under 2029 total traffic conditions</i>
Proportionate share cost per trip (\$280,000/716)	\$ 391	
Proportionate share of capacity used by development (316/716)	0.441	
Proposed proportionate share contribution (\$391 per trip * 316 trips)	\$ 123,600	

# OLSON ENGINEERING INC.

1111 BROADWAY, VANCOUVER, WA 98660 (360) 695-1385

## Green Mtn. - Right Turn Lane @ NE 192nd Avenue & NE 13th Street - Cost Estimate (Option I) North Bound Right & West Bound Right

Item #	Description	Unit Of Measure	Quantity	Unit Price	Total Price
<b>GENERAL CONDITIONS</b>					
1	Mobilization	LS	1	\$ 10,000.00	\$ 10,000.00
2	Clearing & Grubbing (Remove Hedge & Trees, etc.)	LS	1	\$ 2,400.00	\$ 2,400.00
3	Stripping 6" & Haul Off	CY	235	\$ 9.00	\$ 2,115.00
				Total	\$ 14,515.00
<b>DEMOLITION</b>					
4	AC Removal (Exist'g Edge Road & Exist'g Driveways To Ba	SF	2,070	\$ 1.00	\$ 2,070.00
5	Remove Exist'g Driveway Culvert (24 LF)	LS	1	\$ 300.00	\$ 300.00
6	Relocate Exist'g Mail Boxes	EA	5	\$ 125.00	\$ 625.00
7	Relocate Exist'g Signs	EA	3	\$ 125.00	\$ 375.00
				Total	\$ 3,370.00
<b>EROSION CONTROL</b>					
8	Silt Fence	LF	700	\$ 1.75	\$ 1,225.00
9	Hydroseed & Mulch Right - Of - Way	SF	14,000	\$ 0.30	\$ 4,200.00
10	Erosion Control Maintenance	LS	1	\$ 1,600.00	\$ 1,600.00
				Total	\$ 7,025.00
<b>SITEWORK</b>					
<u>North Bound Right &amp; West Bound Right</u>					
11	Sawcut	LF	930	\$ 2.00	\$ 1,860.00
12	Mass Grading & Haul Off	CY	480	\$ 10.00	\$ 4,800.00
13	Finish Grade	SF	6,345	\$ 0.30	\$ 1,903.50
14	Geotextile Fabric	SY	765	\$ 0.90	\$ 688.50
15	1¼"- Crushed Rock (0.85')	TN	385	\$ 20.00	\$ 7,700.00
16	Asphaltic Concrete (0.85') Class ½" 64-22 HMA	TN	410	\$ 135.00	\$ 55,350.00
17	Curb & Gutter	LF	840	\$ 10.00	\$ 8,400.00
18	Sidewalk / Pedestrian Ramp	SF	4,275	\$ 4.00	\$ 17,100.00
19	Detectable Warning Surface	SF	10	\$ 25.00	\$ 250.00
20	Driveway Drop	EA	5	\$ 25.00	\$ 125.00
21	Driveway Approach (5)	SF	560	\$ 4.50	\$ 2,520.00
22	Pedestrian/Signal Modifications	LS	1	\$ 33,000.00	\$ 33,000.00
23	Traffic Control	LS	1	\$ 10,000.00	\$ 10,000.00
				Total	\$ 143,697.00
<b>SITEWORK</b>					
<u>Pave Existing Driveways To Right - Of -Way</u>					
24	Removal AC / Gravel (Back Of Sidewalk To Right - Of - Wa	SF	1,435	\$ 1.00	\$ 1,435.00
25	Finish Grade	SF	1,435	\$ 0.30	\$ 430.50
26	Geotextile Fabric	SY	175	\$ 0.90	\$ 157.50
27	1¼"- Crushed Rock (0.67')	TN	70	\$ 20.00	\$ 1,400.00
28	Asphaltic Concrete (0.25') Class ½" 64-22 HMA	TN	30	\$ 135.00	\$ 4,050.00
				Total	\$ 7,473.00

