KITTELSON & ASSOCIATES
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Exhibit 42
SUB17-02

March 14, 2017 Project #: 19693

James E. Carothers, PE
City of Camas
616 NE 4th Avenue
Camas, WA 98607

RE: Traffic Impact Analysis for Dawson's Ridge Project – Camas, WA

Dear Curleigh,

This Traffic Impact Analysis (TIA) report has been prepared for the proposed Dawson's Ridge Project residential development along McIntosh Road in the City of Camas, WA. Pursuant to City of Camas requirements, this report includes the following:

- Operational assessment of key study intersections under existing traffic conditions;
- Review of latest three years of reported crash data at study intersections;
- Assessment of background traffic operations, including traffic associated with approved in-process developments but not the proposed development;
- Trip generation and trip distribution estimate for the proposed development;
- Assessment of future traffic conditions at study intersections and the proposed site access after full build-out and occupation of the proposed development;
- Queueing, access spacing, sight distance, and on-site circulation review; and,
- Findings and recommendations.

Based on the analysis provided and documented herein, the proposed development can be constructed without adversely impacting the surrounding transportation system, assuming provision of the following mitigation measures:

- No off-site transportation capacity or safety-related mitigations are recommended to support the proposed development, except to install appropriate stop sign control and striping at the primary access to NW McIntosh Road, across from Sacajawea Street.
- An existing private driveway near the intersection of NW McIntosh Road and NW Brady Road will remain in place, restricted to existing users and emergency access for the subdivision.
- Any new landscaping, signage, or above-ground utilities within the right-of-way or along the site frontage should be installed and maintained so that adequate sight distance is provided at the site access upon buildout.

INTRODUCTION

The Dawson's Ridge Project proposes to construct a residential development along the south side of NW McIntosh Road, east of NW Brady Road in Camas. The site is located adjacent to six ridge lots and is currently vacant and zoned for residential uses (R-15). Figures 1 and 2 illustrate the site location.

The proposed development will consist of up to 55 single family detached homes and 25 townhomes. Access to the development is proposed along NW McIntosh Road through a single full-access driveway across from NW Sacajawea Street. The existing private driveway at the intersection of NW Brady Road and NW McIntosh Road will be restricted to existing users and emergency access. Full occupancy of the development is expected to occur by 2018.

EXISTING TRAFFIC CONDITIONS

The existing conditions analysis identifies site conditions, surrounding land uses, and the current operational and geometric characteristics of roadways within the study area. The purpose of this section is to create a basis for comparison to future conditions.

Site Conditions and Adjacent Land Uses

The proposed development site is currently vacant and located adjacent to six existing ridge lots. The land uses surrounding the proposed site are primarily single family and multi-family residential neighborhoods to the east, north, and west and the Lewis and Clark Highway (SR 14) to the south. Table 1 summarizes the attributes of the key transportation facilities in the site vicinity.

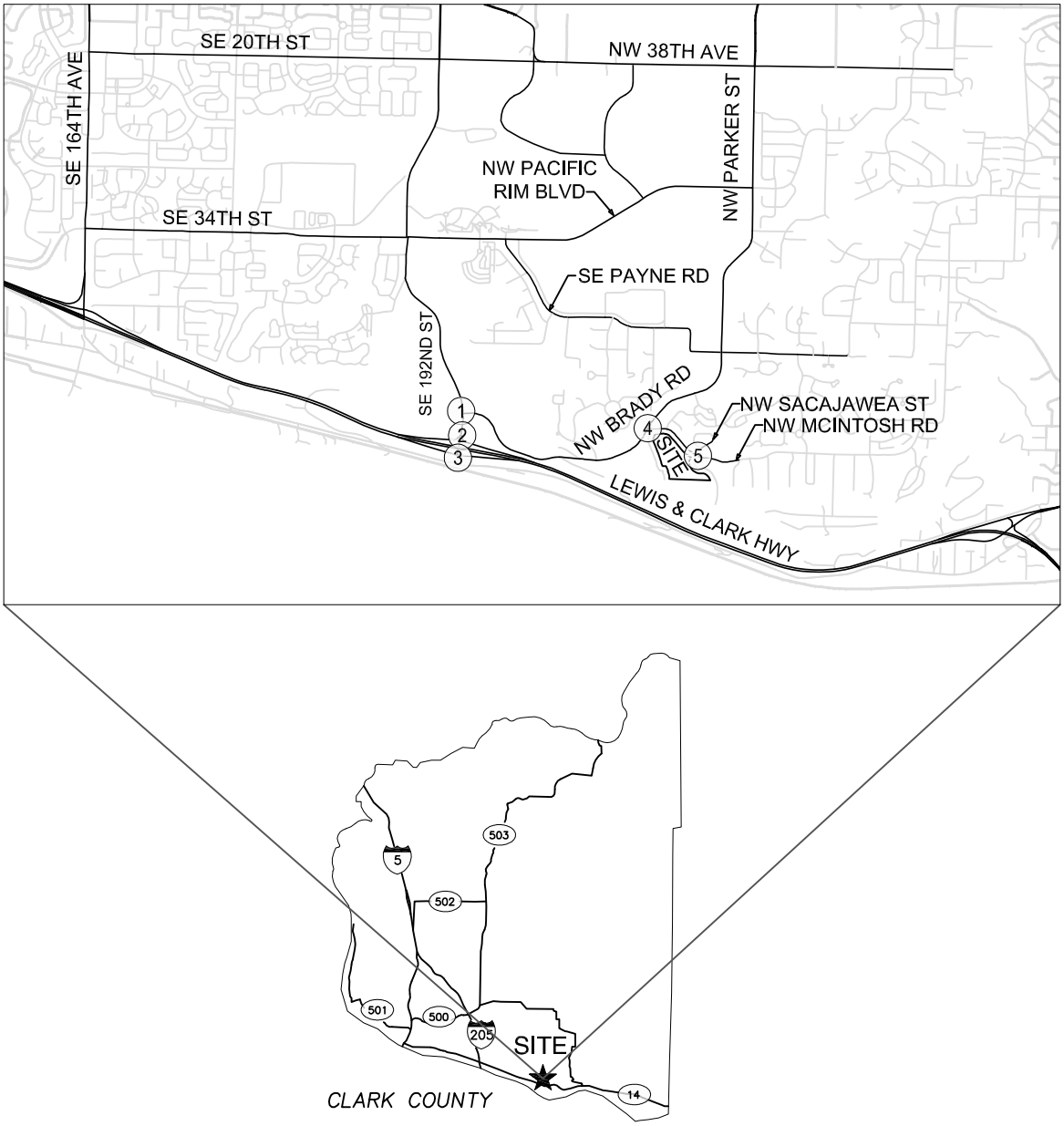
Table 1. Existing Transportation Facilities and Roadway Designations

Roadway	Functional Classification[1]	Cross Section	Posted Speed Limit	Sidewalks?	Bike Lanes?	On-street Parking?
SE 192nd Ave	Arterial	5 lanes	40 mph	Yes	Yes	No
NW Brady Rd	Arterial	2 lanes	40 mph	No	Shoulder[1]	No
SR 14	Statewide Hwy (WSDOT)	4 lanes	60 mph	No	No	No
NW McIntosh Rd	Arterial	2 lanes	35 mph	Yes	No	No

[1]A paved shoulder with fog line striping is provided on each side of the road, which can facilitate bicycle travel.

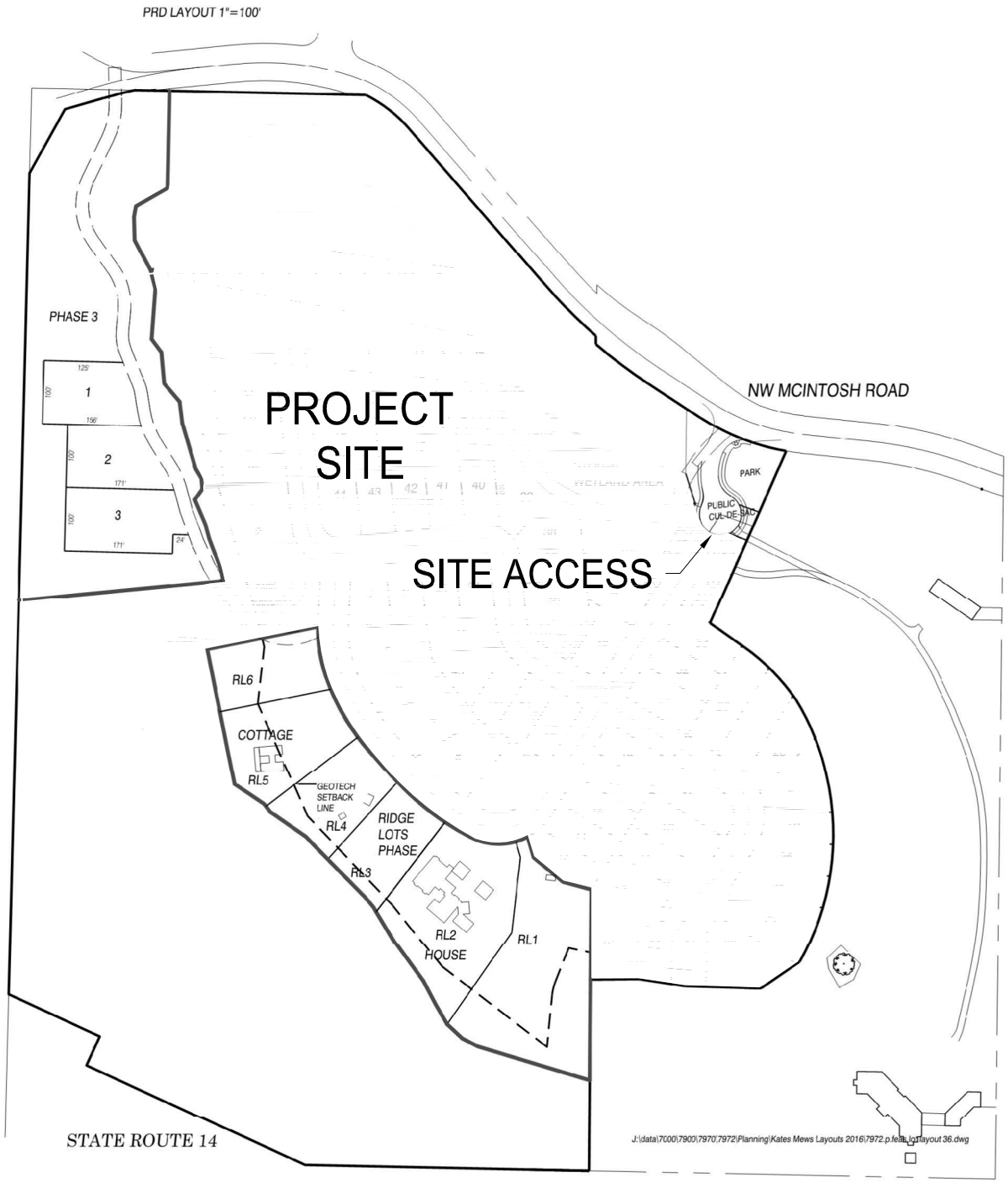
Pedestrian Facilities

Sidewalks are provided on the north side of NW McIntosh Road and portions of NW Brady Road. The sidewalks provide connection to and through the NW Vinca Lane and NW Sacajawea Street neighborhoods just north of the site, but sidewalks are not provided on McIntosh Road to the east of the proposed site or along NW Brady Road in the vicinity of the project.



Site Vicinity Map
Camas, Washington

Figure
1



SITE PLAN PROVIDED BY LUGLIANI IINVESTMENT CO. 8/10/2016

Proposed Site Plan
Camas, Washington

Figure
2

Bicycle Facilities

Bike lanes are provided only along SE 192nd Avenue, with paved shoulders present along both sides of SE Brady Road that are conducive to bicycle travel. NW McIntosh Road does not have bicycle lanes in the site vicinity.

Transit Facilities

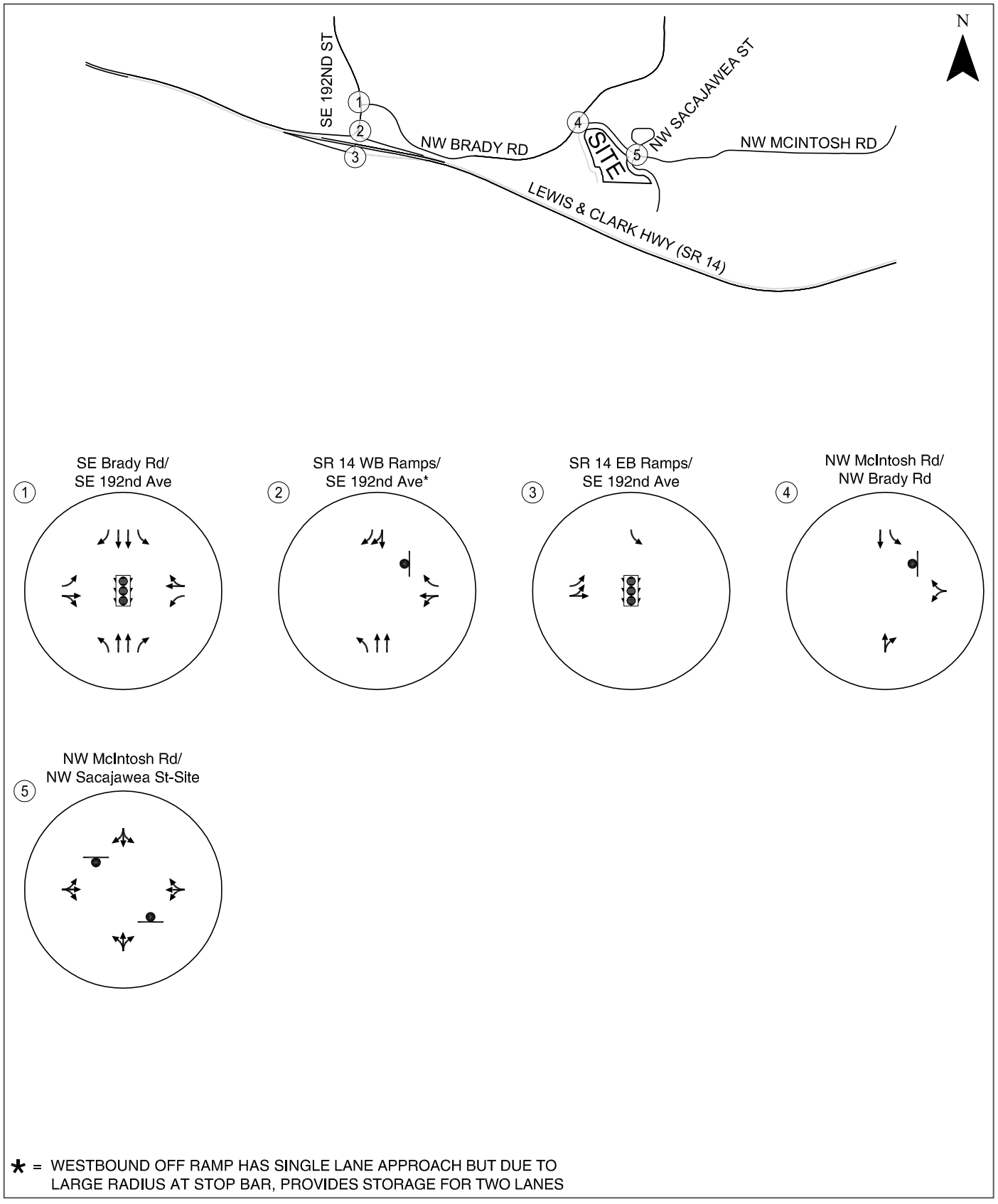
There is no public fixed-route transit service in the site vicinity. However, C-TRAN's "Connector" provides the City of Camas with fully accessible dial-a-ride (reservation based service) and scheduled stop service (no reservation required) at designated stops at Fisher's Landing Transit Center and Hiddenbrook Drive. Rides are provided on a first-come, first-served basis. Dial-a-ride services are available weekdays from 5:20-9:15 a.m. and 2:00-7:15 p.m. No holiday Connector service is provided.

Study Intersections

Based on the "*25 or more peak hour site trip*" impact threshold established in the City's Design Standards Manual, the following intersections were identified for analysis:

1. SE 192nd Avenue and SE Brady Road
2. SE 192nd Avenue and SR 14 WB Ramps
3. SE 192nd Avenue and SR 14 EB Ramps
4. NW Brady Road and NW McIntosh Road
5. NW McIntosh Road and NW Sacajawea Street/Site Access

All study intersections are located within the City of Camas, with the SE 192nd intersections controlled by the City of Vancouver. Traffic operations at these intersections were analyzed as part of this report under existing and future traffic conditions. A site visit was performed on a typical weekday in October 2016 to confirm all existing lane configurations, traffic control devices, and traffic operation conditions. Figure 3 illustrates the existing lane configurations and traffic control devices at each of these study intersections.



Existing Lane Configurations and Traffic Control Devices
Camas, Washington

Figure **3**

KITTELSON & ASSOCIATES

Traffic Safety Summary

The crash histories for all five study intersections addressed in the TIA were reviewed in an effort to identify potential intersection safety hazards. Crash data for the seven study intersections were obtained from the Washington Department of Transportation for the three-year period from May 1, 2013 through April 30, 2016 for the SE 192nd Ave intersections, and June 1, 2013 to May 31, 2016 for the NW McIntosh Road intersections. Table 2 summarizes the crashes reported at each study intersection. *Appendix "A" in the Traffic Impact Analysis for Dawson's Ridge Project contains the detailed WSDOT crash data.*

Table 2: Intersection Crash History Summary

Location	Crash Severity			Crash Type						Total Crashes
	Fatal	Injury	PDO[1]	Rear End	Side-swipe	Angle	Turning Movement	Fixed Object	Other	
SE 192nd Ave and SE Brady Rd	0	1	4	0	0	1	0	4	0	5
SE 192nd Ave and SR 14 EB Ramps	0	2	4	1	1	0	0	4	0	6
SE 192nd Ave and SR 14 WB Ramps	0	3	23	11	1	2	2	10	0	26
NW Brady Rd and NW McIntosh Rd	0	1	0	0	0	0	0	0	1[2]	1
NW McIntosh Rd and NW Sacajawea St/Site Access	0	0	0	0	0	0	0	0	0	0

[1]PDO – Property damage only
[2]Overturned Vehicle

As shown in Table 2, no fatal crashes occurred. The majority of crashes were rear ends and fixed object crashes, with there being slightly more fixed object crashes.

After further reviewing the rear end crashes, it was revealed that nearly all rear end crashes occurred on the WB exit ramp entering SE 192nd Avenue and resulted from a second vehicle following too closely or being inattentive. The other rear ends resulted from vehicles stopping to make a left or through movement and the second vehicle rear ending the first vehicle while attempting to make a right turn. Inattention with the stop and go movement of the intersection and 55-foot wide flared approach contributed to the high number of rear end crashes. A possible safety mitigation measure could be the addition of striping to the approach in order to direct left or through moving vehicles closer to the left and allow the dominant movement, right turning vehicles, to move through the intersection.

A majority of the fixed object crashes for the SE 192nd Avenue/ SR 14 WB Ramp occurred when vehicles made the southbound right turn movement onto the SR 14 WB entrance ramp and collided with the guardrail on the left or the concrete barrier on the right of the entrance ramp. These crashes occurred primarily when roadway surface conditions were wet and the vehicle was exceeding a reasonably safe speed. Possible safety mitigation measures that WSDOT could consider is to post advisory speed signs, introduce channelization and/or additional lane striping in advance of the turn to maintain proper tracking or reduce vehicle speeds.

Based on reviewing the crash data and site generated trips, the proposed development will generate very little traffic at the SE 192nd Avenue/ SR 14 Ramp intersections compared to existing and in process

traffic and therefore is not expected to significantly contribute to the crash characteristics of the intersection. Due to the trend of rear end and fixed object crashes at the SR 14 Ramps, it is recommended that further investigation and safety mitigation measures be conducted by either the City of Vancouver or WSDOT independent of the proposed development.