<b>STORM</b>						
29	Stormfilter Catch Basin (2 - Cart.)	EA	2	\$ 12,000.00	\$	24,000.00
30	Infiltration Trench (50 LF)	EA	2	\$ 2,500.00	\$	5,000.00
				Total	\$	29,000.00
<b>STRIPING &amp; SIGNAGE</b>						
31	Solid Double Yellow Line	LF	470	\$ 1.00	\$	470.00
32	Solid White Line	LF	810	\$ 0.50	\$	405.00
33	White Thermoplastic Stop Bar (Extend Existing)	EA	1	\$ 660.00	\$	660.00
34	Crosswalk Marking (Extend Existing)	EA	1	\$ 750.00	\$	750.00
				Total	\$	2,285.00
 Subtotal Construction Costs						
Soft Cost (20%)						
Contingency (15%)						
<hr/> <b>Total Construction Costs</b>						
					\$	207,365.00
					\$	41,473.00
					\$	31,104.75
					\$	<b>279,942.75</b>

## Appendix N Phase 1 Access Operations Worksheets



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑		↑	↑
Volume (veh/h)	72	18	171	24	6	196
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	85	21	201	28	7	231
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	460	215		229		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	460	215		229		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	85	97		99		
cM capacity (veh/h)	560	830		1351		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	85	21	229	7	231	
Volume Left	85	0	0	7	0	
Volume Right	0	21	28	0	0	
cSH	560	830	1700	1351	1700	
Volume to Capacity	0.15	0.03	0.13	0.01	0.14	
Queue Length 95th (ft)	13	2	0	0	0	
Control Delay (s)	12.6	9.5	0.0	7.7	0.0	
Lane LOS	B	A		A		
Approach Delay (s)	11.9		0.0	0.2		
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			2.3			
Intersection Capacity Utilization		21.1%		ICU Level of Service		A
Analysis Period (min)			15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	24	6	189	8	2	266
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	28	7	222	9	2	313
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	545	227		232		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	545	227		232		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	94	99		100		
cM capacity (veh/h)	502	817		1348		
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	35	232	2	313		
Volume Left	28	0	2	0		
Volume Right	7	9	0	0		
cSH	544	1700	1348	1700		
Volume to Capacity	0.06	0.14	0.00	0.18		
Queue Length 95th (ft)	5	0	0	0		
Control Delay (s)	12.1	0.0	7.7	0.0		
Lane LOS	B		A			
Approach Delay (s)	12.1	0.0	0.1			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.8			
Intersection Capacity Utilization		24.0%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖ ↗ ↘ ↗ ↖ ↘ ↗	↖ ↗ ↘ ↗ ↖ ↘ ↗	↖ ↗ ↘ ↗ ↖ ↘ ↗	↖ ↗ ↘ ↗ ↖ ↘ ↗	↖ ↗ ↘ ↗ ↖ ↘ ↗	↖ ↗ ↘ ↗ ↖ ↘ ↗
Volume (veh/h)	48	12	153	81	20	165
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	56	14	180	95	24	194
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	469	228		275		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	469	228		275		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	90	98		98		
cM capacity (veh/h)	546	817		1299		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	56	14	275	24	194	
Volume Left	56	0	0	24	0	
Volume Right	0	14	95	0	0	
cSH	546	817	1700	1299	1700	
Volume to Capacity	0.10	0.02	0.16	0.02	0.11	
Queue Length 95th (ft)	9	1	0	1	0	
Control Delay (s)	12.3	9.5	0.0	7.8	0.0	
Lane LOS	B	A		A		
Approach Delay (s)	11.8		0.0	0.8		
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			1.8			
Intersection Capacity Utilization		26.6%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Volume (veh/h)	16	4	230	27	7	206
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	4	250	29	8	224
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	504	265		279		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	504	265		279		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	97	99		99		
cM capacity (veh/h)	525	774		1283		
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	22	279	8	224		
Volume Left	17	0	8	0		
Volume Right	4	29	0	0		
cSH	561	1700	1283	1700		
Volume to Capacity	0.04	0.16	0.01	0.13		
Queue Length 95th (ft)	3	0	0	0		
Control Delay (s)	11.7	0.0	7.8	0.0		
Lane LOS	B		A			
Approach Delay (s)	11.7	0.0	0.3			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.6			
Intersection Capacity Utilization		23.7%		ICU Level of Service		A
Analysis Period (min)		15				

## Appendix O Full Build-Out Access Operations Worksheets



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑		↑	↑
Volume (veh/h)	52	20	303	16	6	270
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	61	24	356	19	7	318
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	698	366		375		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	698	366		375		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	85	97		99		
cM capacity (veh/h)	407	684		1194		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total	61	24	375	325		
Volume Left	61	0	0	7		
Volume Right	0	24	19	0		
cSH	407	684	1700	1194		
Volume to Capacity	0.15	0.03	0.22	0.01		
Queue Length 95th (ft)	13	3	0	0		
Control Delay (s)	15.4	10.5	0.0	0.2		
Lane LOS	C	B		A		
Approach Delay (s)	14.0		0.0	0.2		
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			1.6			
Intersection Capacity Utilization		29.0%		ICU Level of Service		A
Analysis Period (min)			15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	2	87	0	33	1	286	27	10	312	1
Sign Control		Stop				Stop			Free		Free	
Grade		0%				0%			0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	0	2	102	0	39	1	336	32	12	367	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None		None		
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	785	762	368	748	746	352	368			368		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	785	762	368	748	746	352	368			368		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	69	100	94	100			99		
cM capacity (veh/h)	293	334	682	327	340	696	1201			1201		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	4	141	369	380								
Volume Left	1	102	1	12								
Volume Right	2	39	32	1								
cSH	473	383	1201	1201								
Volume to Capacity	0.01	0.37	0.00	0.01								
Queue Length 95th (ft)	1	42	0	1								
Control Delay (s)	12.7	19.8	0.0	0.3								
Lane LOS	B	C	A	A								
Approach Delay (s)	12.7	19.8	0.0	0.3								
Approach LOS	B	C										
<b>Intersection Summary</b>												
Average Delay			3.3									
Intersection Capacity Utilization		44.0%		ICU Level of Service				A				
Analysis Period (min)			15									