Analysis Methodology

All level of service (LOS) analysis described in this report was performed using Synchro 9 software in accordance with the procedures stated in the *2000 Highway Capacity Manual* (HCM, Reference 2). However, SimTraffic software was also used to conduct microsimulations that appropriately account for the impacts of traffic progression created by the two adjacent traffic signals on SE 192nd Avenue at SE Brady Road to the north and the SR 14 Eastbound ramp terminals to the south. Based on observations in the field, these adjacent traffic signals create gaps in the main traffic stream along SE 192nd Avenue that allow for substantial right-turn maneuvers to be made from the SR 14 westbound off-ramp. The use of a microsimulation tool like SimTraffic in this instance enables an appropriate level of analysis for this intersection by quantifying average driver delays and determining equivalent LOS ratings for the critical westbound right-turn movement as calculated from an average of 5 simulation runs.

To evaluate worst-case conditions, the peak 15-minute flow rates of the weekday a.m. and p.m. peak hours were used in the evaluation of all intersection LOS. For this reason, the operations analyses reflect conditions that are likely to occur for the peak 15 minutes out of each weekday a.m. and p.m. peak hour. Traffic conditions during other weekday hours will likely operate under better conditions than those described in this report. *A description of level-of-service criteria is contained in Appendix "B".*

Operating Standards

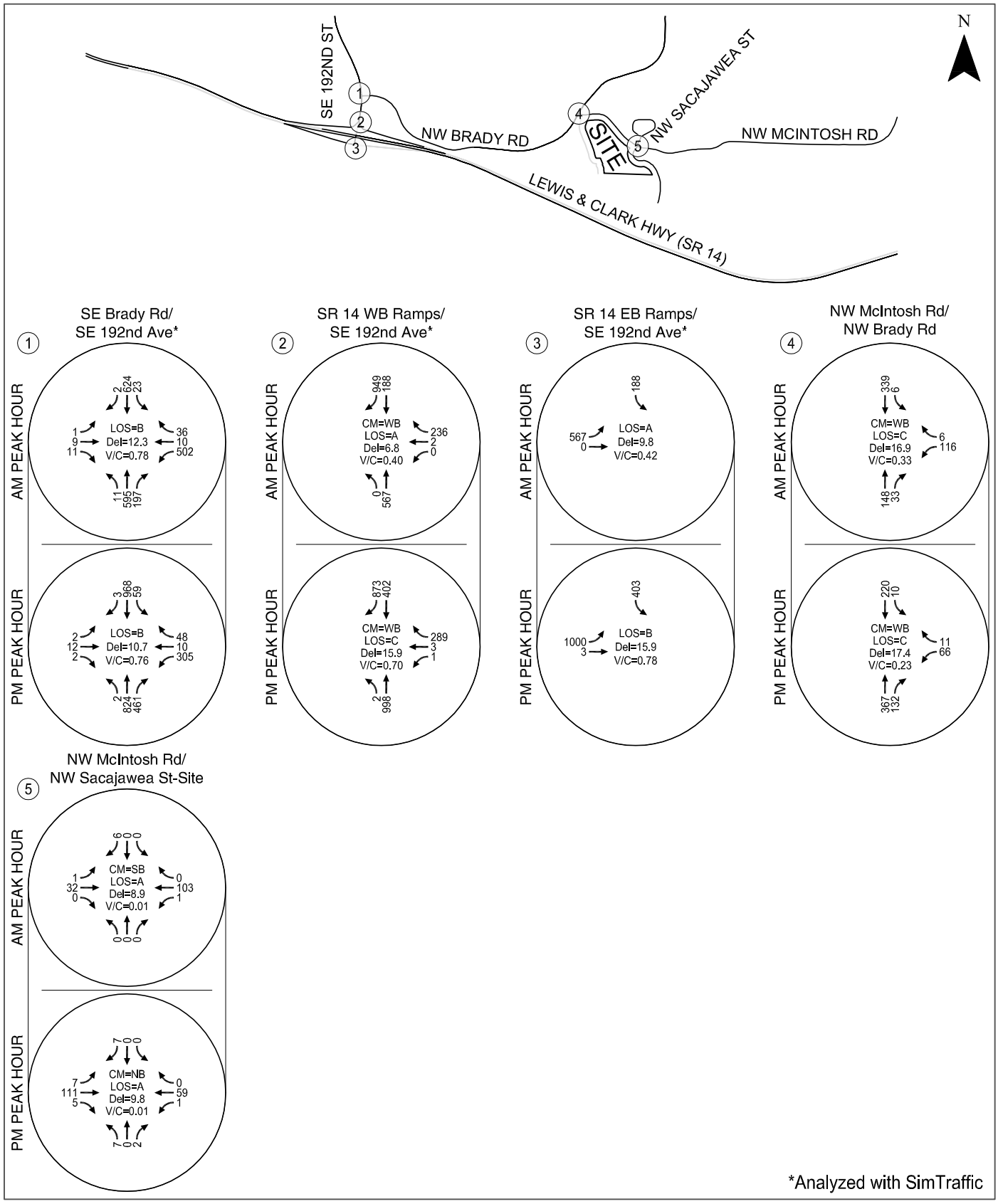
The study area roadways are subject to the following operating standards:

- City of Camas requires a LOS "D" or better and a volume-to-capacity ratio of 0.90 or less for all intersections within the city limits of Camas, which includes those study intersections east of SE 192nd Avenue.
- Vancouver Municipal Code (VMC) Section 11.80.130B requires that signalized intersections within Vancouver city limits operate at LOS "E" or better with a volume-to-capacity ratio of 0.95 or less and that unsignalized intersections maintain a volume-to-capacity ratio less than 0.95 for any lane on any approach. These standards are applicable to the intersection of SE 192nd Avenue and SE Brady Road.
- The Washington State Department of Transportation (WSDOT) requires an LOS "D" or better for the interchange ramp terminals between SR 14 and SE 192nd Avenue.

Existing Traffic Operations

Turning movement counts were obtained at the study intersections along the SE 192nd Avenue corridor on a midweek day in May 2016, with remaining study intersections along NW McIntosh Road counted on a typical weekday in October 2016. All counts were performed during the morning (7:00 to 9:00 a.m.) and evening (4:00 to 6:00 p.m.) peak periods. School was in session in the cities of Camas and Vancouver on the days the traffic counts were collected. The traffic counts revealed a local system morning peak from 7:10 to 8:10 a.m. and evening peak from 4:55 to 5:55 p.m.

Figure 4 shows the existing traffic volumes and operations at each of the study intersections during weekday a.m. and p.m. peak hours. As shown in the figure, all study intersections operate acceptably during both peak periods and meet the LOS and/or volume-to-capacity ratio standards enforced by the governing agency. *Appendix "C" includes the traffic count data, and Appendix "D" includes the existing traffic analysis worksheets.*



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = CRITICAL MOVEMENT LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL CRITICAL VOLUME-TO-CAPACITY RATIO

Existing Traffic Conditions
Weekday AM and PM Peak Hours
Camas, Washington

Figure
4

TRAFFIC IMPACT ANALYSIS

The future conditions analysis identifies how the transportation facilities within the study area will operate in the proposed project completion year of 2018. The following elements were analyzed to account for the impacts of the residential development:

- Year 2018 background traffic conditions, including traffic associated with approved in-process developments but not the proposed development;
- Trips generated by the proposed development; and
- Year 2018 total traffic conditions, assuming full build-out and occupancy of the proposed development.

Year 2018 Background Conditions

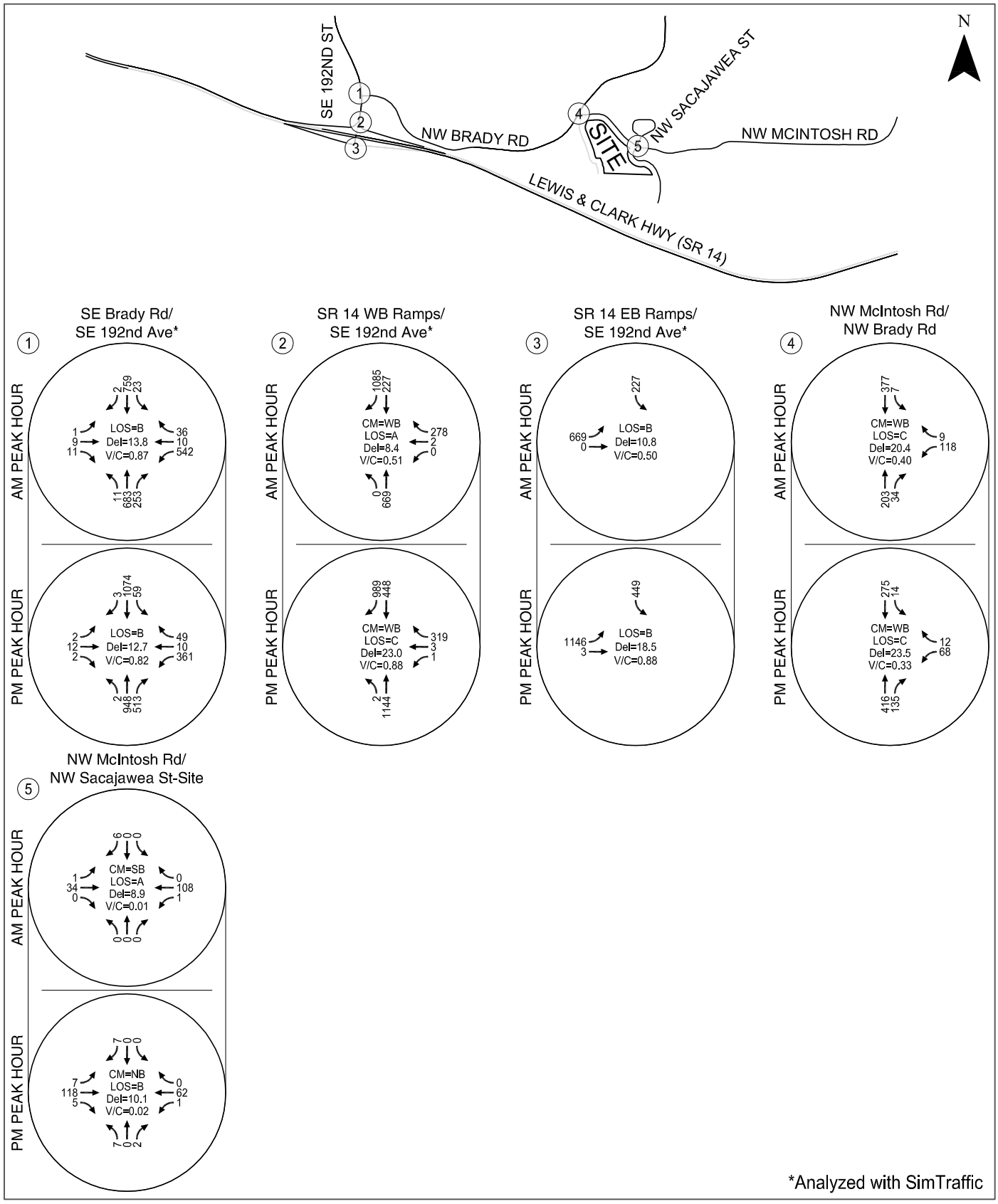
The background traffic analysis identifies how the study area's transportation system will operate in the proposed project build year with traffic growth from in-process developments within the study area, but not including the trips associated with the proposed development. The City of Camas identified the following approved in-process developments in the site vicinity that would potentially add trips to the study intersections:

- Belz Place Residential Development,
- Brady Residential Subdivision
- Fisher Creek Campus Buildings 3 and 4,
- Green Mountain Estates,
- Green Mountain Master Plan,
- Lake Hills Residential Development,
- Camas Lofts Residential Development,
- Parker Village,
- Parklands at Camas Meadows, and
- The Village at Camas Meadows.

Given the traffic volumes from multiple in-process developments and per direction from City of Camas engineering staff, no additional regional background growth rate was applied. *Appendix "E" includes the estimated in-process volumes.*

The capital improvement programs for both the cities of Camas and Vancouver were reviewed to determine if any of the study area roadways or intersections are targeted for capacity enhancements. No projects were discovered in the study area. Therefore, the existing lane configurations and traffic control devices at all study intersections are expected to remain unchanged.

Figure 5 shows the projected 2018 background traffic volumes and operations for the study intersections during the weekday a.m. and p.m. peak hours. As shown in the figure, all intersections are expected to continue operating acceptably and meet the jurisdictional standards of the governing agency. *Appendix "F" includes the 2018 background traffic analysis worksheets.*



*Analyzed with SimTraffic

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
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V/C = CRITICAL CRITICAL VOLUME-TO-CAPACITY RATIO

2018 Background Traffic Conditions
Weekday AM and PM Peak Hours
Camas, Washington

Figure
5

Proposed Development Plan

The applicant proposes to construct up to 55 single family homes and 25 condominiums/townhouses in addition to the three existing residential homes adjacent to the development site. Access is anticipated by a single full-access driveway on NW McIntosh Road. The existing private driveway at the intersection of NW Brady Road and NW McIntosh Road will be restricted to existing users and emergency access. Full occupancy of the development is expected to occur by 2018.

Trip Generation

Estimates of average weekday and weekday a.m. and p.m. peak hour vehicle trip ends were obtained from the standard reference manual, *Trip Generation, 9th Edition*, published by the Institute of Transportation Engineers (Reference 3). Table 3 shows the estimated trip generation.

Table 3 summarizes the daily, weekday a.m., and weekday p.m. peak-hour trips for the proposed development.

Table 3: Site Trip Generation Estimate

Land Use	ITE Code	Size	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Single Family Homes	210	55 units	524	41	10	31	55	35	20
Condominium/Townhouse	230	25 units	145	11	2	9	13	9	4
Total			**669**	**52**	**12**	**40**	**68**	**44**	**24**

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 other trip distribution graphics made for similar projects in this area. Figure 6 illustrates the proposed trip distribution patterns for site build-out.

Trip Assignment

The weekday a.m. and p.m. peak hour site trips shown in Table 3 were assigned to the roadway network based on the trip distribution patterns shown in Figure 6. Figure 6 also shows the a.m. and p.m. peak hour trip assignments for site development.

Year 2018 Total Traffic Conditions

The total traffic conditions analysis forecasts how the transportation system within the study area will operate with the inclusion of traffic associated with the proposed residential development. The total

traffic volumes at the study intersections include the site-generated trips (Figure 6) and 2018 background traffic volumes (Figure 5).

Figure 7 shows the 2018 total traffic volumes and operations during the weekday a.m. and p.m. peak hours. As shown, all of the movements at the study intersections are predicted to continue to operate acceptably and meet the mobility standards enforced by the governing agency. *Appendix "G" includes the year 2018 total traffic analysis worksheets.*

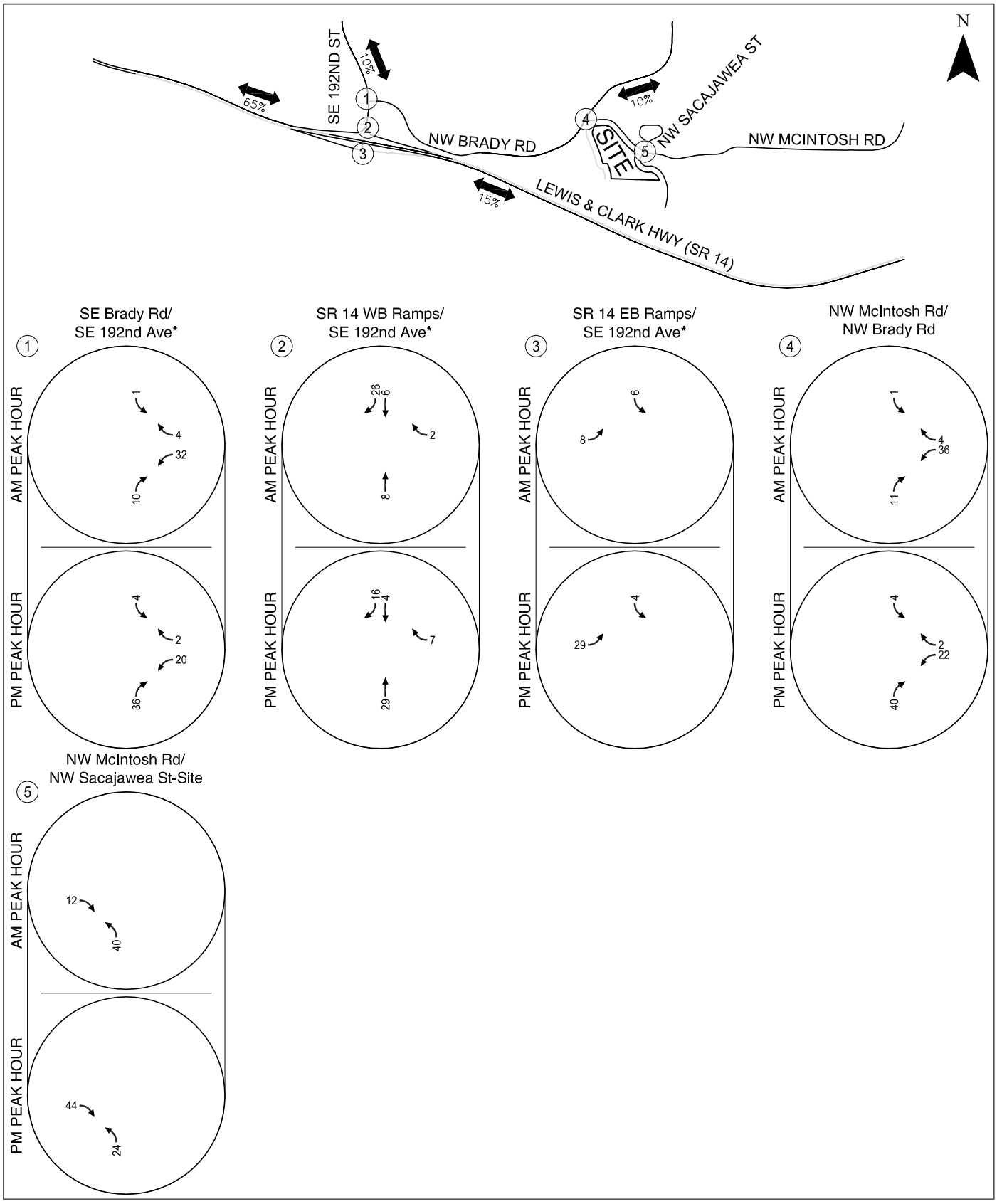
Queueing Analysis

A 95th-percentile queue analysis was performed for the primary site access to NW McIntosh Road under the 2018 total traffic conditions of the weekday a.m. and p.m. peak hours. The purpose of the analysis was to determine the amount of vehicle storage necessary to safely accommodate vehicles leaving the site driveway and entering the site from either NW McIntosh Road or NW Sacajawea Street. Table 4 summarizes the 95th-percentile queue estimates for these movements, rounded up to the nearest single vehicle length (estimated at 25 feet). *A more detailed summary of the queue results are provided within the LOS worksheets for this intersection in Appendix "G".*

Table 4: 95th-Percentile Queue Analysis Results (2018 Total Traffic Conditions)

Intersection	Movement	Proposed Storage (ft)	AM Peak Hour Queue (ft)	PM Peak Hour Queue (ft)	Is Proposed Storage Adequate?
Proposed Site Access/ NW McIntosh Road	EB Left	-	0	0	Yes
	WB Left	-	0	0	Yes
	NB	50	25	25	Yes
	SB	50	25	25	Yes

The table above indicates that 95th-percentile queues are expected to be short, at no more than one vehicle (25 feet) and can be contained within the proposed queue storage lengths of 50 feet for the specified turning movements.