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Volume (veh/h)	17	7	306	5	2	397
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	20	8	360	6	2	467
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	835	363		366		
vC1, stage 1 conf vol	363					
vC2, stage 2 conf vol	472					
vCu, unblocked vol	835	363		366		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3		2.2		
p0 queue free %	96	99		100		
cM capacity (veh/h)	542	686		1204		
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	28	366	2	467		
Volume Left	20	0	2	0		
Volume Right	8	6	0	0		
cSH	578	1700	1204	1700		
Volume to Capacity	0.05	0.22	0.00	0.27		
Queue Length 95th (ft)	4	0	0	0		
Control Delay (s)	11.6	0.0	8.0	0.0		
Lane LOS	B		A			
Approach Delay (s)	11.6	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.4			
Intersection Capacity Utilization		30.9%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑		↑	↑
Volume (veh/h)	157	59	253	48	18	396
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	185	69	298	56	21	466
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh)			2		2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	834	326		354		
vC1, stage 1 conf vol	326					
vC2, stage 2 conf vol	508					
vCu, unblocked vol	834	326		354		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3		2.2		
p0 queue free %	65	90		98		
cM capacity (veh/h)	531	720		1216		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	185	69	354	21	466	
Volume Left	185	0	0	21	0	
Volume Right	0	69	56	0	0	
cSH	531	720	1700	1216	1700	
Volume to Capacity	0.35	0.10	0.21	0.02	0.27	
Queue Length 95th (ft)	39	8	0	1	0	
Control Delay (s)	15.4	10.5	0.0	8.0	0.0	
Lane LOS	C	B		A		
Approach Delay (s)	14.0		0.0	0.3		
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			3.4			
Intersection Capacity Utilization		36.2%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	35	13	289	11	4	549
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	41	15	340	13	5	646
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh)			2		2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1002	346		353		
vC1, stage 1 conf vol	346					
vC2, stage 2 conf vol	655					
vCu, unblocked vol	1002	346		353		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3		2.2		
p0 queue free %	91	98		100		
cM capacity (veh/h)	466	701		1217		
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	56	353	5	646		
Volume Left	41	0	5	0		
Volume Right	15	13	0	0		
cSH	513	1700	1217	1700		
Volume to Capacity	0.11	0.21	0.00	0.38		
Queue Length 95th (ft)	9	0	0	0		
Control Delay (s)	12.9	0.0	8.0	0.0		
Lane LOS	B		A			
Approach Delay (s)	12.9	0.0	0.1			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.7			
Intersection Capacity Utilization		38.9%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	9	290	3	17	567
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	4	11	341	4	20	667
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh)			2		2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1050	343		345		
vC1, stage 1 conf vol		343				
vC2, stage 2 conf vol		707				
vCu, unblocked vol	1050	343		345		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)		5.4				
tF (s)		3.5	3.3		2.2	
p0 queue free %	99	98		98		
cM capacity (veh/h)	441	704		1226		
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	14	345	20	667		
Volume Left	4	0	20	0		
Volume Right	11	4	0	0		
cSH	613	1700	1226	1700		
Volume to Capacity	0.02	0.20	0.02	0.39		
Queue Length 95th (ft)	2	0	1	0		
Control Delay (s)	11.0	0.0	8.0	0.0		
Lane LOS	B		A			
Approach Delay (s)	11.0	0.0	0.2			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization		39.8%		ICU Level of Service		A
Analysis Period (min)			15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	10	3	290	10	6	565
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	12	4	341	12	7	665
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh						2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1026	347		353		
vC1, stage 1 conf vol		347				
vC2, stage 2 conf vol		679				
vCu, unblocked vol	1026	347		353		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)		5.4				
tF (s)		3.5	3.3		2.2	
p0 queue free %		97	99		99	
cM capacity (veh/h)	456	701		1217		
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	15	353	7	665		