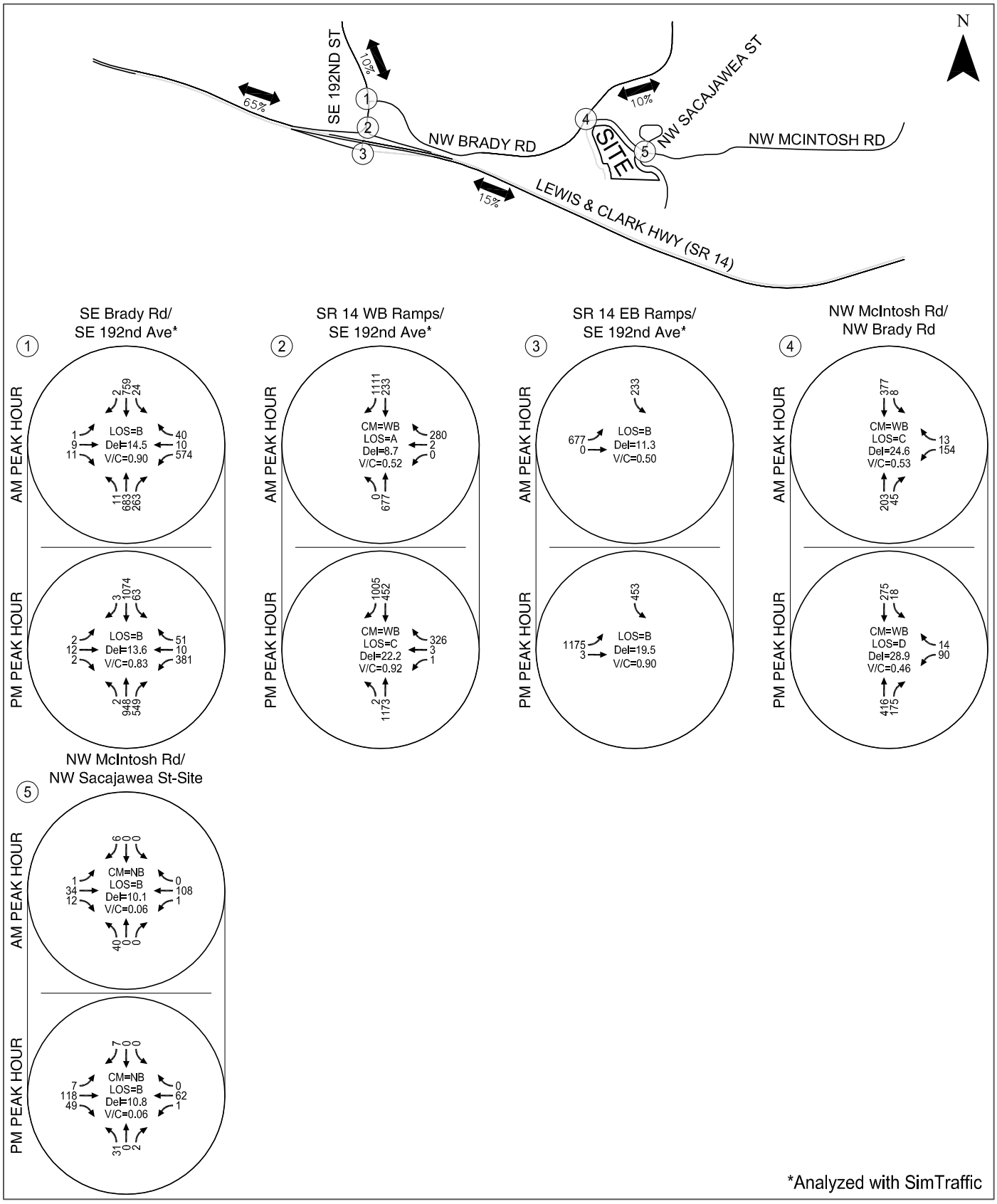


Site-Generated Trips
Weekday AM and PM Peak Hours
Camas, Washington

Figure **6**

H:\projfile\19693 - McIntosh Road PRD\dwgs\figs\19693_Figs.dwg Mar 10, 2017 - 3:32pm - kpurser Layout Tab: Figure 6

KITTELSON & ASSOCIATES



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2018 Total Traffic Conditions
Weekday AM and PM Peak Hours
Camas, Washington

Figure
7

Site Access and Sight Distance Review

A sight distance analysis was conducted at the proposed driveway to NW McIntosh Road. For the analysis, measurements of intersection sight distance (ISD) and stopping sight distance (SSD) were obtained in the field and then compared with design guidance presented in *A Policy on Geometric Design of Highways and Streets (*AASHTO, Reference 4).

The proposed site driveway is located on NW McIntosh Road, approximately 1,200 feet east of NW Brady Road (centerline-to-centerline distance). For the analysis, intersection sight distance (ISD) measurements were obtained in the field from a viewpoint 14.5 feet behind the edge of the traveled way and from a height of 3.5 feet above the ground, looking toward an object that is 3.5 feet above the ground, consistent with current AASHTO recommendations. Stopping sight distance (SSD) measurements were obtained in the field from a viewpoint 3.5 feet above the ground looking toward an object that is 2.0 feet above the ground, consistent with AASHTO methodologies. The field measurements and corresponding AASHTO design guidelines for the posted 35 mph speed on NW McIntosh Road are summarized below in Table 5.

Table 5. Sight Distance Summary (Case B1 – Left Turn from the Minor Road)

	AASHTO Design Guideline	Observed Sight Distance	Satisfies AASHTO Guidelines?
Direction of Travel	ISD / SSD	ISD / SSD	ISD / SSD
Eastbound (facing west from driveway)	390 feet / 250 feet	>500 feet / >500 feet	Yes / Yes
Westbound (facing east from driveway)	390 feet / 250 feet	> 500 feet / > 500 feet	Yes / Yes

As shown in Table 5, the proposed site driveway is expected to meet both intersection sight distance and stopping sight distance when facing east from the future driveway location.

FINDINGS AND RECOMMENDATIONS

Based on the results of the transportation impact analysis, the proposed residential site can be developed while maintaining acceptable levels of service and safety on the surrounding transportation system given the recommended mitigation measures. The primary findings and recommendations of this study are summarized below.

- The proposed residential development is estimated to generate a maximum increase of 669 weekday daily trips, of which 52 are expected to occur during the a.m. peak hour (12 in, 40 out) and 68 are expected to occur during the p.m. peak hour (44 in, 24 out).
- All study intersections were found to operate acceptably under existing and forecasted future conditions.
- No off-site transportation capacity or safety-related mitigations are recommended to support the proposed development, except to install appropriate stop sign control and striping at the primary access to NW McIntosh Road, across from Sacajawea Street.
- An existing private driveway near the intersection of NW McIntosh Road and NW Brady Road will remain in place, restricted to existing users and emergency access for the subdivision.
- Any new landscaping, signage or above-ground utilities along the site frontages should be installed and maintained to ensure that adequate sight distance is continued to be met upon buildout.

We trust this report adequately addresses the traffic impacts associated with the proposed residential development. Please contact us if you have any questions.

Sincerely,
KITTELSON & ASSOCIATES, INC.

Brian J. Dunn, PE
Associate Engineer

Kristine Connolly
Engineering Associate

REFERENCES

1. City of Camas. *Report for City of Camas Traffic Impact Fee*. 2003.
2. Transportation Research Board. *Highway Capacity Manual 2000*. 2000.
3. Institute of Transportation Engineers. *Trip Generation, 9th Edition*. 2012.
4. American Association of State Highway and Transportation Officials (AASHTO). *A Policy on the Geometric Design of Highways and Streets*. 2011.

APPENDIX

A. Crash data
B. Description of level of service criteria
C. Traffic count data
D. Existing Traffic Operations Analysis Worksheets
E. In-process volumes
F. Year 2018 Background Traffic Operations Analysis Worksheets
G. Year 2018 Total Traffic Operations Analysis Worksheets

Appendix A
Crash Data

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* MULTIPLE INTERSECTIONS & ROAD SEGMENT IN THE CITIES OF CAMAS & VANCOUVER
1/1/2011 - *available 2016* *See 2nd tab for road information & Interchange drawing for reference*

JURISDICTION	CITY	PRIMARY TRAFFICWAY	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	MILE POST	A / B	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	FIRST COLLISION TYPE / OBJECT STRUCK	VEH 1 COMP DIR FROM	VEH 1 COMP DIR TO	VEH 2 COMP DIR FROM	VEH 2 COMP DIR TO	IMPACT LOCATION (Effective for City, County & Misc 1/1/2010; SR's indefinite)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD	
State Route	Vancouver	014Q101046		EB Ramps					0.00		E364016	10/6/2014	2:15	No Injury	Guardrail - Face	West	East			Left Shoulder On Ramp Increasing Milepost Side of Mainline	1,135,092.35	97,928.30	
State Route	Vancouver	014LX01009		EB Ramps					0.07		E424922	5/1/2015	23:35	Possible Injury	Same direction -- both turning left -- both moving -- sideswipe	East	South	East	South	Lane 1 LX Decreasing Milepost	1,135,096.50	97,938.12	
State Route	Vancouver	014LX01009		EB Ramps					0.07		E444518	7/13/2015	15:42	Serious Injury	Bridge Rail - Face	West	East			Right Shoulder LX Decreasing Milepost	1,135,093.31	97,931.61	
State Route	Vancouver	014P100982		EB Ramps					0.26		E458095	9/2/2015	20:39	No Injury	Guardrail - Face	North	East			Right Shoulder Off Ramp Increasing Milepost Side of Mainline	1,135,091.03	97,921.56	
State Route	Vancouver	014LX01009		EB Ramps					0.06		E540486	4/29/2016	10:45	No Injury	Guardrail - Face	West	North			Past Right Shoulder LX Increasing Milepost (Prior to 2002 Impact Location Code was not lane specific)	1,135,096.54	97,973.91	
State Route	Vancouver	014P100982		EB Ramps					0.26		E291426	12/3/2013	16:03	No Injury	Rear End	None	West	East	West	Vehicle Stopped	Lane 1 Off Ra	#########	
City Street	Vancouver	SE BRADY RD	100	SE 192ND AVE							3432047	9/9/2014	11:02	No Injury	Roadway Ditch	West	East			Past the Outside Shoulder of Primary Trafficway	1,135,282.85	98,772.11	
City Street	Vancouver	SE 192ND AVE	8900	SE BRADY RD	0.25	M	N	SE BRADY RD			3715181	7/7/2014	2:05	No Injury	Street Light Pole or Base	South	North			Past the Outside Shoulder of Primary Trafficway	1,134,804.07	100,011.35	
City Street	Vancouver	SE 192ND AVE		SE BRADY RD							3677749	8/31/2014	17:48	Possible Injury	Entering at angle	South	North	East	South	Lane of Primary Trafficway	1,135,222.79	98,771.60	
City Street	Vancouver	SE 192ND AVE	8600	SE BRADY RD	368	F	N	SE BRADY RD			E500120	12/23/2015	13:00	No Injury	Street Light Pole or Base	South	Northeast			Past the Outside Shoulder of Primary Trafficway	1,135,165.96	99,135.34	
City Street	Vancouver	SE 192ND AVE	7300	SE BRADY RD	500	F	N	SE BRADY RD			E533998	3/26/2016	2:40	No Injury	Tree or Stump (stationary)	South	North			Past the Outside Shoulder of Primary Trafficway	1,135,122.83	99,260.97	
State Route	Vancouver	014R101037		WB Ramps					0.28		E341199	7/9/2014	18:10	No Injury	From same direction - both going straight - one stopped - rear-end	East	West	East	Vehicle Stopped	Lane 1 Off Ramp Decreasing Milepost Side of Mainline	1,135,154.30	98,212.49	
State Route	Vancouver	014LX01009		WB Ramps					0.00		E351595	8/20/2014	9:13	No Injury	Entering at angle	East	South	South	North	Lane 2 LX Decreasing Milepost	1,135,148.69	98,213.97	
State Route	Vancouver	014LX01009		WB Ramps					0.00		E351163	8/23/2014	15:36	No Injury	From opposite direction - one left turn - one straight	South	West	North	South	Lane 1 LX Increasing Milepost (Prior to 2002 Impact Location Code was not lane specific)	1,135,148.69	98,213.97	
State Route	Vancouver	014R101037		WB Ramps					0.28		E356974	9/10/2014	18:17	No Injury	Same direction -- both turning right -- one stopped -- rear end	East	West	East	Vehicle Stopped	Lane 1 Off Ramp Decreasing Milepost Side of Mainline	1,135,151.37	98,213.27	
State Route	Vancouver	014R101037		WB Ramps					0.28		3472623	9/15/2014	15:32	No Injury	From same direction - both going straight - one stopped - rear-end	East	West	Vehicle Backing	Vehicle Stopped	Lane 1 Off Ramp Decreasing Milepost Side of Mainline	1,135,155.04	98,212.30	
State Route	Vancouver	014LX01009		WB Ramps					0.00		E369043	10/26/2014	2:48	No Injury	Entering at angle	East	West	North	West	Lane 1 LX Increasing Milepost (Prior to 2002 Impact Location Code was not lane specific)	1,135,148.69	98,213.97	
State Route	Vancouver	014R101037		WB Ramps					0.28		3319856	11/6/2014	12:48	No Injury	From same direction - both going straight - one stopped - rear-end	West	East		Vehicle Stopped	Lane 1 Off Ramp Decreasing Milepost Side of Mainline	1,135,148.69	98,213.97	
State Route	Vancouver	014R101037		WB Ramps					0.28		E392353	1/8/2015	15:40	No Injury	From same direction - both going straight - one stopped - rear-end	East	North	Vehicle Stopped	Vehicle Stopped	Lane 1 Off Ramp Decreasing Milepost Side of Mainline	1,135,146.65	98,199.67	
State Route	Vancouver	014S100975		WB Ramps					0.00		E393435	1/11/2015	17:49	No Injury	Concrete Barrier/Jersey Barrier - Face	West	South			Right Shoulder On Ramp Decreasing Milepost Side of Mainline	1,135,148.69	98,213.97	
State Route	Vancouver	014S100975		WB Ramps					0.01		E411142	3/22/2015	18:02	No Injury	Guardrail - Face	North	West			Left Shoulder On Ramp Decreasing Milepost Side of Mainline	1,135,116.03	98,217.02	
State Route	Vancouver	014R101037		WB Ramps					0.28		E413386	3/30/2015	16:55	No Injury	Same direction -- both turning right -- one stopped -- rear end	East	North	East	Vehicle Stopped	Lane 1 Off Ramp Decreasing Milepost Side of Mainline	1,135,150.95	98,216.44	
State Route	Vancouver	014LX01009		WB Ramps					0.00		E426591	5/21/2015	14:55	No Injury	From opposite direction - one left turn - one straight	South	West	South	North	Lane 1 LX Increasing Milepost (Prior to 2002 Impact Location Code was not lane specific)	1,135,148.52	98,212.55	
State Route	Vancouver	014R101037		WB Ramps					0.28		E462206	9/3/2015	15:40	Possible Injury	From same direction - both going straight - one stopped - rear-end	East	North	Vehicle Stopped	Vehicle Stopped	Lane 1 Off Ramp Decreasing Milepost Side of Mainline	1,135,148.69	98,213.97	
State Route	Vancouver	014R101037		WB Ramps					0.28		E482615	11/12/2015	10:00	No Injury	From same direction - both going straight - one stopped - rear-end	West	East	Vehicle Stopped	Vehicle Stopped	Lane 1 Off Ramp Decreasing Milepost Side of Mainline	1,135,148.69	98,213.97	
State Route	Vancouver	014R101037		WB Ramps					0.28		E509756	1/26/2016	18:48	No Injury	From same direction - both going straight - one stopped - rear-end	East	West	East	Vehicle Stopped	Lane 1 Off Ramp Decreasing Milepost Side of Mainline	1,135,148.69	98,213.97	
State Route	Vancouver	014R101037		WB Ramps					0.28		E534287	4/12/2016	18:10	No Injury	From same direction - both going straight - one stopped - sideswipe	East	North	East	North	Lane 1 Off Ramp Decreasing Milepost Side of Mainline	1,135,144.97	98,199.86	
State Route	Vancouver	014LX01009		WB Ramps					0.00		E534230	4/13/2016	6:25	Possible Injury	Guardrail - Face	North	West			Left Shoulder On Ramp Decreasing Milepost Side of Mainline	1,135,148.69	98,213.97	
State Route	Vancouver	014LX01009		WB Ramps					0.00		3614186	6/23/2013	22:50	No Injury	Fixed Object		East	North			Past Right Sho	#########	98,213.97
State Route	Vancouver	014LX01009		WB Ramps					0.00		E266573	8/25/2013	12:00	No Injury	Fixed Object		North	West			Right Shoulde	#########	98,229.55
State Route	Vancouver	014R101037		WB Ramps					0.28		3432035	9/5/2013	8:25	Evident Injury	Rear End	Inattention	East	North	Vehicle Backing	Vehicle Stopped	Lane 1 Off Ra	#########	98,213.97
State Route	Vancouver	014LX01009		WB Ramps					0.00		3614159	10/12/2013	15:55	No Injury	Fixed Object		North	West			Right Shoulde	#########	98,213.97
State Route	Vancouver	014LX01009		WB Ramps					0.00		E289535	12/1/2013	14:53	No Injury	Fixed Object		North	West			Left Shoulder	#########	98,213.97
State Route	Vancouver	014LX01009		WB Ramps					0.00		E289533	12/1/2013	8:35	No Injury	Fixed Object		South	West			Left Shoulder	#########	98,213.97
State Route	Vancouver	014S100975		WB Ramps					0.02		E295031	12/21/2013	10:47	No Injury	Fixed Object		North	West			Left Shoulder	#########	97,928.30
State Route	Vancouver	014S100975		WB Ramps					0.02		E303827	1/28/2014	15:07	No Injury	Fixed Object		South	West			Left Shoulder	#########	98,223.20
State Route	Vancouver	014R101037		WB Ramps					0.28		E312001	2/28/2014	16:16	No Injury	Rear End	None	Vehicle Stop	West	West	Vehicle Stopped	Lane 1 Off Ra	#########	98,223.20
City Street	Vancouver	NW BRADY RD	20800		0.1	M	NE	NW MCINTOSH RD			3711770	10/28/2015	13:28	Evident Injury	Vehicle overturned	North	Northeast			Past the Outside Shoulder of Primary Trafficway	1,139,338.26	98,885.99	98,213.97

Appendix B

Description of Level-of-Service Criteria

APPENDIX B 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".[1]

SIGNALIZED INTERSECTIONS

The six level-of-service grades are described qualitatively for signalized intersections in Table B1. Additionally, Table B2 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 B1. Level-of-Service Definitions (Signalized Intersections)[1]

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.

[1] Most of the material in this appendix is adapted from the Transportation Research Board, Highway Capacity Manual, (2000).

Table B2. Level-of-Service Criteria for Signalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	<10.0
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤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 B3. A quantitative definition of level of service for unsignalized intersections is presented in Table B4. Using this definition, Level of Service "E" is generally considered to represent the minimum acceptable design standard.

Table B3. Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Delay per Vehicle to Minor Street
A	• Nearly all drivers find freedom of operation. • Very seldom is there more than one vehicle in queue.
B	• Some drivers begin to consider the delay an inconvenience. • Occasionally there is more than one vehicle in queue.
C	• Many times there is more than one vehicle in queue. • Most drivers feel restricted, but not objectionably so.
D	• Often there is more than one vehicle in queue. • Drivers feel quite restricted.
E	• 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. • There is almost always more than one vehicle in queue. • Drivers find the delays approaching intolerable levels.
F	• Forced flow. • Represents an intersection failure condition that is caused by geometric and/or operational constraints external to the intersection.

Table B4. Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	<10.0
B	>10.0 and ≤ 15.0
C	>15.0 and ≤ 25.0
D	>25.0 and ≤ 35.0
E	>35.0 and ≤ 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 C
Traffic Count Data

Type of peak hour being reported: User-Defined

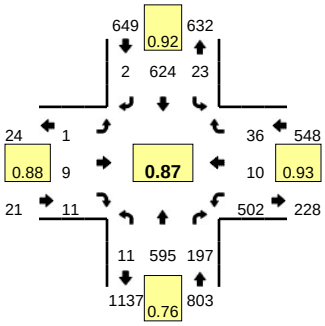
Method for determining peak hour: Total Entering Volume

LOCATION: SE 192nd Ave -- SE Brady Rd

QC JOB #: 13822503

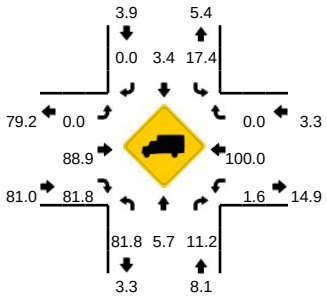
CITY/STATE: Camas, WA

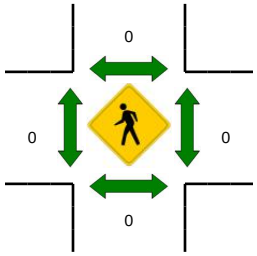
DATE: Thu, May 26 2016

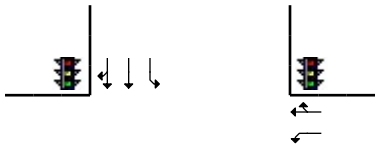


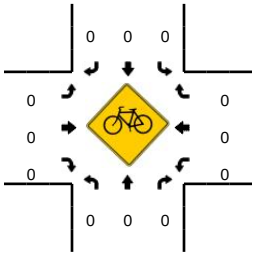
Peak-Hour: 7:10 AM -- 8:10 AM

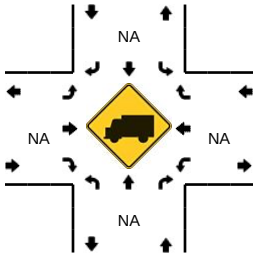
Peak 15-Min: 7:45 AM -- 8:00 AM

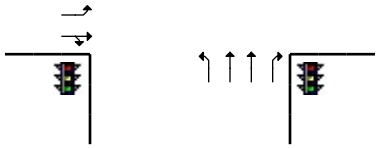


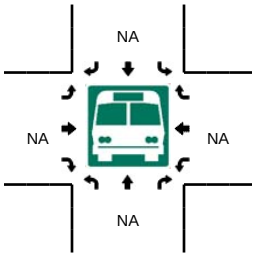












5-Min Count Period Beginning At	SE 192nd Ave (Northbound)				SE 192nd Ave (Southbound)				SE Brady Rd (Eastbound)				SE Brady Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	54	6	0	0	42	1	0	0	0	0	1	36	0	1	0	141	
7:05 AM	2	28	4	0	3	36	1	0	0	0	1	1	52	0	3	0	131	
7:10 AM	1	41	5	0	1	56	0	0	0	0	4	1	46	0	3	0	158	
7:15 AM	2	43	10	0	1	68	0	0	0	0	1	0	38	0	2	0	165	
7:20 AM	0	44	8	0	1	48	1	0	0	0	0	0	38	2	2	0	144	
7:25 AM	0	53	16	0	1	49	0	0	0	1	1	0	44	0	2	0	167	
7:30 AM	0	48	12	0	0	41	0	0	0	1	1	0	48	1	2	0	154	
7:35 AM	1	50	15	0	3	52	0	0	0	1	0	0	38	1	4	0	165	
7:40 AM	2	42	21	0	2	47	0	0	0	0	0	0	43	1	3	0	161	
7:45 AM	0	67	22	0	1	50	0	0	0	3	0	0	48	0	4	0	195	
7:50 AM	1	68	31	0	3	57	0	0	0	0	1	0	40	1	3	0	205	
7:55 AM	1	49	25	0	4	50	0	0	0	0	1	0	44	2	5	0	181	1967
8:00 AM	0	47	18	0	2	51	0	0	0	3	0	0	42	1	2	0	166	1992
8:05 AM	3	43	14	0	3	55	1	1	0	0	2	0	33	1	4	0	160	2021
8:10 AM	0	28	18	0	2	46	1	0	1	0	2	0	33	1	5	0	137	2000
8:15 AM	3	44	18	0	1	56	0	0	0	0	2	0	30	1	3	0	158	1993
8:20 AM	1	35	13	0	2	51	0	0	0	3	3	0	35	0	5	0	148	1997
8:25 AM	1	39	17	0	2	60	0	0	0	2	2	0	28	1	4	0	156	1986
8:30 AM	0	39	16	0	2	54	0	0	0	1	1	0	38	1	5	0	157	1989
8:35 AM	1	42	19	0	2	44	0	0	0	1	0	0	43	3	4	0	159	1983
8:40 AM	1	48	25	0	1	43	0	0	1	1	2	0	39	1	4	0	166	1988
8:45 AM	2	47	21	0	0	39	1	0	0	2	1	0	35	2	3	0	153	1946
8:50 AM	1	54	31	0	4	34	1	0	0	1	1	0	48	2	1	0	178	1919
8:55 AM	0	45	16	0	0	30	0	0	1	3	2	0	45	2	5	0	149	1887

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	8	736	312	0	32	628	0	0	0	12	8	0	528	12	48	0	2324
Heavy Trucks	4	36	28		8	24	0		0	12	4		20	12	0		148
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/14/2016 3:07 PM

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

Type of peak hour being reported: User-Defined

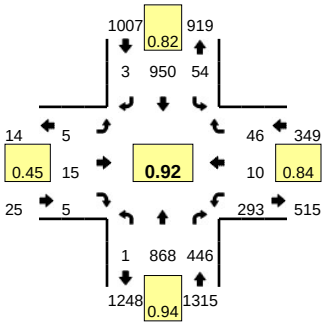
Method for determining peak hour: Total Entering Volume

LOCATION: SE 192nd Ave -- SE Brady Rd

QC JOB #: 13822504

CITY/STATE: Camas, WA

DATE: Thu, May 26 2016



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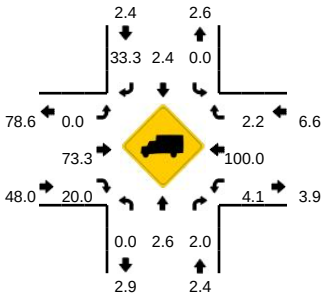
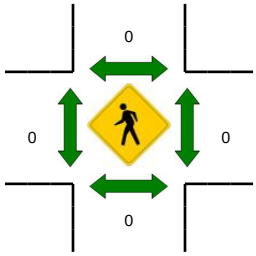
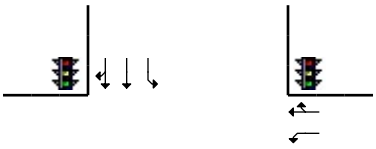
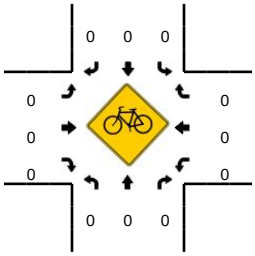
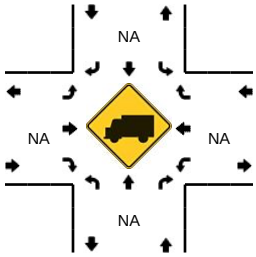
Peak 15-Min: 5:05 PM -- 5:20 PM

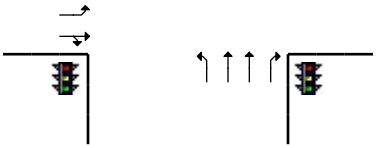


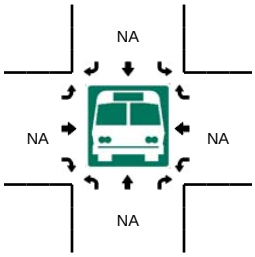












5-Min Count Period Beginning At	SE 192nd Ave (Northbound)				SE 192nd Ave (Southbound)				SE Brady Rd (Eastbound)				SE Brady Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	78	39	0	3	50	1	0	0	3	1	0	24	1	3	0	204	
4:05 PM	0	58	34	0	3	75	0	0	2	0	1	0	33	1	3	0	210	
4:10 PM	0	65	41	0	2	107	0	0	0	1	3	0	15	3	2	0	239	
4:15 PM	0	87	32	0	4	72	0	0	2	2	1	0	26	0	5	0	231	
4:20 PM	0	70	32	0	4	64	0	0	0	1	2	0	31	0	6	0	210	
4:25 PM	1	78	35	0	5	65	0	0	0	0	0	0	25	1	5	0	215	
4:30 PM	1	77	34	0	1	43	0	0	1	0	0	0	22	2	3	0	184	
4:35 PM	0	70	34	0	11	69	0	0	0	6	0	0	18	1	4	0	213	
4:40 PM	0	68	38	0	4	77	0	0	0	0	3	0	27	0	3	0	220	
4:45 PM	0	77	37	0	5	68	0	0	2	2	1	0	22	1	3	0	218	
4:50 PM	0	67	27	0	3	66	0	0	1	0	0	0	30	2	4	0	200	
4:55 PM	0	73	41	0	3	74	1	0	0	0	0	0	28	0	8	0	228	2572
5:00 PM	0	70	33	0	4	67	0	0	0	3	0	0	16	0	4	0	197	2565
5:05 PM	0	87	38	0	4	85	0	0	1	0	0	0	33	1	1	0	250	2605
5:10 PM	0	76	37	0	6	108	0	0	0	0	0	0	28	1	5	0	261	2627
5:15 PM	0	56	37	0	3	91	0	0	1	1	0	0	28	1	6	0	224	2620
5:20 PM	1	75	33	0	4	94	1	0	0	2	0	0	25	2	5	0	242	2652
5:25 PM	0	86	46	0	5	72	1	0	0	1	0	0	14	0	3	0	228	2665
5:30 PM	0	63	45	0	2	79	0	0	0	0	1	0	24	1	0	0	215	2696
5:35 PM	0	46	28	0	7	70	0	0	0	1	1	0	28	1	4	0	186	2669
5:40 PM	0	65	48	0	8	86	0	0	0	1	0	0	29	1	5	0	243	2692
5:45 PM	0	60	35	0	4	73	0	0	0	2	0	0	23	1	2	0	200	2674
5:50 PM	1	67	40	0	8	69	0	1	0	1	0	0	29	1	5	0	222	2696
5:55 PM	0	64	37	0	4	42	0	0	0	0	0	0	42	0	4	0	193	2661

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	876	448	0	52	1136	0	0	8	4	0	0	356	12	48	0	2940
Heavy Trucks	0	8	8		0	12	0		0	4	0		8	12	0		52
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/14/2016 3:09 PM

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

Type of peak hour being reported: User-Defined

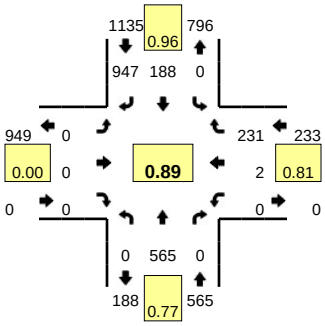
Method for determining peak hour: Total Entering Volume

LOCATION: SE 192nd Ave -- SR 14 WB Ramps

CITY/STATE: Camas, WA

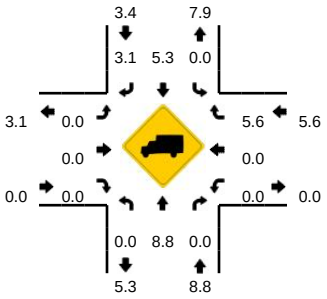
QC JOB #: 13822507

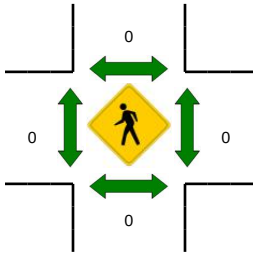
DATE: Thu, May 26 2016

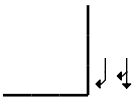


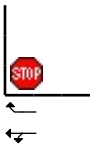
Peak-Hour: 7:10 AM -- 8:10 AM

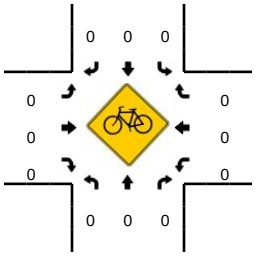
Peak 15-Min: 7:45 AM -- 8:00 AM

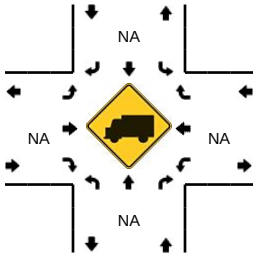


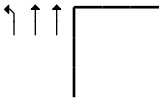


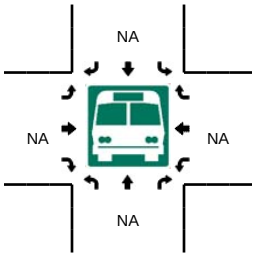












5-Min Count Period Beginning At	SE 192nd Ave (Northbound)				SE 192nd Ave (Southbound)				SR 14 WB Ramps (Eastbound)				SR 14 WB Ramps (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	44	0	0	0	14	62	0	0	0	0	0	0	0	13	0	133	
7:05 AM	0	24	0	0	0	15	78	0	0	0	0	0	0	0	11	0	128	
7:10 AM	0	34	0	0	0	25	81	0	0	0	0	0	0	0	18	0	158	
7:15 AM	0	39	0	0	0	26	74	0	0	0	0	0	0	0	10	0	149	
7:20 AM	0	31	0	0	0	18	72	0	0	0	0	0	0	0	23	0	144	
7:25 AM	0	46	0	0	0	13	82	0	0	0	0	0	0	0	20	0	161	
7:30 AM	0	50	0	0	0	11	77	0	0	0	0	0	0	0	16	0	154	
7:35 AM	0	41	0	0	0	11	84	0	0	0	0	0	0	0	18	0	154	
7:40 AM	0	62	0	0	0	12	73	0	0	0	0	0	0	0	17	0	164	
7:45 AM	0	66	0	0	0	15	81	0	0	0	0	0	0	0	25	0	187	
7:50 AM	0	56	0	0	0	22	81	0	0	0	0	0	0	0	24	0	183	
7:55 AM	0	58	0	0	0	13	79	0	0	0	0	0	0	1	22	0	173	1888
8:00 AM	0	48	0	0	0	12	83	0	0	0	0	0	0	0	16	0	159	1914
8:05 AM	0	34	0	0	0	10	80	0	0	0	0	0	0	1	22	0	147	1933
8:10 AM	0	27	0	0	0	16	63	0	0	0	0	0	0	0	18	0	124	1899
8:15 AM	1	42	0	0	0	14	72	0	0	0	0	0	0	0	24	0	153	1903
8:20 AM	0	32	0	0	0	15	75	0	0	0	0	0	0	0	17	0	139	1898
8:25 AM	0	42	0	0	0	13	73	0	0	0	0	0	0	0	14	0	142	1879
8:30 AM	0	37	0	0	0	18	77	0	0	0	0	0	0	0	18	0	150	1875
8:35 AM	0	39	0	0	0	15	65	0	0	0	0	0	0	0	23	0	142	1863
8:40 AM	0	47	0	0	0	13	76	0	0	0	0	0	0	0	25	0	161	1860
8:45 AM	0	51	0	0	0	16	57	0	0	0	0	0	0	0	23	0	147	1820
8:50 AM	1	57	0	0	0	12	73	0	0	0	0	0	0	0	24	0	167	1804
8:55 AM	0	45	0	0	0	12	64	0	0	0	0	0	1	0	18	0	140	1771

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	720	0	0	0	200	964	0	0	0	0	0	0	4	284	0	2172
Heavy Trucks	0	64	0		0	12	40		0	0	0		0	0	0		116
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/14/2016 3:06 PM

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

Type of peak hour being reported: User-Defined

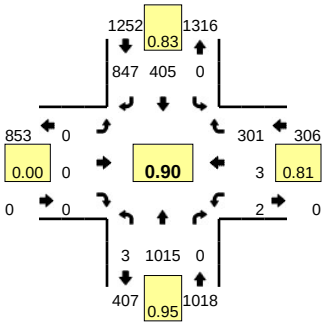
Method for determining peak hour: Total Entering Volume

LOCATION: SE 192nd Ave -- SR 14 WB Ramps

CITY/STATE: Camas, WA

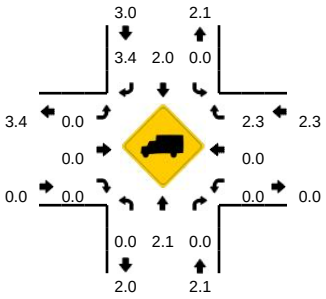
QC JOB #: 13822508

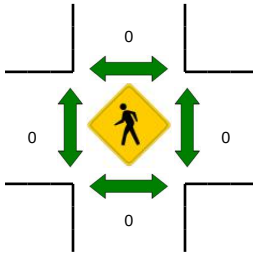
DATE: Thu, May 26 2016

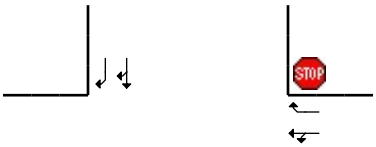


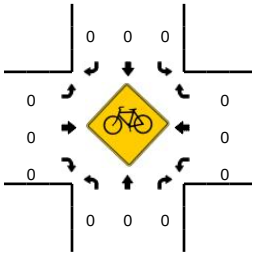
Peak-Hour: 4:35 PM -- 5:35 PM

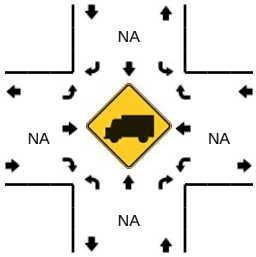
Peak 15-Min: 5:05 PM -- 5:20 PM

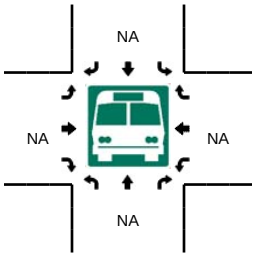












5-Min Count Period Beginning At	SE 192nd Ave (Northbound)				SE 192nd Ave (Southbound)				SR 14 WB Ramps (Eastbound)				SR 14 WB Ramps (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	84	0	0	0	22	51	0	0	0	0	0	1	0	34	0	192	
4:05 PM	1	72	0	0	0	31	81	0	0	0	0	0	0	0	28	0	213	
4:10 PM	1	90	0	0	0	46	78	0	0	0	0	0	0	0	23	0	238	
4:15 PM	0	92	0	0	0	33	60	0	0	0	0	0	0	1	21	0	207	
4:20 PM	0	74	0	0	0	43	59	0	0	0	0	0	0	1	27	0	204	
4:25 PM	0	86	0	0	0	28	61	0	0	0	0	0	0	0	29	0	204	
4:30 PM	1	78	0	0	0	24	41	0	0	0	0	0	0	0	29	0	173	
4:35 PM	0	88	0	0	0	31	57	0	0	0	0	0	1	0	27	0	204	
4:40 PM	0	73	0	0	0	38	71	0	0	0	0	0	0	0	21	0	203	
4:45 PM	0	92	0	0	0	34	56	0	0	0	0	0	0	0	21	0	203	
4:50 PM	1	70	0	0	0	39	60	0	0	0	0	0	0	0	25	0	195	
4:55 PM	1	93	0	0	0	24	76	0	0	0	0	0	0	1	24	0	219	2455
5:00 PM	0	84	0	0	0	27	54	0	0	0	0	0	0	0	27	0	192	2455
5:05 PM	1	77	0	0	0	39	86	0	0	0	0	0	0	0	38	0	241	2483
5:10 PM	0	80	0	0	0	34	87	0	0	0	0	0	0	0	29	0	230	2475
5:15 PM	0	90	0	0	0	42	91	0	0	0	0	0	1	1	20	0	245	2513
5:20 PM	0	77	0	0	0	35	80	0	0	0	0	0	0	0	26	0	218	2527
5:25 PM	0	100	0	0	0	24	52	0	0	0	0	0	0	1	24	0	201	2524
5:30 PM	0	91	0	0	0	38	77	0	0	0	0	0	0	0	19	0	225	2576
5:35 PM	0	65	0	0	0	34	64	0	0	0	0	0	0	0	14	0	177	2549
5:40 PM	0	86	0	0	0	39	76	0	0	0	0	0	0	0	21	0	222	2568
5:45 PM	0	76	0	0	0	31	67	0	0	0	0	0	0	0	19	0	193	2558
5:50 PM	0	79	0	0	0	34	60	0	0	0	0	0	0	0	25	0	198	2561
5:55 PM	0	81	0	0	0	33	55	0	0	0	0	0	0	0	22	0	191	2533

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	4	988	0	0	0	460	1056	0	0	0	0	0	4	4	348	0	2864
Heavy Trucks	0	8	0		0	12	12		0	0	0		0	0	0		32
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/14/2016 3:09 PM

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

Type of peak hour being reported: User-Defined

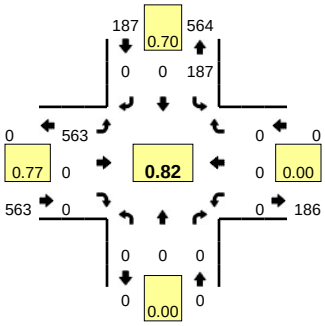
Method for determining peak hour: Total Entering Volume