Volume Left	12	0	7	0		
Volume Right	4	12	0	0		
cSH	496	1700	1217	1700		
Volume to Capacity	0.03	0.21	0.01	0.39		
Queue Length 95th (ft)	2	0	0	0		
Control Delay (s)	12.5	0.0	8.0	0.0		
Lane LOS	B		A			
Approach Delay (s)	12.5	0.0	0.1			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.2			
Intersection Capacity Utilization		39.7%		ICU Level of Service		A
Analysis Period (min)			15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑	↑	↑		↑	↑
Volume (veh/h)	30	202	448	45	28	70
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	35	238	527	53	33	82
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL	None				
Median storage veh		2				
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	580			862	554	
vC1, stage 1 conf vol				554		
vC2, stage 2 conf vol				308		
vCu, unblocked vol	580			862	554	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)				5.4		
tF (s)	2.2			3.5	3.3	
p0 queue free %	96			94	85	
cM capacity (veh/h)	1004			514	536	
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	35	238	580	33	82	
Volume Left	35	0	0	33	0	
Volume Right	0	0	53	0	82	
cSH	1004	1700	1700	514	536	
Volume to Capacity	0.04	0.14	0.34	0.06	0.15	
Queue Length 95th (ft)	3	0	0	5	13	
Control Delay (s)	8.7	0.0	0.0	12.5	12.9	
Lane LOS	A			B	B	
Approach Delay (s)	1.1		0.0	12.8		
Approach LOS				B		
<b>Intersection Summary</b>						
Average Delay			1.8			
Intersection Capacity Utilization		37.3%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	27	204	407	5	17	86
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	32	240	479	6	20	101
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	485			785	482	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	485			785	482	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	97			94	83	
cM capacity (veh/h)	1089			353	589	
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	272	485	20	101		
Volume Left	32	0	20	0		
Volume Right	0	6	0	101		
cSH	1089	1700	353	589		
Volume to Capacity	0.03	0.29	0.06	0.17		
Queue Length 95th (ft)	2	0	4	15		
Control Delay (s)	1.2	0.0	15.8	12.4		
Lane LOS	A		C	B		
Approach Delay (s)	1.2	0.0	12.9			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay		2.2				
Intersection Capacity Utilization		43.4%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑		↑	↑
Volume (veh/h)	30	11	281	53	20	335
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	35	13	331	62	24	394
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	803	362		393		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	803	362		393		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	90	98		98		
cM capacity (veh/h)	348	687		1177		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total	35	13	393	418		
Volume Left	35	0	0	24		
Volume Right	0	13	62	0		
cSH	348	687	1700	1177		
Volume to Capacity	0.10	0.02	0.23	0.02		
Queue Length 95th (ft)	8	1	0	2		
Control Delay (s)	16.5	10.3	0.0	0.7		
Lane LOS	C	B		A		
Approach Delay (s)	14.8		0.0	0.7		
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			1.2			
Intersection Capacity Utilization		44.0%		ICU Level of Service		A
Analysis Period (min)			15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	1	50	0	19	2	316	89	33	332	1
Sign Control		Stop				Stop			Free			Free
Grade		0%				0%			0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	0	1	59	0	22	2	372	105	39	391	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	920	950	391	899	898	424	392			476		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	920	950	391	899	898	424	392			476		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	77	100	96	100			96		
cM capacity (veh/h)	238	252	662	254	271	634	1178			1096		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	2	81	479	431								
Volume Left	1	59	2	39								
Volume Right	1	22	105	1								
cSH	350	304	1178	1096								
Volume to Capacity	0.01	0.27	0.00	0.04								
Queue Length 95th (ft)	1	26	0	3								
Control Delay (s)	15.4	21.1	0.1	1.1								
Lane LOS	C	C	A	A								
Approach Delay (s)	15.4	21.1	0.1	1.1								
Approach LOS	C	C										
<b>Intersection Summary</b>												
Average Delay			2.3									
Intersection Capacity Utilization		54.2%		ICU Level of Service				A				
Analysis Period (min)		15										



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	10	4	402	18	7	374
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	12	5	473	21	8	440
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	940	484		494		
vC1, stage 1 conf vol	484					
vC2, stage 2 conf vol	456					
vCu, unblocked vol	940	484		494		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3		2.2		
p0 queue free %	98	99		99		
cM capacity (veh/h)	506	587		1080		
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	16	494	8	440		
Volume Left	12	0	8	0		
Volume Right	5	21	0	0		
cSH	527	1700	1080	1700		
Volume to Capacity	0.03	0.29	0.01	0.26		
Queue Length 95th (ft)	2	0	1	0		
Control Delay (s)	12.1	0.0	8.4	0.0		
Lane LOS	B		A			
Approach Delay (s)	12.1	0.0	0.2			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization		32.2%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑		↑	↑
Volume (veh/h)	89	33	386	160	60	325
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	105	39	454	188	71	382
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh)			2		2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1072	548		642		
vC1, stage 1 conf vol	548					
vC2, stage 2 conf vol	524					
vCu, unblocked vol	1072	548		642		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3		2.2		
p0 queue free %	76	93		93		
cM capacity (veh/h)	444	540		952		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	105	39	642	71	382	
Volume Left	105	0	0	71	0	
Volume Right	0	39	188	0	0	
cSH	444	540	1700	952	1700	
Volume to Capacity	0.24	0.07	0.38	0.07	0.22	
Queue Length 95th (ft)	23	6	0	6	0	
Control Delay (s)	15.6	12.2	0.0	9.1	0.0	
Lane LOS	C	B		A		
Approach Delay (s)	14.7		0.0	1.4		
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			2.2			
Intersection Capacity Utilization		48.3%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	20	7	539	36	13	400
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	8	634	42	15	471
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh)			2		2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1156	655		676		
vC1, stage 1 conf vol		655				
vC2, stage 2 conf vol		501				
vCu, unblocked vol	1156	655		676		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3		2.2		
p0 queue free %	95	98		98		
cM capacity (veh/h)	431	469		925		
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	32	676	15	471		
Volume Left	24	0	15	0		
Volume Right	8	42	0	0		
cSH	441	1700	925	1700		
Volume to Capacity	0.07	0.40	0.02	0.28		
Queue Length 95th (ft)	6	0	1	0		
Control Delay (s)	13.8	0.0	9.0	0.0		
Lane LOS	B		A			
Approach Delay (s)	13.8	0.0	0.3			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization		40.6%		ICU Level of Service		A
Analysis Period (min)			15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y		Y	Y
Volume (veh/h)	18	47	527	8	43	377
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	21	55	620	9	51	444
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh)			2		2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1169	625		629		
vC1, stage 1 conf vol		625				
vC2, stage 2 conf vol		545				
vCu, unblocked vol	1169	625		629		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3		2.2		
p0 queue free %	95	89		95		
cM capacity (veh/h)	422	489		963		
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	76	629	51	444		
Volume Left	21	0	51	0		
Volume Right	55	9	0	0		
cSH	468	1700	963	1700		
Volume to Capacity	0.16	0.37	0.05	0.26		
Queue Length 95th (ft)	14	0	4	0		
Control Delay (s)	14.2	0.0	8.9	0.0		
Lane LOS	B		A			
Approach Delay (s)	14.2	0.0	0.9			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			1.3			
Intersection Capacity Utilization		45.4%		ICU Level of Service		A
Analysis Period (min)			15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↑	↗	↙	↑
Volume (veh/h)	54	16	520	25	14	381
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	64	19	612	29	16	448
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh)			2		2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1108	626		641		
vC1, stage 1 conf vol	626					
vC2, stage 2 conf vol	481					
vCu, unblocked vol	1108	626		641		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3		2.2		
p0 queue free %	86	96		98		
cM capacity (veh/h)	446	487		953		
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	82	641	16	448		
Volume Left	64	0	16	0		
Volume Right	19	29	0	0		
cSH	455	1700	953	1700		
Volume to Capacity	0.18	0.38	0.02	0.26		
Queue Length 95th (ft)	16	0	1	0		
Control Delay (s)	14.7	0.0	8.8	0.0		
Lane LOS	B		A			
Approach Delay (s)	14.7	0.0	0.3			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			1.1			
Intersection Capacity Utilization		39.5%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑	↑	↑		↑	↑
Volume (veh/h)	98	555	298	121	82	82
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	115	653	351	142	96	96
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	493			1305	422	
vC1, stage 1 conf vol				422		
vC2, stage 2 conf vol				884		
vCu, unblocked vol	493			1305	422	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)				5.4		
tF (s)	2.2			3.5	3.3	
p0 queue free %	89			71	85	
cM capacity (veh/h)	1081			334	636	
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	115	653	493	96	96	
Volume Left	115	0	0	96	0	
Volume Right	0	0	142	0	96	
cSH	1081	1700	1700	334	636	
Volume to Capacity	0.11	0.38	0.29	0.29	0.15	
Queue Length 95th (ft)	9	0	0	29	13	
Control Delay (s)	8.7	0.0	0.0	20.1	11.7	
Lane LOS	A			C	B	
Approach Delay (s)	1.3		0.0	15.9		
Approach LOS				C		
<b>Intersection Summary</b>						
Average Delay			2.8			
Intersection Capacity Utilization		43.0%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑	↑	↑		↑	↑
Volume (veh/h)	88	548	370	17	10	49
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	104	645	435	20	12	58
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	455			1297	445	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	455			1297	445	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	91			93	91	
cM capacity (veh/h)	1116			164	617	
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	104	645	455	12	58	
Volume Left	104	0	0	12	0	
Volume Right	0	0	20	0	58	
cSH	1116	1700	1700	164	617	
Volume to Capacity	0.09	0.38	0.27	0.07	0.09	
Queue Length 95th (ft)	8	0	0	6	8	
Control Delay (s)	8.6	0.0	0.0	28.7	11.4	
Lane LOS	A			D	B	
Approach Delay (s)	1.2		0.0	14.4		
Approach LOS				B		
<b>Intersection Summary</b>						
Average Delay			1.5			
Intersection Capacity Utilization		38.8%		ICU Level of Service		A
Analysis Period (min)		15				