LOCATION: SE 192nd Ave -- SR 14 EB Ramps

QC JOB #: 13822509

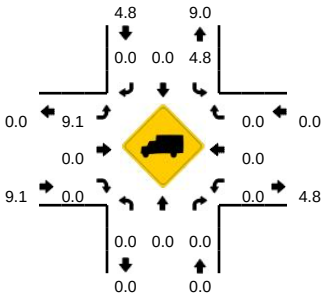
CITY/STATE: Camas, WA

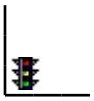
DATE: Thu, May 26 2016

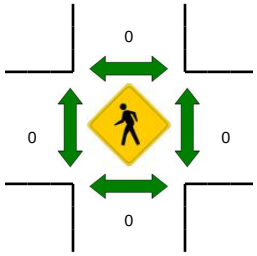


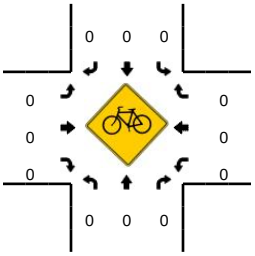
Peak-Hour: 7:10 AM -- 8:10 AM

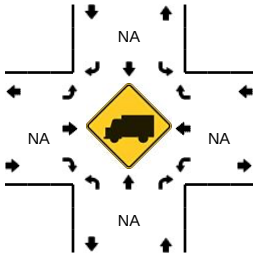
Peak 15-Min: 7:40 AM -- 7:55 AM

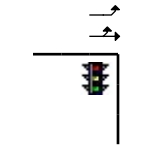


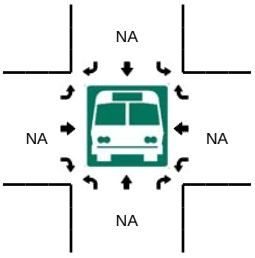












5-Min Count Period Beginning At	SE 192nd Ave (Northbound)				SE 192nd Ave (Southbound)				SR 14 EB Ramps (Eastbound)				SR 14 EB Ramps (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	15	0	0	0	45	0	0	0	0	0	0	0	60	
7:05 AM	0	0	0	0	15	0	0	0	24	0	0	0	0	0	0	0	39	
7:10 AM	0	0	0	0	23	0	0	0	36	0	0	0	0	0	0	0	59	
7:15 AM	0	0	0	0	25	0	0	1	35	0	0	0	0	0	0	0	61	
7:20 AM	0	0	0	0	18	0	0	0	32	0	0	0	0	0	0	0	50	
7:25 AM	0	0	0	0	13	0	0	0	44	0	0	0	0	0	0	0	57	
7:30 AM	0	0	0	0	12	0	0	0	50	0	0	0	0	0	0	0	62	
7:35 AM	0	0	0	0	8	0	0	0	47	0	0	0	0	0	0	0	55	
7:40 AM	0	0	0	0	15	0	0	0	56	0	0	0	0	0	0	0	71	
7:45 AM	0	0	0	0	15	0	0	0	68	0	0	0	0	0	0	0	83	
7:50 AM	0	0	0	0	21	0	0	0	55	0	0	0	0	0	0	0	76	
7:55 AM	0	0	0	0	11	0	0	0	60	0	0	0	0	0	0	0	71	744
8:00 AM	0	0	0	0	15	0	0	0	45	0	0	0	0	0	0	0	60	744
8:05 AM	0	0	0	0	10	0	0	0	35	0	0	0	0	0	0	0	45	750
8:10 AM	0	0	0	0	15	0	0	0	26	0	0	0	0	0	0	0	41	732
8:15 AM	0	0	0	0	13	0	0	0	44	0	0	0	0	0	0	0	57	728
8:20 AM	0	0	0	0	15	0	0	0	34	0	0	0	0	0	0	0	49	727
8:25 AM	0	0	0	0	13	0	0	0	43	0	0	0	0	0	0	0	56	726
8:30 AM	0	0	0	0	19	0	0	0	35	0	0	0	0	0	0	0	54	718
8:35 AM	0	0	0	0	14	0	0	0	41	0	0	0	0	0	0	0	55	718
8:40 AM	0	0	0	0	13	0	0	0	48	0	0	0	0	0	0	0	61	708
8:45 AM	0	0	0	0	12	0	0	0	53	0	0	0	0	0	0	0	65	690
8:50 AM	0	0	0	0	15	0	0	0	55	0	0	0	0	0	0	0	70	684
8:55 AM	0	0	0	0	13	0	0	0	46	0	0	0	0	0	0	0	59	672

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	204	0	0	0	716	0	0	0	0	0	0	0	920
Heavy Trucks	0	0	0		16	0	0		60	0	0		0	0	0		76
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/14/2016 3:08 PM

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

Type of peak hour being reported: User-Defined

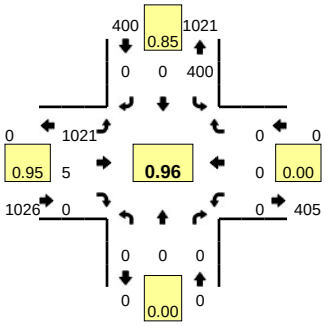
Method for determining peak hour: Total Entering Volume

LOCATION: SE 192nd Ave -- SR 14 EB Ramps

CITY/STATE: Camas, WA

QC JOB #: 13822510

DATE: Thu, May 26 2016

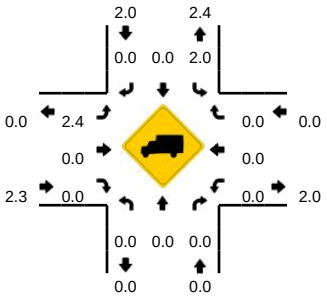


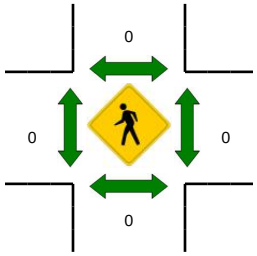
Peak-Hour: 4:35 PM -- 5:35 PM

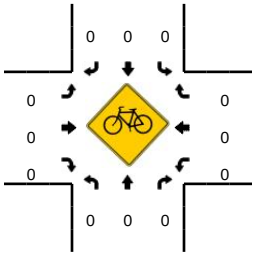
Peak 15-Min: 5:15 PM -- 5:30 PM

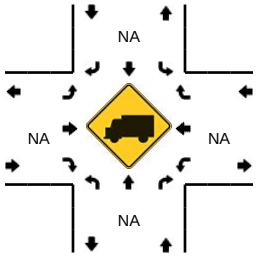
Quality Counts

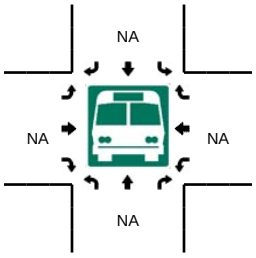
TRANSPORTATION DATA COLLECTION SERVICES











5-Min Count Period Beginning At	SE 192nd Ave (Northbound)				SE 192nd Ave (Southbound)				SR 14 EB Ramps (Eastbound)				SR 14 EB Ramps (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	28	0	0	0	82	0	0	0	0	0	0	0	110	
4:05 PM	0	0	0	0	26	0	0	0	76	1	0	0	0	0	0	0	103	
4:10 PM	0	0	0	0	38	0	0	0	90	0	0	0	0	0	0	0	128	
4:15 PM	0	0	0	0	44	0	0	0	93	0	0	0	0	0	0	0	137	
4:20 PM	0	0	0	0	36	0	0	0	68	0	0	0	0	0	0	0	104	
4:25 PM	0	0	0	0	33	0	0	0	87	0	0	0	0	0	0	0	120	
4:30 PM	0	0	0	0	24	0	0	0	76	0	0	0	0	0	0	0	100	
4:35 PM	0	0	0	0	30	0	0	0	96	0	0	0	0	0	0	0	126	
4:40 PM	0	0	0	0	38	0	0	0	66	1	0	0	0	0	0	0	105	
4:45 PM	0	0	0	0	33	0	0	0	94	0	0	0	0	0	0	0	127	
4:50 PM	0	0	0	0	38	0	0	0	72	1	0	0	0	0	0	0	111	
4:55 PM	0	0	0	0	20	0	0	0	95	0	0	0	0	0	0	0	115	1386
5:00 PM	0	0	0	0	31	0	0	0	83	1	0	0	0	0	0	0	115	1391
5:05 PM	0	0	0	0	33	0	0	0	84	1	0	0	0	0	0	0	118	1406
5:10 PM	0	0	0	0	36	0	0	0	78	1	0	0	0	0	0	0	115	1393
5:15 PM	0	0	0	0	40	0	0	0	84	0	0	0	0	0	0	0	124	1380
5:20 PM	0	0	0	0	42	0	0	0	77	0	0	0	0	0	0	0	119	1395
5:25 PM	0	0	0	0	23	0	0	0	107	0	0	0	0	0	0	0	130	1405
5:30 PM	0	0	0	0	36	0	0	0	85	0	0	0	0	0	0	0	121	1426
5:35 PM	0	0	0	0	37	0	0	0	71	0	0	0	0	0	0	0	108	1408
5:40 PM	0	0	0	0	38	0	0	0	80	0	0	0	0	0	0	0	118	1421
5:45 PM	0	0	0	0	28	0	0	0	76	0	0	0	0	0	0	0	104	1398
5:50 PM	0	0	0	0	39	0	0	0	80	0	0	0	0	0	0	0	119	1406
5:55 PM	0	0	0	0	27	0	0	0	83	0	0	0	0	0	0	0	110	1401

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	420	0	0	0	1072	0	0	0	0	0	0	0	1492
Heavy Trucks	0	0	0		8	0	0		20	0	0		0	0	0		28
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/14/2016 3:09 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 Brady Rd -- NW McIntosh Rd

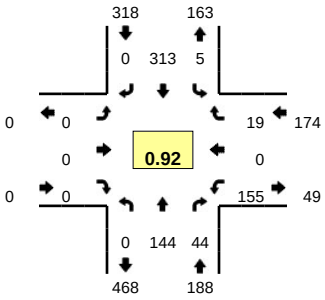
CITY/STATE: Camas, WA

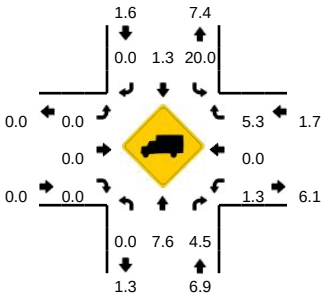
QC JOB #: 13918901

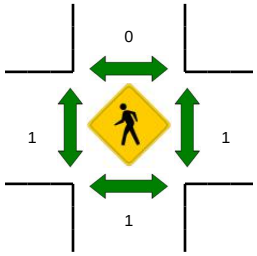
DATE: Tue, Oct 04 2016

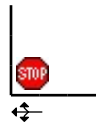
Peak-Hour: 8:00 AM -- 9:00 AM

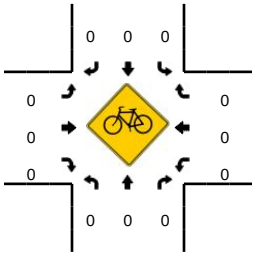
Peak 15-Min: 8:45 AM -- 9:00 AM

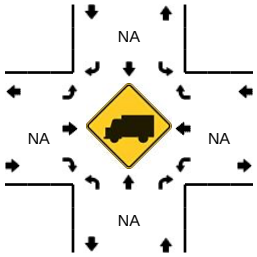


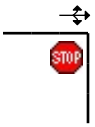


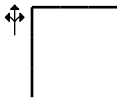


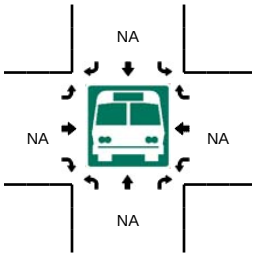












5-Min Count Period Beginning At	NW Brady Rd (Northbound)				NW Brady Rd (Southbound)				NW McIntosh Rd (Eastbound)				NW McIntosh Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	18	2	0	1	41	0	0	0	0	0	0	10	0	0	0	72	
7:05 AM	0	10	0	0	0	26	0	0	0	0	0	0	10	0	0	0	46	
7:10 AM	0	11	2	0	0	26	0	0	0	0	0	0	11	0	0	0	50	
7:15 AM	0	8	2	0	0	29	0	0	0	0	0	0	4	0	0	0	43	
7:20 AM	0	8	6	0	0	32	0	0	0	0	0	0	11	0	0	1	58	
7:25 AM	0	13	4	0	0	29	0	0	0	0	0	0	14	0	1	0	61	
7:30 AM	0	10	2	0	0	33	0	0	0	0	0	0	11	0	2	0	58	
7:35 AM	0	10	1	0	0	29	0	0	0	0	0	0	6	0	0	0	46	
7:40 AM	0	14	2	0	0	26	0	0	0	0	0	0	5	0	1	0	48	
7:45 AM	0	15	4	0	0	30	0	0	0	0	0	0	11	0	0	0	60	
7:50 AM	0	16	2	0	0	24	0	0	0	0	0	0	14	0	0	0	56	
7:55 AM	0	16	3	0	4	28	0	0	0	0	0	0	9	0	0	0	60	658
8:00 AM	0	18	0	0	2	26	0	0	0	0	0	0	7	0	2	0	55	641
8:05 AM	0	9	5	0	0	27	0	0	0	0	0	0	12	0	0	0	53	648
8:10 AM	0	10	3	0	0	23	0	0	0	0	0	0	9	0	2	0	47	645
8:15 AM	0	10	7	0	0	36	0	0	0	0	0	0	11	0	0	0	64	666
8:20 AM	0	9	3	0	2	25	0	0	0	0	0	0	15	0	1	0	55	663
8:25 AM	0	12	2	0	0	29	0	0	0	0	0	0	14	0	2	0	59	661
8:30 AM	0	12	4	0	0	18	0	0	0	0	0	0	12	0	2	0	48	651
8:35 AM	0	10	3	0	0	22	0	0	0	0	0	0	12	0	1	0	48	653
8:40 AM	0	15	3	0	0	29	0	0	0	0	0	0	18	0	1	0	66	671
8:45 AM	0	16	4	0	0	28	0	0	0	0	0	0	14	0	2	0	64	675
8:50 AM	0	11	5	0	0	18	0	0	0	0	0	0	17	0	3	0	54	673
8:55 AM	0	12	5	0	1	32	0	0	0	0	0	0	14	0	3	0	67	680

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	156	56	0	4	312	0	0	0	0	0	0	180	0	32	0	740
Heavy Trucks	0	8	0		0	8	0		0	0	0		0	0	0		16
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/11/2016 1:35 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 Brady Rd -- NW McIntosh Rd

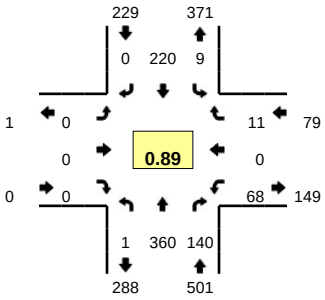
CITY/STATE: Camas, WA

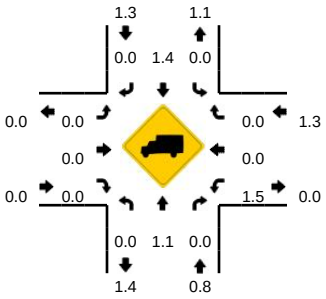
QC JOB #: 13918902

DATE: Tue, Oct 04 2016

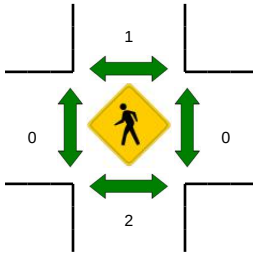
Peak-Hour: 5:00 PM -- 6:00 PM

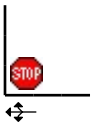
Peak 15-Min: 5:05 PM -- 5:20 PM

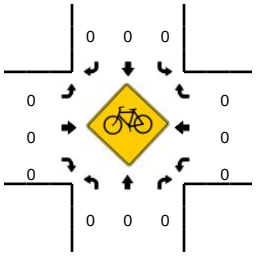


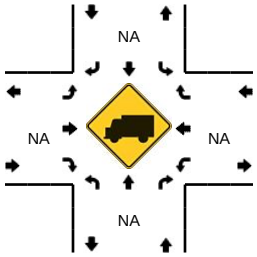


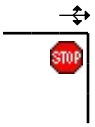
Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

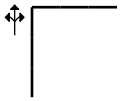


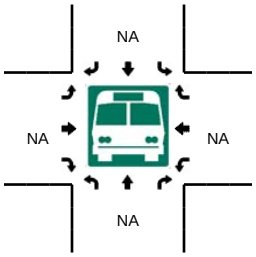












5-Min Count Period Beginning At	NW Brady Rd (Northbound)				NW Brady Rd (Southbound)				NW McIntosh Rd (Eastbound)				NW McIntosh Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	21	7	0	0	9	0	0	1	0	0	0	5	0	3	0	46	
4:05 PM	0	15	8	0	1	14	0	0	0	1	0	0	8	0	0	0	47	
4:10 PM	0	27	8	0	2	15	0	0	0	0	0	0	4	0	0	0	56	
4:15 PM	0	22	10	0	2	16	0	0	0	0	0	0	7	0	4	0	61	
4:20 PM	0	30	11	0	0	12	0	0	0	0	0	0	8	0	1	0	62	
4:25 PM	0	27	11	0	0	17	0	0	0	0	0	0	10	0	3	0	68	
4:30 PM	0	33	5	0	0	21	0	0	0	0	0	0	5	0	0	0	64	
4:35 PM	0	31	4	0	0	18	0	0	0	0	0	0	3	0	0	0	56	
4:40 PM	1	27	15	0	1	32	0	0	0	0	0	0	2	0	1	0	79	
4:45 PM	0	20	10	0	0	10	0	0	0	0	0	0	13	0	2	0	55	
4:50 PM	0	27	6	0	0	16	0	0	0	0	0	0	7	0	0	0	56	
4:55 PM	0	39	5	0	1	19	0	0	0	0	0	0	3	0	1	0	68	718
5:00 PM	0	22	11	0	1	13	0	0	0	0	0	0	7	0	0	0	54	726
5:05 PM	0	23	13	0	0	32	0	0	0	0	0	0	8	0	0	0	76	755
5:10 PM	0	42	12	0	1	19	0	0	0	0	0	0	3	0	1	0	78	777
5:15 PM	0	30	13	0	1	23	0	0	0	0	0	0	6	0	1	0	74	790
5:20 PM	0	25	7	0	0	19	0	0	0	0	0	0	9	0	3	0	63	791
5:25 PM	0	30	11	0	0	22	0	0	0	0	0	0	2	0	2	0	67	790
5:30 PM	1	27	15	0	1	14	0	0	0	0	0	0	3	0	0	0	61	787
5:35 PM	0	31	7	0	2	14	0	0	0	0	0	0	5	0	0	0	59	790
5:40 PM	0	36	16	0	1	17	0	0	0	0	0	0	4	0	1	0	75	786
5:45 PM	0	25	13	0	1	17	0	0	0	0	0	0	9	0	1	0	66	797
5:50 PM	0	37	9	0	1	11	0	0	0	0	0	0	7	0	1	0	66	807
5:55 PM	0	32	13	0	0	19	0	0	0	0	0	0	5	0	1	0	70	809

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	380	152	0	8	296	0	0	0	0	0	0	68	0	8	0	912
Heavy Trucks	0	4	0		0	4	0		0	0	0		4	0	0		12
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/11/2016 1:35 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 Sacajawea St -- NW McIntosh Rd

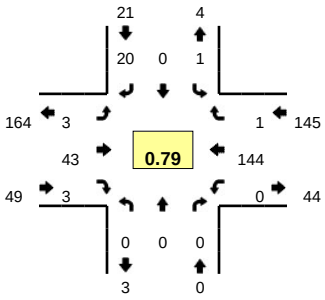
CITY/STATE: Camas, WA

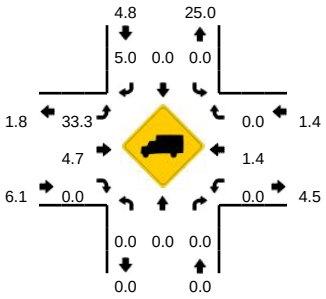
QC JOB #: 13918903

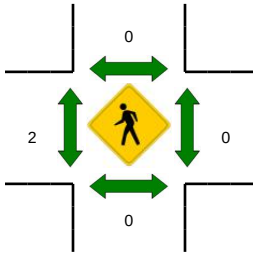
DATE: Tue, Oct 04 2016

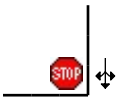
Peak-Hour: 8:00 AM -- 9:00 AM

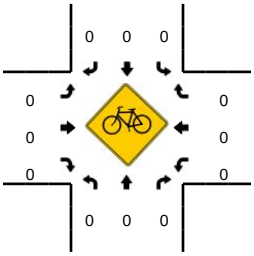
Peak 15-Min: 8:45 AM -- 9:00 AM

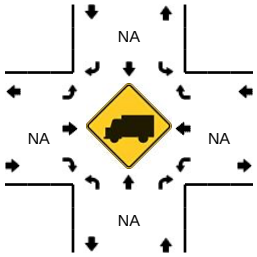


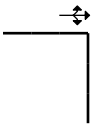


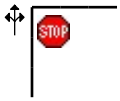


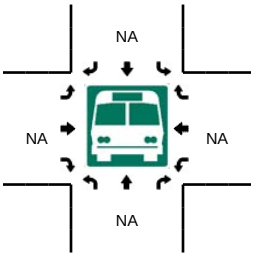












5-Min Count Period Beginning At	NW Sacajawea St (Northbound)				NW Sacajawea St (Southbound)				NW McIntosh Rd (Eastbound)				NW McIntosh Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	2	0	0	3	0	0	0	8	0	0	13	
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	9	
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	7	0	0	8	
7:15 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	4	0	0	7	
7:20 AM	0	0	0	0	0	0	0	0	0	7	0	0	0	12	0	0	19	
7:25 AM	0	0	0	0	0	0	0	0	1	2	0	0	0	13	0	0	16	
7:30 AM	0	0	0	0	0	0	1	0	0	2	0	0	0	9	0	0	12	
7:35 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	6	0	0	7	
7:40 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	6	0	0	8	
7:45 AM	0	0	0	0	0	0	1	0	0	4	0	0	0	9	0	0	14	
7:50 AM	0	0	0	0	0	0	1	0	0	2	0	0	0	11	0	0	14	
7:55 AM	0	0	0	0	0	0	1	0	0	5	0	0	0	10	0	0	16	143
8:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	6	0	0	8	138
8:05 AM	0	0	0	0	0	0	1	0	0	3	0	0	0	10	0	0	14	143
8:10 AM	0	0	0	0	0	0	1	0	1	3	0	0	0	8	1	0	14	149
8:15 AM	0	0	0	0	0	0	1	0	0	7	0	0	0	11	0	0	19	161
8:20 AM	0	0	0	0	0	0	5	0	0	4	1	0	0	9	0	0	19	161
8:25 AM	0	0	0	0	0	0	1	0	0	2	1	0	0	16	0	0	20	165
8:30 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	15	0	0	19	172
8:35 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	12	0	0	15	180
8:40 AM	0	0	0	0	1	0	2	0	0	2	0	0	0	14	0	0	19	191
8:45 AM	0	0	0	0	0	0	3	0	1	5	0	0	0	12	0	0	21	198
8:50 AM	0	0	0	0	0	0	2	0	1	2	0	0	0	18	0	0	23	207
8:55 AM	0	0	0	0	0	0	3	0	0	7	1	0	0	13	0	0	24	215

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	0	0	32	0	8	56	4	0	0	172	0	0	272
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/11/2016 1:35 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 Sacajawea St -- NW McIntosh Rd

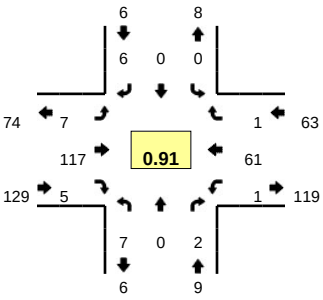
CITY/STATE: Camas, WA

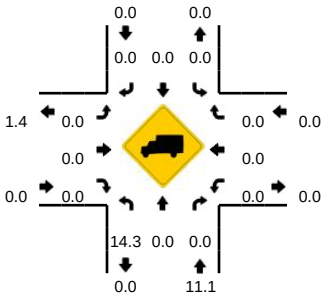
QC JOB #: 13918904

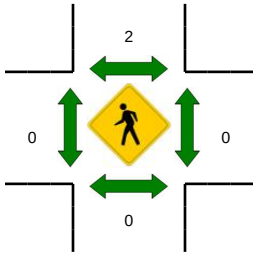
DATE: Tue, Oct 04 2016

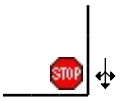
Peak-Hour: 5:00 PM -- 6:00 PM

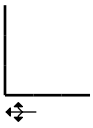
Peak 15-Min: 5:40 PM -- 5:55 PM

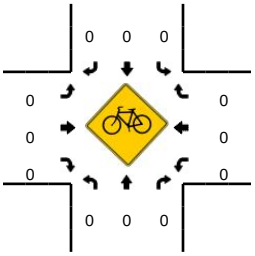


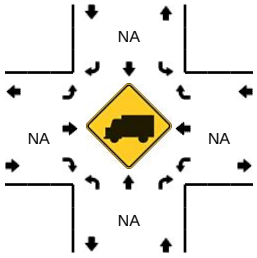


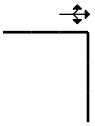


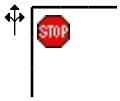


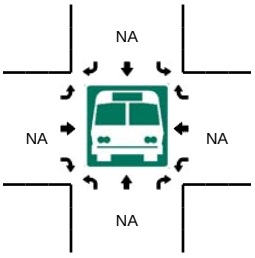












5-Min Count Period Beginning At	NW Sacajawea St (Northbound)				NW Sacajawea St (Southbound)				NW McIntosh Rd (Eastbound)				NW McIntosh Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	2	0	0	4	0	0	0	6	0	0	12	
4:05 PM	0	0	0	0	0	0	1	0	1	8	0	0	0	9	0	0	19	
4:10 PM	0	0	0	0	0	0	1	0	1	8	1	0	1	5	0	0	17	
4:15 PM	1	0	1	0	0	0	0	0	1	6	2	0	1	7	0	0	19	
4:20 PM	0	0	0	0	0	0	2	0	2	10	0	0	0	7	0	0	21	
4:25 PM	0	0	0	0	0	0	1	0	0	10	0	0	0	10	0	0	21	
4:30 PM	0	0	0	0	0	0	0	0	1	3	0	0	0	2	0	0	6	
4:35 PM	0	0	0	0	0	0	0	0	0	3	1	0	0	3	0	0	7	
4:40 PM	0	0	0	0	0	0	0	0	1	11	0	0	0	6	0	0	18	
4:45 PM	0	0	0	0	0	0	1	0	1	9	0	0	0	9	0	0	20	
4:50 PM	0	0	0	0	0	0	0	0	1	3	0	0	0	7	0	0	11	
4:55 PM	0	0	0	0	0	0	1	0	1	5	0	0	0	2	0	0	9	180
5:00 PM	0	0	0	0	0	0	1	0	0	8	0	0	0	7	0	0	16	184
5:05 PM	0	0	0	0	0	0	1	0	0	11	1	0	0	5	0	0	18	183
5:10 PM	2	0	0	0	0	0	0	0	0	9	1	0	0	4	0	0	16	182
5:15 PM	1	0	1	0	0	0	0	0	0	9	2	0	0	3	0	0	16	179
5:20 PM	1	0	0	0	0	0	0	0	1	9	0	0	0	12	0	0	23	181
5:25 PM	1	0	0	0	0	0	1	0	0	10	0	0	1	2	0	0	15	175
5:30 PM	1	0	0	0	0	0	0	0	1	10	0	0	0	3	0	0	15	184
5:35 PM	0	0	1	0	0	0	1	0	0	8	0	0	0	4	0	0	14	191
5:40 PM	0	0	0	0	0	0	0	0	2	13	1	0	0	2	0	0	18	191
5:45 PM	1	0	0	0	0	0	1	0	2	11	0	0	0	8	0	0	23	194
5:50 PM	0	0	0	0	0	0	1	0	0	8	0	0	0	7	0	0	16	199
5:55 PM	0	0	0	0	0	0	0	0	1	11	0	0	0	4	1	0	17	207

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	4	0	0	0	0	0	8	0	16	128	4	0	0	68	0	0	228
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/11/2016 1:35 PM

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

Appendix D

Existing Traffic Operations Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	9	11	502	10	36	11	595	197	23	624	2
Future Volume (vph)	1	9	11	502	10	36	11	595	197	23	624	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.88		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	940		1770	1383		992	3406	1455	1543	3505	1615
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	940		1770	1383		992	3406	1455	1543	3505	1615
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	1	10	13	577	11	41	13	684	226	26	717	2
RTOR Reduction (vph)	0	12	0	0	24	0	0	0	164	0	0	1
Lane Group Flow (vph)	1	11	0	577	28	0	13	684	62	26	717	1
Heavy Vehicles (%)	0%	89%	82%	2%	100%	0%	82%	6%	11%	17%	3%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)	0.7	2.8		26.6	28.7		1.0	19.5	19.5	2.0	20.5	20.5
Effective Green, g (s)	0.7	2.8		26.6	28.7		1.0	19.5	19.5	2.0	20.5	20.5
Actuated g/C Ratio	0.01	0.04		0.38	0.40		0.01	0.28	0.28	0.03	0.29	0.29
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	17	37		664	559		13	936	400	43	1013	466
v/s Ratio Prot	0.00	c0.01		c0.33	0.02		0.01	0.20		c0.02	c0.20	
v/s Ratio Perm									0.04			0.00
v/c Ratio	0.06	0.28		0.87	0.05		1.00	0.73	0.16	0.60	0.71	0.00
Uniform Delay, d1	34.8	33.1		20.5	12.8		35.0	23.3	19.5	34.1	22.5	17.9
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	1.5		11.3	0.0		249.6	2.6	0.1	15.3	1.9	0.0
Delay (s)	35.3	34.6		31.8	12.8		284.6	25.9	19.5	49.4	24.4	17.9
Level of Service	D	C		C	B		F	C	B	D	C	B
Approach Delay (s)		34.6			30.3			28.0			25.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	70.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	2	236	0	567	0	0	188	949
Future Volume (Veh/h)	0	0	0	0	2	236	0	567	0	0	188	949
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	0	0	2	265	0	637	0	0	211	1066
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								298			555	
pX, platoon unblocked	0.82	0.82	0.82	0.82	0.82		0.82					
vC, conflicting volume	530	848	211	848	848	318	211			637		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	317	705	0	705	705	318	0			637		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	7.0	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	100	100	100	100	99	60	100			100		
cM capacity (veh/h)	303	298	894	268	298	666	1341			956		

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	267	0	318	318	566	711
Volume Left	0	0	0	0	0	0
Volume Right	265	0	0	0	355	711
cSH	671	1700	1700	1700	1700	1700
Volume to Capacity	0.40	0.00	0.19	0.19	0.33	0.42
Queue Length 95th (ft)	48	0	0	0	0	0
Control Delay (s)	14.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	14.0	0.0			0.0	
Approach LOS	B					

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	66.8%	ICU Level of Service	C	
Analysis Period (min)	15			

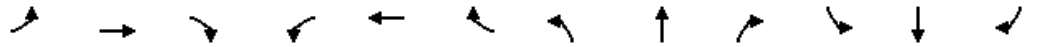
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	567	0	0	0	188	0
Future Volume (vph)	567	0	0	0	188	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			4.0	
Lane Util. Factor	0.95	0.95			1.00	
Frt	1.00	1.00			1.00	
Flt Protected	0.95	0.95			0.95	
Satd. Flow (prot)	1573	1573			1719	
Flt Permitted	0.95	0.95			0.95	
Satd. Flow (perm)	1573	1573			1719	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	691	0	0	0	229	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	345	346	0	0	229	0
Heavy Vehicles (%)	9%	0%	0%	0%	5%	0%
Turn Type	Perm	NA			Prot	
Protected Phases		8			2	
Permitted Phases	8					
Actuated Green, G (s)	35.1	35.1			13.1	
Effective Green, g (s)	35.1	35.1			13.1	
Actuated g/C Ratio	0.61	0.61			0.23	
Clearance Time (s)	5.0	5.0			4.0	
Vehicle Extension (s)	3.5	3.5			3.5	
Lane Grp Cap (vph)	965	965			393	
v/s Ratio Prot					c0.13	
v/s Ratio Perm	0.22	0.22				
v/c Ratio	0.36	0.36			0.58	
Uniform Delay, d1	5.5	5.5			19.6	
Progression Factor	1.00	1.00			1.00	
Incremental Delay, d2	1.0	1.0			2.3	
Delay (s)	6.5	6.5			22.0	
Level of Service	A	A			C	
Approach Delay (s)		6.5	0.0		22.0	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	57.2	Sum of lost time (s)	9.0
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	116	6	148	33	6	339
Future Volume (Veh/h)	116	6	148	33	6	339
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	141	7	180	40	7	413
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	627	200			220	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	627	200			220	
tC, single (s)	6.5	6.4			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.5			2.3	
p0 queue free %	68	99			99	
cM capacity (veh/h)	439	804			1314	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	148	220	7	413
Volume Left	141	0	7	0
Volume Right	7	40	0	0
cSH	448	1700	1314	1700
Volume to Capacity	0.33	0.13	0.01	0.24
Queue Length 95th (ft)	36	0	0	0
Control Delay (s)	16.9	0.0	7.8	0.0
Lane LOS	C		A	
Approach Delay (s)	16.9	0.0	0.1	
Approach LOS	C			

Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	31.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	32	0	1	103	0	0	0	0	0	0	6
Future Volume (Veh/h)	1	32	0	1	103	0	0	0	0	0	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	1	39	0	1	126	0	0	0	0	0	0	7
Pedestrians					1			1			1	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	127			40			177	171	41	171	171	127
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	127			40			177	171	41	171	171	127
tC, single (s)	4.1			4.2			7.1	7.5	6.2	7.2	7.0	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.9	3.3	3.6	4.5	3.3
p0 queue free %	100			100			100	100	100	100	100	99
cM capacity (veh/h)	1470			1543			774	575	1034	776	642	928

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	40	127	0	7
Volume Left	1	1	0	0
Volume Right	0	0	0	7
cSH	1470	1543	1700	928
Volume to Capacity	0.00	0.00	0.00	0.01
Queue Length 95th (ft)	0	0	0	1
Control Delay (s)	0.2	0.1	0.0	8.9
Lane LOS	A	A	A	A
Approach Delay (s)	0.2	0.1	0.0	8.9
Approach LOS			A	A

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	16.4%	ICU Level of Service	A	
Analysis Period (min)	15			

1: SE 192nd Ave & SE Brady Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.3	0.0	0.1	0.3
Denied Del/Veh (s)	0.2	1.3	0.0	0.3	0.5
Total Delay (hr)	0.1	3.0	2.2	2.2	7.5
Total Del/Veh (s)	19.9	15.2	9.6	12.3	12.3
Vehicles Entered	23	700	824	652	2199

2: SE 192nd Ave & SR 14 WB Ramps Performance by approach

Approach	WB	NB	SB	All
Denied Delay (hr)	0.2	0.0	0.0	0.2
Denied Del/Veh (s)	3.4	0.0	0.0	0.4
Total Delay (hr)	0.4	0.1	1.2	1.7
Total Del/Veh (s)	6.8	0.5	3.6	3.1
Vehicles Entered	230	603	1152	1985

3: SR 14 EB Ramps & SE 192nd Ave Performance by approach

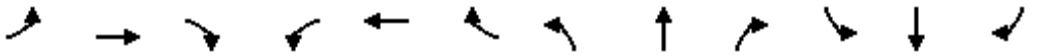
Approach	EB	SB	All
Denied Delay (hr)	0.0	0.0	0.0
Denied Del/Veh (s)	0.2	0.1	0.1
Total Delay (hr)	1.2	0.9	2.1
Total Del/Veh (s)	7.2	18.1	9.8
Vehicles Entered	589	184	773

4: SE Brady Rd & NW McIntosh Rd Performance by approach

Approach	WB	NB	SB	All
Denied Delay (hr)	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.1	0.4	0.2
Total Delay (hr)	0.4	0.1	0.1	0.6
Total Del/Veh (s)	13.0	0.9	0.7	2.6
Vehicles Entered	118	339	346	803

5: Sacajawea St & NW McIntosh Rd Performance by approach

Approach	EB	WB	SB	All
Denied Delay (hr)	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.1	0.1	0.1
Total Delay (hr)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.1	2.8	0.2
Vehicles Entered	35	100	6	141



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	12	2	305	10	48	2	824	461	59	968	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.98		1.00	0.88		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	991		1770	1425		992	3406	1455	1543	3505	1615
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	991		1770	1425		992	3406	1455	1543	3505	1615
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	2	14	2	351	11	55	2	947	530	68	1113	3
RTOR Reduction (vph)	0	2	0	0	40	0	0	0	252	0	0	2
Lane Group Flow (vph)	2	14	0	351	26	0	2	947	278	68	1113	1
Heavy Vehicles (%)	0%	89%	82%	2%	100%	0%	82%	6%	11%	17%	3%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)	0.7	2.7		18.6	20.6		0.7	28.4	28.4	5.7	33.4	33.4
Effective Green, g (s)	0.7	2.7		18.6	20.6		0.7	28.4	28.4	5.7	33.4	33.4
Actuated g/C Ratio	0.01	0.04		0.25	0.27		0.01	0.38	0.38	0.08	0.44	0.44
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	16	35		436	389		9	1282	548	116	1552	715
v/s Ratio Prot	0.00	c0.01		c0.20	0.02		0.00	0.28		c0.04	c0.32	
v/s Ratio Perm									0.19			0.00
v/c Ratio	0.12	0.40		0.81	0.07		0.22	0.74	0.51	0.59	0.72	0.00
Uniform Delay, d1	37.0	35.6		26.7	20.3		37.1	20.3	18.1	33.7	17.1	11.7
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	1.3	2.7		9.8	0.0		4.5	2.0	0.3	4.8	1.3	0.0
Delay (s)	38.3	38.3		36.5	20.3		41.6	22.2	18.4	38.5	18.5	11.7
Level of Service	D	D		D	C		D	C	B	D	B	B
Approach Delay (s)		38.3			33.9			20.9			19.6	
Approach LOS		D			C			C			B	

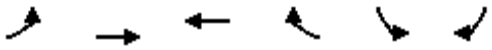
Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	1	3	289	2	998	0	0	402	873
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	0	1	3	325	2	1121	0	0	452	981
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								298			555	
pX, platoon unblocked	0.73	0.73	0.73	0.73	0.73		0.73					
vC, conflicting volume	1019	1578	452	1578	1578	561	452			1121		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	843	1606	69	1606	1606	561	69			1121		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	7.0	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	100	100	100	98	96	30	100			100		
cM capacity (veh/h)	54	78	722	52	78	461	1132			630		

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	329	2	561	561	779	654
Volume Left	1	2	0	0	0	0
Volume Right	325	0	0	0	327	654
cSH	468	1132	1700	1700	1700	1700
Volume to Capacity	0.70	0.00	0.33	0.33	0.46	0.38
Queue Length 95th (ft)	136	0	0	0	0	0
Control Delay (s)	29.7	8.2	0.0	0.0	0.0	0.0
Lane LOS	D	A				
Approach Delay (s)	29.7	0.0			0.0	
Approach LOS	D					

Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	81.9%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	1000	3	0	0	403	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			4.0	
Lane Util. Factor	0.95	0.95			1.00	
Frt	1.00	1.00			1.00	
Flt Protected	0.95	0.95			0.95	
Satd. Flow (prot)	1573	1578			1719	
Flt Permitted	0.95	0.95			0.95	
Satd. Flow (perm)	1573	1578			1719	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	1220	4	0	0	491	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	610	614	0	0	491	0
Heavy Vehicles (%)	9%	0%	0%	0%	5%	0%
Turn Type	Perm	NA			Prot	
Protected Phases		8			2	
Permitted Phases	8					
Actuated Green, G (s)	35.1	35.1			22.8	
Effective Green, g (s)	35.1	35.1			22.8	
Actuated g/C Ratio	0.52	0.52			0.34	
Clearance Time (s)	5.0	5.0			4.0	
Vehicle Extension (s)	3.5	3.5			3.5	
Lane Grp Cap (vph)	825	827			585	
v/s Ratio Prot					c0.29	
v/s Ratio Perm	0.39	0.39				
v/c Ratio	0.74	0.74			0.84	
Uniform Delay, d1	12.3	12.4			20.4	
Progression Factor	1.00	1.00			1.00	
Incremental Delay, d2	5.9	6.0			10.5	
Delay (s)	18.2	18.3			30.9	
Level of Service	B	B			C	
Approach Delay (s)		18.3	0.0		30.9	
Approach LOS		B	A		C	

Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	66.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	66	11	367	132	10	220
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	75	12	417	150	11	250
Pedestrians			2			1
Lane Width (ft)			12.0			12.0
Walking Speed (ft/s)			3.5			3.5
Percent Blockage			0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	767	493			567	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	767	493			567	
tC, single (s)	6.5	6.4			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.5			2.3	
p0 queue free %	79	98			99	
cM capacity (veh/h)	360	546			976	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	88	567	11	250
Volume Left	75	0	11	0
Volume Right	12	150	0	0
cSH	378	1700	976	1700
Volume to Capacity	0.23	0.33	0.01	0.15
Queue Length 95th (ft)	22	0	1	0
Control Delay (s)	17.4	0.0	8.7	0.0
Lane LOS	C		A	
Approach Delay (s)	17.4	0.0	0.4	
Approach LOS	C			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	38.7%	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)	7	111	5	1	59	0	7	0	2	0	0	7
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)	8	128	6	1	68	0	8	0	2	0	0	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	68			133			225	217	130	219	220	68
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	68			133			225	217	130	219	220	68
tC, single (s)	4.1			4.2			7.1	7.5	6.2	7.2	7.0	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.9	3.3	3.6	4.5	3.3
p0 queue free %	99			100			99	100	100	100	100	99
cM capacity (veh/h)	1546			1427			720	537	925	719	599	1001

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	141	69	10	8
Volume Left	8	1	8	0
Volume Right	6	0	2	8
cSH	1546	1427	757	1001
Volume to Capacity	0.01	0.00	0.01	0.01
Queue Length 95th (ft)	0	0	1	1
Control Delay (s)	0.5	0.1	9.8	8.6
Lane LOS	A	A	A	A
Approach Delay (s)	0.5	0.1	9.8	8.6
Approach LOS			A	A

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	23.1%	ICU Level of Service	A	
Analysis Period (min)	15			

1: SE 192nd Ave & SE Brady Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.2	0.0	0.1	0.3
Denied Del/Veh (s)	0.6	1.4	0.0	0.5	0.4
Total Delay (hr)	0.1	2.0	3.6	2.8	8.4
Total Del/Veh (s)	28.4	15.1	9.8	9.7	10.7
Vehicles Entered	14	462	1307	1018	2801

2: SE 192nd Ave & SR 14 WB Ramps Performance by approach

Approach	WB	NB	SB	All
Denied Delay (hr)	0.3	0.0	0.0	0.3
Denied Del/Veh (s)	3.3	0.0	0.0	0.4
Total Delay (hr)	1.3	0.3	1.7	3.3
Total Del/Veh (s)	15.9	0.9	4.9	4.6
Vehicles Entered	299	1030	1274	2603

3: SR 14 EB Ramps & SE 192nd Ave Performance by approach

Approach	EB	SB	All
Denied Delay (hr)	0.1	0.0	0.1
Denied Del/Veh (s)	0.3	0.1	0.2
Total Delay (hr)	3.9	2.4	6.3
Total Del/Veh (s)	13.8	21.1	15.9
Vehicles Entered	1007	402	1409

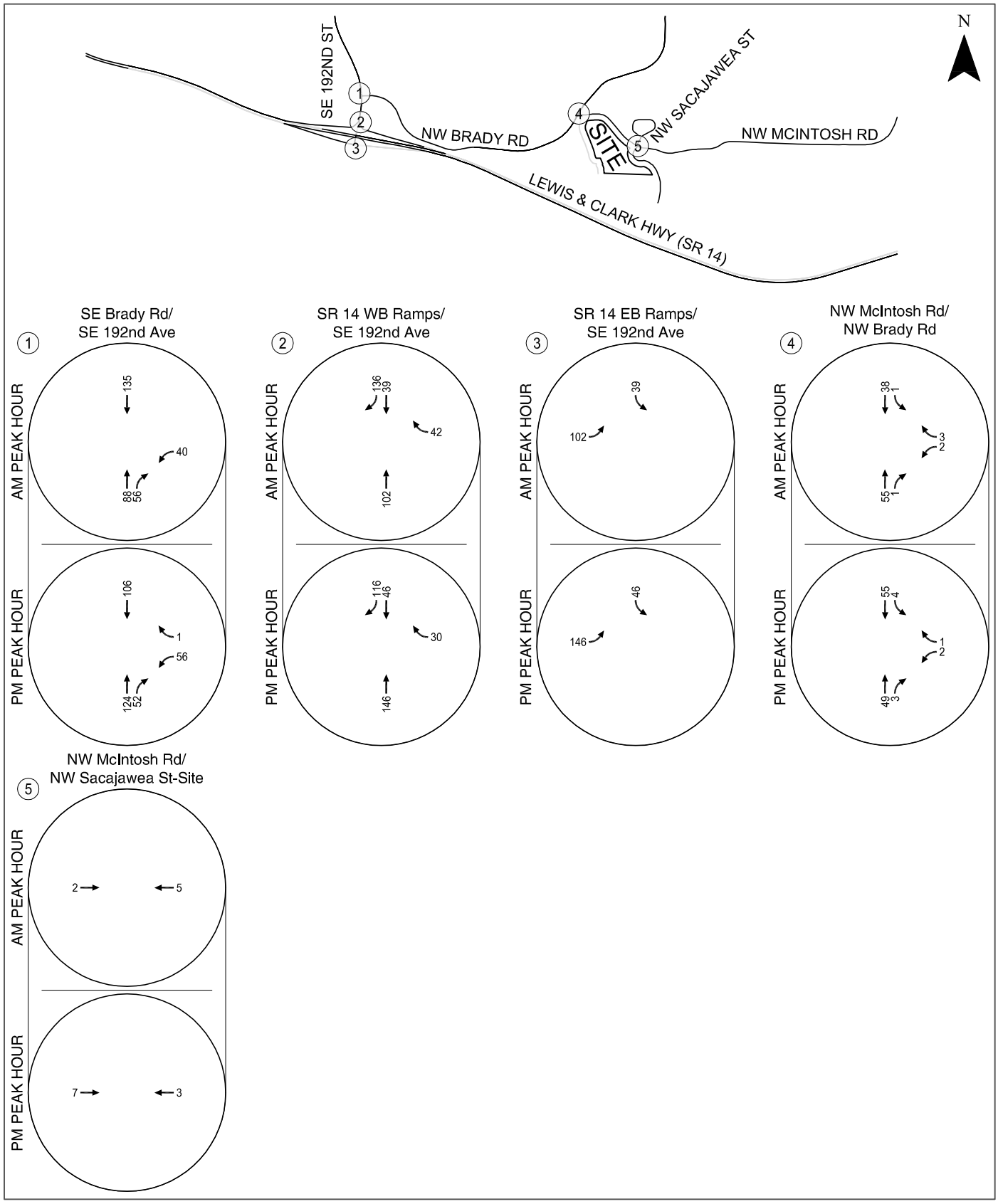
4: NW Brady Rd & NW McIntosh Rd Performance by approach

Approach	WB	NB	SB	All
Denied Delay (hr)	0.0	0.1	0.0	0.1
Denied Del/Veh (s)	0.0	0.3	0.4	0.3
Total Delay (hr)	0.3	0.7	0.0	1.1
Total Del/Veh (s)	15.7	2.8	0.8	3.3
Vehicles Entered	77	852	229	1158

5: NW Sacajawea St & NW McIntosh Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.1	0.1	0.1	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.6	0.1	4.0	2.8	0.7
Vehicles Entered	149	58	10	8	225

Appendix E
In-process Volumes



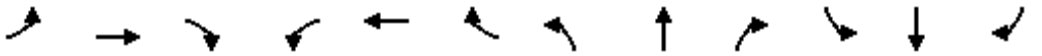
CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = CRITICAL MOVEMENT LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL CRITICAL VOLUME-TO-CAPACITY RATIO

In-Process Traffic Volumes
Weekday AM and PM Peak Hours
Camas, Washington

Figure
E-1

Appendix F

Year 2018 Background Traffic Operations Analysis Worksheets



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	9	11	542	10	36	11	683	253	23	759	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.88		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	940		1770	1383		992	3406	1455	1543	3505	1615
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	940		1770	1383		992	3406	1455	1543	3505	1615
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	1	10	13	623	11	41	13	785	291	26	872	2
RTOR Reduction (vph)	0	12	0	0	25	0	0	0	190	0	0	1
Lane Group Flow (vph)	1	11	0	623	27	0	13	785	101	26	872	1
Heavy Vehicles (%)	0%	89%	82%	2%	100%	0%	82%	6%	11%	17%	3%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)	0.7	2.9		26.7	28.9		1.0	21.0	21.0	2.0	22.0	22.0
Effective Green, g (s)	0.7	2.9		26.7	28.9		1.0	21.0	21.0	2.0	22.0	22.0
Actuated g/C Ratio	0.01	0.04		0.37	0.40		0.01	0.29	0.29	0.03	0.30	0.30
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	17	37		650	550		13	985	420	42	1062	489
v/s Ratio Prot	0.00	c0.01		c0.35	0.02		0.01	0.23		c0.02	c0.25	
v/s Ratio Perm									0.07			0.00
v/c Ratio	0.06	0.28		0.96	0.05		1.00	0.80	0.24	0.62	0.82	0.00
Uniform Delay, d1	35.6	33.8		22.4	13.4		35.8	23.8	19.7	34.9	23.5	17.6
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	1.5		24.9	0.0		249.6	4.2	0.1	17.6	5.0	0.0
Delay (s)	36.2	35.4		47.3	13.4		285.4	28.1	19.8	52.5	28.4	17.6
Level of Service	D	D		D	B		F	C	B	D	C	B
Approach Delay (s)		35.4			44.7			28.9			29.1	
Approach LOS		D			D			C			C	

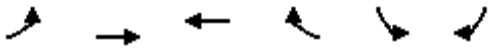
Intersection Summary			
HCM 2000 Control Delay	33.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	72.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	2	278	0	669	0	0	227	1085
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	0	0	2	312	0	752	0	0	255	1219
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								298			555	
pX, platoon unblocked	0.77	0.77	0.77	0.77	0.77		0.77					
vC, conflicting volume	632	1007	255	1007	1007	376	255			752		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	371	859	0	859	859	376	0			752		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	7.0	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	100	100	100	100	99	49	100			100		
cM capacity (veh/h)	211	228	839	195	228	610	1259			867		

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	315	0	376	376	661	813
Volume Left	0	0	0	0	0	0
Volume Right	312	0	0	0	406	813
cSH	615	1700	1700	1700	1700	1700
Volume to Capacity	0.51	0.00	0.22	0.22	0.39	0.48
Queue Length 95th (ft)	73	0	0	0	0	0
Control Delay (s)	16.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	16.9	0.0			0.0	
Approach LOS	C					

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	77.9%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	669	0	0	0	227	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			4.0	
Lane Util. Factor	0.95	0.95			1.00	
Frt	1.00	1.00			1.00	
Flt Protected	0.95	0.95			0.95	
Satd. Flow (prot)	1573	1573			1719	
Flt Permitted	0.95	0.95			0.95	
Satd. Flow (perm)	1573	1573			1719	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	816	0	0	0	277	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	408	408	0	0	277	0
Heavy Vehicles (%)	9%	0%	0%	0%	5%	0%
Turn Type	Perm	NA			Prot	
Protected Phases		8			2	
Permitted Phases	8					
Actuated Green, G (s)	35.2	35.2			15.0	
Effective Green, g (s)	35.2	35.2			15.0	
Actuated g/C Ratio	0.59	0.59			0.25	
Clearance Time (s)	5.0	5.0			4.0	
Vehicle Extension (s)	3.5	3.5			3.5	
Lane Grp Cap (vph)	935	935			435	
v/s Ratio Prot					c0.16	
v/s Ratio Perm	c0.26	0.26				
v/c Ratio	0.44	0.44			0.64	
Uniform Delay, d1	6.6	6.6			19.7	
Progression Factor	1.00	1.00			1.00	
Incremental Delay, d2	1.5	1.5			3.2	
Delay (s)	8.1	8.1			22.9	
Level of Service	A	A			C	
Approach Delay (s)		8.1	0.0		22.9	
Approach LOS		A	A		C	

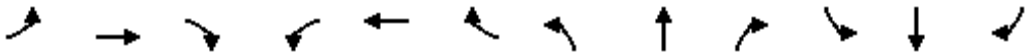
Intersection Summary			
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	59.2	Sum of lost time (s)	9.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	118	9	203	34	7	377
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	144	11	248	41	9	460
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	745	268			289	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	745	268			289	
tC, single (s)	6.5	6.4			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.5			2.3	
p0 queue free %	61	99			99	
cM capacity (veh/h)	373	736			1239	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	155	289	9	460
Volume Left	144	0	9	0
Volume Right	11	41	0	0
cSH	387	1700	1239	1700
Volume to Capacity	0.40	0.17	0.01	0.27
Queue Length 95th (ft)	47	0	1	0
Control Delay (s)	20.4	0.0	7.9	0.0
Lane LOS	C		A	
Approach Delay (s)	20.4	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	33.6%	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	34	0	1	108	0	0	0	0	0	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	1	41	0	1	132	0	0	0	0	0	0	7
Pedestrians					1			1			1	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	133			42			186	180	43	180	180	133
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	133			42			186	180	43	180	180	133
tC, single (s)	4.1			4.2			7.1	7.5	6.2	7.2	7.0	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.9	3.3	3.6	4.5	3.3
p0 queue free %	100			100			100	100	100	100	100	99
cM capacity (veh/h)	1463			1540			763	567	1031	765	634	921

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	43	133	0	7
Volume Left	1	1	0	0
Volume Right	0	0	0	7
cSH	1463	1540	1700	921
Volume to Capacity	0.00	0.00	0.00	0.01
Queue Length 95th (ft)	0	0	0	1
Control Delay (s)	0.2	0.1	0.0	8.9
Lane LOS	A	A	A	A
Approach Delay (s)	0.2	0.1	0.0	8.9
Approach LOS			A	A

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	16.7%	ICU Level of Service	A	
Analysis Period (min)	15			

1: SE 192nd Ave & SE Brady Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.3	0.0	0.1	0.4
Denied Del/Veh (s)	0.2	1.5	0.0	0.3	0.5
Total Delay (hr)	0.1	3.9	2.7	3.0	9.7
Total Del/Veh (s)	20.1	18.3	10.1	13.8	13.8
Vehicles Entered	18	760	940	787	2505

2: SE 192nd Ave & SR 14 WB Ramps Performance by approach

Approach	WB	NB	SB	All
Denied Delay (hr)	0.3	0.0	0.0	0.3
Denied Del/Veh (s)	3.4	0.0	0.0	0.4
Total Delay (hr)	0.7	0.1	1.6	2.3
Total Del/Veh (s)	8.4	0.6	4.2	3.7
Vehicles Entered	280	672	1320	2272

3: SR 14 EB Ramps & SE 192nd Ave Performance by approach

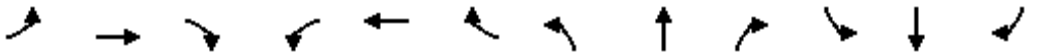
Approach	EB	SB	All
Denied Delay (hr)	0.0	0.0	0.0
Denied Del/Veh (s)	0.2	0.0	0.1
Total Delay (hr)	1.5	1.2	2.7
Total Del/Veh (s)	8.1	18.4	10.8
Vehicles Entered	658	229	887

4: SE Brady Rd & NW McIntosh Rd Performance by approach

Approach	WB	NB	SB	All
Denied Delay (hr)	0.0	0.0	0.0	0.1
Denied Del/Veh (s)	0.0	0.1	0.4	0.2
Total Delay (hr)	0.5	0.1	0.1	0.7
Total Del/Veh (s)	13.4	1.0	0.8	2.5
Vehicles Entered	122	447	378	947

5: Sacajawea St & NW McIntosh Rd Performance by approach

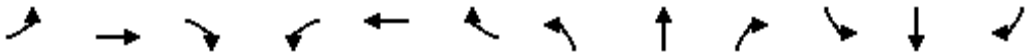
Approach	EB	WB	SB	All
Denied Delay (hr)	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.1	0.1	0.1
Total Delay (hr)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.1	2.8	0.3
Vehicles Entered	40	105	6	151



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	12	2	361	10	49	2	948	513	59	1074	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.98		1.00	0.87		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	991		1770	1427		992	3406	1455	1543	3505	1615
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	991		1770	1427		992	3406	1455	1543	3505	1615
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	2	14	2	415	11	56	2	1090	590	68	1234	3
RTOR Reduction (vph)	0	2	0	0	40	0	0	0	236	0	0	2
Lane Group Flow (vph)	2	14	0	415	27	0	2	1090	354	68	1234	1
Heavy Vehicles (%)	0%	89%	82%	2%	100%	0%	82%	6%	11%	17%	3%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)	0.8	3.2		22.3	24.7		0.8	34.0	34.0	6.0	39.2	39.2
Effective Green, g (s)	0.8	3.2		22.3	24.7		0.8	34.0	34.0	6.0	39.2	39.2
Actuated g/C Ratio	0.01	0.04		0.26	0.29		0.01	0.40	0.40	0.07	0.46	0.46
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	16	37		461	412		9	1354	578	108	1606	740
v/s Ratio Prot	0.00	c0.01		c0.23	0.02		0.00	0.32		c0.04	c0.35	
v/s Ratio Perm									0.24			0.00
v/c Ratio	0.12	0.38		0.90	0.07		0.22	0.81	0.61	0.63	0.77	0.00
Uniform Delay, d1	42.0	40.2		30.5	22.0		42.0	22.8	20.5	38.7	19.4	12.5
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	1.3	2.4		20.0	0.0		4.5	3.4	1.4	8.0	2.0	0.0
Delay (s)	43.3	42.6		50.5	22.1		46.6	26.2	21.9	46.7	21.4	12.5
Level of Service	D	D		D	C		D	C	C	D	C	B
Approach Delay (s)		42.6			46.6			24.7			22.7	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	85.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		

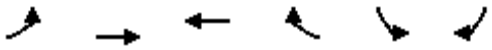
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	1	3	319	2	1144	0	0	448	989
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	0	1	3	358	2	1285	0	0	503	1111
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								298			555	
pX, platoon unblocked	0.69	0.69	0.69	0.69	0.69		0.69					
vC, conflicting volume	1152	1793	503	1793	1793	643	503			1285		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	999	1923	64	1923	1923	643	64			1285		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	7.0	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	100	100	100	96	93	12	100			100		
cM capacity (veh/h)	16	47	690	29	47	407	1077			546		

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	363	2	643	643	874	741
Volume Left	1	2	0	0	0	0
Volume Right	358	0	0	0	370	741
cSH	412	1077	1700	1700	1700	1700
Volume to Capacity	0.88	0.00	0.38	0.38	0.51	0.44
Queue Length 95th (ft)	225	0	0	0	0	0
Control Delay (s)	52.7	8.4	0.0	0.0	0.0	0.0
Lane LOS	F	A				
Approach Delay (s)	52.7	0.0			0.0	
Approach LOS	F					

Intersection Summary				
Average Delay	5.9			
Intersection Capacity Utilization	92.6%	ICU Level of Service	F	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	1146	3	0	0	449	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			4.0	
Lane Util. Factor	0.95	0.95			1.00	
Frt	1.00	1.00			1.00	
Flt Protected	0.95	0.95			0.95	
Satd. Flow (prot)	1573	1578			1719	
Flt Permitted	0.95	0.95			0.95	
Satd. Flow (perm)	1573	1578			1719	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	1398	4	0	0	548	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	699	703	0	0	548	0
Heavy Vehicles (%)	9%	0%	0%	0%	5%	0%
Turn Type	Perm	NA			Prot	
Protected Phases		8			2	
Permitted Phases	8					
Actuated Green, G (s)	35.1	35.1			24.4	
Effective Green, g (s)	35.1	35.1			24.4	
Actuated g/C Ratio	0.51	0.51			0.36	
Clearance Time (s)	5.0	5.0			4.0	
Vehicle Extension (s)	3.5	3.5			3.5	
Lane Grp Cap (vph)	806	808			612	
v/s Ratio Prot					c0.32	
v/s Ratio Perm	0.44	0.45				
v/c Ratio	0.87	0.87			0.90	
Uniform Delay, d1	14.7	14.7			20.8	
Progression Factor	1.00	1.00			1.00	
Incremental Delay, d2	12.1	12.3			15.9	
Delay (s)	26.8	27.0			36.7	
Level of Service	C	C			D	
Approach Delay (s)		26.9	0.0		36.7	
Approach LOS		C	A		D	

Intersection Summary			
HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	68.5	Sum of lost time (s)	9.0
Intersection Capacity Utilization	106.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	68	12	416	135	14	275
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	83	15	507	165	17	335
Pedestrians			4			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			3.5			
Percent Blockage			0			
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	963	590			672	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	963	590			672	
tC, single (s)	6.5	6.4			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.5			2.3	
p0 queue free %	70	97			98	
cM capacity (veh/h)	272	481			891	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	98	672	17	335
Volume Left	83	0	17	0
Volume Right	15	165	0	0
cSH	291	1700	891	1700
Volume to Capacity	0.33	0.40	0.02	0.20
Queue Length 95th (ft)	36	0	1	0
Control Delay (s)	23.5	0.0	9.1	0.0
Lane LOS	C		A	
Approach Delay (s)	23.5	0.0	0.4	
Approach LOS	C			

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	41.3%	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)	7	118	5	1	62	0	7	0	2	0	0	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	9	144	6	1	76	0	9	0	2	0	0	9
Pedestrians		1						4				
Lane Width (ft)		12.0						12.0				
Walking Speed (ft/s)		3.5						3.5				
Percent Blockage		0						0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	76			154			256	246	151	245	249	77
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			154			256	246	151	245	249	77
tC, single (s)	4.1			4.2			7.1	7.5	6.2	7.2	7.0	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.9	3.3	3.6	4.5	3.3
p0 queue free %	99			100			99	100	100	100	100	99
cM capacity (veh/h)	1536			1397			681	513	897	690	573	989

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	159	77	11	9
Volume Left	9	1	9	0
Volume Right	6	0	2	9
cSH	1536	1397	719	989
Volume to Capacity	0.01	0.00	0.02	0.01
Queue Length 95th (ft)	0	0	1	1
Control Delay (s)	0.4	0.1	10.1	8.7
Lane LOS	A	A	B	A
Approach Delay (s)	0.4	0.1	10.1	8.7
Approach LOS			B	A

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	23.9%	ICU Level of Service	A	
Analysis Period (min)	15			

1: SE 192nd Ave & SE Brady Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.2	0.0	0.1	0.3
Denied Del/Veh (s)	0.6	1.3	0.0	0.4	0.4
Total Delay (hr)	0.1	2.5	4.9	3.8	11.2
Total Del/Veh (s)	27.6	16.2	11.9	11.9	12.7
Vehicles Entered	16	549	1473	1128	3166

2: SE 192nd Ave & SR 14 WB Ramps Performance by approach

Approach	WB	NB	SB	All
Denied Delay (hr)	0.3	0.0	0.0	0.3
Denied Del/Veh (s)	3.3	0.0	0.0	0.4
Total Delay (hr)	2.1	0.4	2.2	4.7
Total Del/Veh (s)	23.0	1.1	5.5	5.7
Vehicles Entered	323	1176	1450	2949

3: SR 14 EB Ramps & SE 192nd Ave Performance by approach

Approach	EB	SB	All
Denied Delay (hr)	0.1	0.0	0.1
Denied Del/Veh (s)	0.3	0.2	0.3
Total Delay (hr)	5.6	2.7	8.3
Total Del/Veh (s)	17.3	21.7	18.5
Vehicles Entered	1151	450	1601

4: SE Brady Rd & NW McIntosh Rd Performance by approach

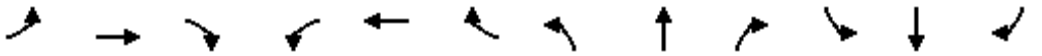
Approach	WB	NB	SB	All
Denied Delay (hr)	0.0	0.1	0.0	0.1
Denied Del/Veh (s)	0.0	0.3	0.4	0.3
Total Delay (hr)	0.5	0.7	0.1	1.3
Total Del/Veh (s)	22.9	2.8	0.8	3.7
Vehicles Entered	84	910	287	1281

5: Sacajawea St & NW McIntosh Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.1	0.1	0.1	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.6	0.1	3.9	2.8	0.6
Vehicles Entered	142	64	8	6	220

Appendix G

Year 2018 Total Traffic Operations Analysis Worksheets



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	9	11	574	10	40	11	683	263	24	759	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.88		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	940		1770	1400		992	3406	1455	1543	3505	1615
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	940		1770	1400		992	3406	1455	1543	3505	1615
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	1	10	13	660	11	46	13	785	302	28	872	2
RTOR Reduction (vph)	0	12	0	0	28	0	0	0	197	0	0	1
Lane Group Flow (vph)	1	11	0	660	29	0	13	785	105	28	872	1
Heavy Vehicles (%)	0%	89%	82%	2%	100%	0%	82%	6%	11%	17%	3%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)	0.7	2.9		26.7	28.9		1.0	21.1	21.1	2.0	22.1	22.1
Effective Green, g (s)	0.7	2.9		26.7	28.9		1.0	21.1	21.1	2.0	22.1	22.1
Actuated g/C Ratio	0.01	0.04		0.37	0.40		0.01	0.29	0.29	0.03	0.30	0.30
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	17	37		650	556		13	988	422	42	1065	490
v/s Ratio Prot	0.00	c0.01		c0.37	0.02		0.01	0.23		c0.02	c0.25	
v/s Ratio Perm									0.07			0.00
v/c Ratio	0.06	0.28		1.02	0.05		1.00	0.79	0.25	0.67	0.82	0.00
Uniform Delay, d1	35.7	33.9		23.0	13.5		35.9	23.8	19.7	35.0	23.4	17.6
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	1.5		39.2	0.0		249.6	4.2	0.1	26.8	4.7	0.0
Delay (s)	36.2	35.4		62.2	13.5		285.5	28.0	19.8	61.8	28.2	17.6
Level of Service	D	D		E	B		F	C	B	E	C	B
Approach Delay (s)		35.5			58.3			28.8			29.2	
Approach LOS		D			E			C			C	

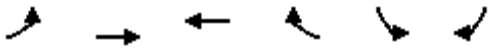
Intersection Summary			
HCM 2000 Control Delay	36.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	72.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	2	280	0	677	0	0	233	1111
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	0	0	2	315	0	761	0	0	262	1248
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								298			555	
pX, platoon unblocked	0.77	0.77	0.77	0.77	0.77		0.77					
vC, conflicting volume	643	1022	262	1022	1022	380	262			761		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	386	879	0	879	879	380	0			761		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	7.0	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	100	100	100	100	99	48	100			100		
cM capacity (veh/h)	203	222	839	188	222	606	1259			860		

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	317	0	380	380	678	832
Volume Left	0	0	0	0	0	0
Volume Right	315	0	0	0	416	832
cSH	611	1700	1700	1700	1700	1700
Volume to Capacity	0.52	0.00	0.22	0.22	0.40	0.49
Queue Length 95th (ft)	75	0	0	0	0	0
Control Delay (s)	17.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	17.2	0.0			0.0	
Approach LOS	C					

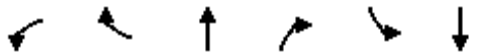
Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	79.3%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	677	0	0	0	233	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			4.0	
Lane Util. Factor	0.95	0.95			1.00	
Frt	1.00	1.00			1.00	
Flt Protected	0.95	0.95			0.95	
Satd. Flow (prot)	1573	1573			1719	
Flt Permitted	0.95	0.95			0.95	
Satd. Flow (perm)	1573	1573			1719	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	826	0	0	0	284	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	413	413	0	0	284	0
Heavy Vehicles (%)	9%	0%	0%	0%	5%	0%
Turn Type	Perm	NA			Prot	
Protected Phases		8			2	
Permitted Phases	8					
Actuated Green, G (s)	35.2	35.2			15.2	
Effective Green, g (s)	35.2	35.2			15.2	
Actuated g/C Ratio	0.59	0.59			0.26	
Clearance Time (s)	5.0	5.0			4.0	
Vehicle Extension (s)	3.5	3.5			3.5	
Lane Grp Cap (vph)	932	932			439	
v/s Ratio Prot					c0.17	
v/s Ratio Perm	c0.26	0.26				
v/c Ratio	0.44	0.44			0.65	
Uniform Delay, d1	6.7	6.7			19.7	
Progression Factor	1.00	1.00			1.00	
Incremental Delay, d2	1.5	1.5			3.4	
Delay (s)	8.2	8.2			23.1	
Level of Service	A	A			C	
Approach Delay (s)		8.2	0.0		23.1	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	154	13	203	45	8	377
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	188	16	248	55	10	460
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	754	275			302	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	754	275			302	
tC, single (s)	6.5	6.4			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.5			2.3	
p0 queue free %	49	98			99	
cM capacity (veh/h)	368	729			1225	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	204	302	10	460
Volume Left	188	0	10	0
Volume Right	16	55	0	0
cSH	383	1700	1225	1700
Volume to Capacity	0.53	0.18	0.01	0.27
Queue Length 95th (ft)	75	0	1	0
Control Delay (s)	24.6	0.0	8.0	0.0
Lane LOS	C		A	
Approach Delay (s)	24.6	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	35.8%	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 (veh/h)	1	34	12	1	108	0	40	0	0	0	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	1	41	15	1	132	0	49	0	0	0	0	7
Pedestrians					1			1			1	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	133			57			194	187	51	187	195	133
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	133			57			194	187	51	187	195	133
tC, single (s)	4.1			4.2			7.1	7.5	6.2	7.2	7.0	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.9	3.3	3.6	4.5	3.3
p0 queue free %	100			100			94	100	100	100	100	99
cM capacity (veh/h)	1463			1521			755	561	1021	757	621	921

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	57	133	49	7
Volume Left	1	1	49	0
Volume Right	15	0	0	7
cSH	1463	1521	755	921
Volume to Capacity	0.00	0.00	0.06	0.01
Queue Length 95th (ft)	0	0	5	1
Control Delay (s)	0.2	0.1	10.1	8.9
Lane LOS	A	A	B	A
Approach Delay (s)	0.2	0.1	10.1	8.9
Approach LOS			B	A

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	22.1%	ICU Level of Service	A
Analysis Period (min)	15		

1: SE 192nd Ave & SE Brady Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.3	0.0	0.1	0.4
Denied Del/Veh (s)	0.2	1.3	0.0	0.3	0.5
Total Delay (hr)	0.1	4.1	3.1	3.1	10.5
Total Del/Veh (s)	19.8	18.0	11.7	14.2	14.5
Vehicles Entered	22	805	966	785	2578

2: SE 192nd Ave & SR 14 WB Ramps Performance by approach

Approach	WB	NB	SB	All
Denied Delay (hr)	0.3	0.0	0.0	0.3
Denied Del/Veh (s)	3.3	0.0	0.0	0.4
Total Delay (hr)	0.7	0.1	1.6	2.4
Total Del/Veh (s)	8.7	0.6	4.2	3.7
Vehicles Entered	287	688	1358	2333

3: SR 14 EB Ramps & SE 192nd Ave Performance by approach

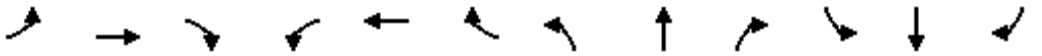
Approach	EB	SB	All
Denied Delay (hr)	0.0	0.0	0.0
Denied Del/Veh (s)	0.2	0.0	0.1
Total Delay (hr)	1.6	1.3	2.9
Total Del/Veh (s)	8.6	19.0	11.3
Vehicles Entered	671	241	912

4: SE Brady Rd & NW McIntosh Rd Performance by approach

Approach	WB	NB	SB	All
Denied Delay (hr)	0.0	0.0	0.0	0.1
Denied Del/Veh (s)	0.0	0.2	0.4	0.2
Total Delay (hr)	1.1	0.1	0.1	1.4
Total Del/Veh (s)	23.8	1.2	0.9	4.9
Vehicles Entered	171	455	387	1013

5: Sacajawea St & NW McIntosh Rd Performance by approach

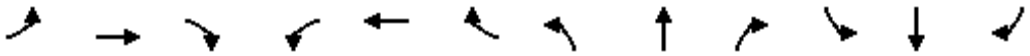
Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.1	0.1	0.1	0.1
Total Delay (hr)	0.0	0.0	0.1	0.0	0.1
Total Del/Veh (s)	0.3	0.2	4.3	2.5	1.1
Vehicles Entered	49	113	42	7	211



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	12	2	381	10	51	2	948	549	63	1074	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.98		1.00	0.87		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	991		1770	1434		992	3406	1455	1543	3505	1615
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	991		1770	1434		992	3406	1455	1543	3505	1615
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	2	14	2	438	11	59	2	1090	631	72	1234	3
RTOR Reduction (vph)	0	2	0	0	41	0	0	0	257	0	0	2
Lane Group Flow (vph)	2	14	0	438	29	0	2	1090	374	72	1234	1
Heavy Vehicles (%)	0%	89%	82%	2%	100%	0%	82%	6%	11%	17%	3%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)	0.8	3.1		24.6	26.9		0.8	33.7	33.7	6.2	39.1	39.1
Effective Green, g (s)	0.8	3.1		24.6	26.9		0.8	33.7	33.7	6.2	39.1	39.1
Actuated g/C Ratio	0.01	0.04		0.28	0.31		0.01	0.38	0.38	0.07	0.45	0.45
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	16	35		497	440		9	1310	559	109	1564	720
v/s Ratio Prot	0.00	c0.01		c0.25	0.02		0.00	0.32		c0.05	c0.35	
v/s Ratio Perm									0.26			0.00
v/c Ratio	0.12	0.40		0.88	0.07		0.22	0.83	0.67	0.66	0.79	0.00
Uniform Delay, d1	43.1	41.3		30.1	21.5		43.1	24.4	22.3	39.7	20.7	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	1.3	2.7		16.2	0.0		4.5	4.5	2.4	11.0	2.5	0.0
Delay (s)	44.3	44.1		46.3	21.5		47.6	28.9	24.7	50.7	23.2	13.4
Level of Service	D	D		D	C		D	C	C	D	C	B
Approach Delay (s)		44.1			42.9			27.3			24.7	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	87.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

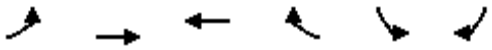
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	1	3	326	2	1173	0	0	452	1005
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	0	1	3	366	2	1318	0	0	508	1129
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								298			555	
pX, platoon unblocked	0.69	0.69	0.69	0.69	0.69		0.69					
vC, conflicting volume	1173	1830	508	1830	1830	659	508			1318		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1025	1980	57	1980	1980	659	57			1318		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	7.0	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	100	100	100	96	92	8	100			100		
cM capacity (veh/h)	10	43	690	26	43	397	1073			531		

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	371	2	659	659	884	753
Volume Left	1	2	0	0	0	0
Volume Right	366	0	0	0	376	753
cSH	402	1073	1700	1700	1700	1700
Volume to Capacity	0.92	0.00	0.39	0.39	0.52	0.44
Queue Length 95th (ft)	250	0	0	0	0	0
Control Delay (s)	61.1	8.4	0.0	0.0	0.0	0.0
Lane LOS	F	A				
Approach Delay (s)	61.1	0.0			0.0	
Approach LOS	F					

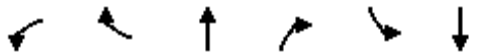
Intersection Summary				
Average Delay	6.8			
Intersection Capacity Utilization	94.4%	ICU Level of Service	F	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	1175	3	0	0	453	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			4.0	
Lane Util. Factor	0.95	0.95			1.00	
Frt	1.00	1.00			1.00	
Flt Protected	0.95	0.95			0.95	
Satd. Flow (prot)	1573	1578			1719	
Flt Permitted	0.95	0.95			0.95	
Satd. Flow (perm)	1573	1578			1719	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	1433	4	0	0	552	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	716	721	0	0	552	0
Heavy Vehicles (%)	9%	0%	0%	0%	5%	0%
Turn Type	Perm	NA			Prot	
Protected Phases		8			2	
Permitted Phases	8					
Actuated Green, G (s)	35.1	35.1			24.6	
Effective Green, g (s)	35.1	35.1			24.6	
Actuated g/C Ratio	0.51	0.51			0.36	
Clearance Time (s)	5.0	5.0			4.0	
Vehicle Extension (s)	3.5	3.5			3.5	
Lane Grp Cap (vph)	803	806			615	
v/s Ratio Prot					c0.32	
v/s Ratio Perm	0.46	0.46				
v/c Ratio	0.89	0.89			0.90	
Uniform Delay, d1	15.1	15.1			20.9	
Progression Factor	1.00	1.00			1.00	
Incremental Delay, d2	14.3	14.5			16.1	
Delay (s)	29.4	29.6			36.9	
Level of Service	C	C			D	
Approach Delay (s)		29.5	0.0		36.9	
Approach LOS		C	A		D	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	68.7	Sum of lost time (s)	9.0
Intersection Capacity Utilization	107.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	90	14	416	175	18	275
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	110	17	507	213	22	335
Pedestrians			4			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			3.5			
Percent Blockage			0			
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	997	614			721	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	997	614			721	
tC, single (s)	6.5	6.4			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.5			2.3	
p0 queue free %	57	96			97	
cM capacity (veh/h)	258	465			854	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	127	721	22	335
Volume Left	110	0	22	0
Volume Right	17	213	0	0
cSH	275	1700	854	1700
Volume to Capacity	0.46	0.42	0.03	0.20
Queue Length 95th (ft)	57	0	2	0
Control Delay (s)	28.9	0.0	9.3	0.0
Lane LOS	D		A	
Approach Delay (s)	28.9	0.0	0.6	
Approach LOS	D			

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	45.1%	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)	7	118	49	1	62	0	31	0	2	0	0	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	9	144	60	1	76	0	38	0	2	0	0	9
Pedestrians		1						4				
Lane Width (ft)		12.0						12.0				
Walking Speed (ft/s)		3.5						3.5				
Percent Blockage		0						0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	76			208			282	273	178	271	303	77
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			208			282	273	178	271	303	77
tC, single (s)	4.1			4.2			7.1	7.5	6.2	7.2	7.0	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.9	3.3	3.6	4.5	3.3
p0 queue free %	99			100			94	100	100	100	100	99
cM capacity (veh/h)	1536			1335			654	493	867	662	533	989

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	212	77	40	9
Volume Left	9	1	38	0
Volume Right	60	0	2	9
cSH	1536	1335	664	989
Volume to Capacity	0.01	0.00	0.06	0.01
Queue Length 95th (ft)	0	0	5	1
Control Delay (s)	0.3	0.1	10.8	8.7
Lane LOS	A	A	B	A
Approach Delay (s)	0.3	0.1	10.8	8.7
Approach LOS			B	A

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	28.5%	ICU Level of Service	A
Analysis Period (min)	15		

1: SE 192nd Ave & SE Brady Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.2	0.0	0.1	0.4
Denied Del/Veh (s)	0.5	1.3	0.0	0.5	0.4
Total Delay (hr)	0.2	2.9	5.1	4.1	12.2
Total Del/Veh (s)	33.8	17.7	12.1	13.0	13.6
Vehicles Entered	18	579	1499	1129	3225

2: SE 192nd Ave & SR 14 WB Ramps Performance by approach

Approach	WB	NB	SB	All
Denied Delay (hr)	0.3	0.0	0.0	0.3
Denied Del/Veh (s)	3.3	0.0	0.0	0.4
Total Delay (hr)	2.0	0.4	2.3	4.6
Total Del/Veh (s)	22.2	1.1	5.6	5.6
Vehicles Entered	316	1203	1461	2980

3: SR 14 EB Ramps & SE 192nd Ave Performance by approach

Approach	EB	SB	All
Denied Delay (hr)	0.1	0.1	0.2
Denied Del/Veh (s)	0.3	0.5	0.4
Total Delay (hr)	6.0	2.9	8.9
Total Del/Veh (s)	18.2	22.9	19.5
Vehicles Entered	1180	459	1639

4: SE Brady Rd & NW McIntosh Rd Performance by approach

Approach	WB	NB	SB	All
Denied Delay (hr)	0.0	0.1	0.0	0.1
Denied Del/Veh (s)	0.0	0.3	0.5	0.4
Total Delay (hr)	1.0	0.9	0.1	1.9
Total Del/Veh (s)	33.2	3.2	1.0	5.0
Vehicles Entered	102	962	292	1356

5: Sacajawea St & NW McIntosh Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.1	0.1	0.1	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	0.9	0.1	4.8	2.8	1.2
Vehicles Entered	200	58	34	8	300