



## CITY OF KIRKLAND

### Department of Public Works

123 Fifth Avenue, Kirkland, WA 98033 425.587.3800

[www.kirklandwa.gov](http://www.kirklandwa.gov)

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## MEMORANDUM

**To:** Planning Department

**From:** Thang Nguyen, Transportation Engineer

**Date:** May 20, 2015

**Subject:** MacDonald Estates Plat Traffic Concurrency Test Notice, Tran15-00820.

The purpose of this memo is to inform you that the proposed MacDonald Estates Plat residential development has passed traffic concurrency.

### Project Description

The applicant proposed to replace the one existing single-family house with 16 single-family houses. One driveway off 72<sup>nd</sup> Avenue NE will project access to the project site. The project is located at 12702 72nd Avenue NE. The proposed project is anticipated to be completely built and occupied by the end of 2017. The project is forecasted to generate 183 net new daily trips, 19 net new PM peak hour trips and 20 net new AM peak hour trips.

This memo will serve as the concurrency test notice for the proposed project. Per *Section 25.10.020 Procedures* of the KMC (Kirkland Municipal Code), this Concurrency Test Notice will expire in one year (May 20, 2016) unless a development permit and certificate of concurrency are issued or an extension is granted.

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The concurrency test notice shall expire and a new concurrency test application is required unless:

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**APPEALS**

The concurrency test notice may be appealed by the public or agency with jurisdiction. The concurrency test notice is subject to an appeal until the SEPA review process is complete and the appeal deadline has passed. Concurrency appeals are heard before the Hearing Examiner along with any applicable SEPA appeal. For more information, refer to the Kirkland Municipal Code, Title 25. If you have any questions, please call me at x3869.

cc: Vincent J. Geglia, TraffEx  
John Burkhalter, Senior Development Engineer



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cc: Vincent J. Geglia, TraffEx  
John Burkhalter, Senior Development Engineer

**MACDONALD ESTATES PLAT  
TRAFFIC IMPACT ANALYSIS**

**CITY OF KIRKLAND**

Prepared for

**Greg Nelson**

**William Buchan Homes  
2630 116<sup>th</sup> Ave NE, Suite 100  
Bellevue, WA 98004**

Prepared by



**11410 NE 124<sup>th</sup> St., #590  
Kirkland, Washington 98034  
Telephone: 425.522.4118**

**June 17, 2015**

June 17, 2015

Greg Nelson  
William Buchan Homes  
2630 116<sup>th</sup> Ave NE, Suite 100  
Bellevue, WA 98004

Re: MacDonald Estates Plat – City of Kirkland  
Traffic Impact Analysis

Dear Mr. Nelson:

We are pleased to submit this traffic impact analysis for the proposed 16 lot MacDonald Estates Plat located at 12704 72<sup>nd</sup> Ave. NE in the City of Kirkland. Preliminary trip generation and project information was submitted to the City in a letter report dated May 12, 2015. The project passed the traffic concurrency test per the May 20, 2015 memo attached in the technical appendix.

This TIA was prepared based on the City of Kirkland's current Traffic Impact Analysis Guidelines, the concurrency model trip distribution provided by the City and discussions with Thang Nguyen a Transportation Engineer on the City's staff.

### **PROJECT DESCRIPTION**

Figure 1 is a vicinity map showing the location of the site and the surrounding major street network. The proposed MacDonald Estates Plat is located at 12704 72<sup>nd</sup> Ave. NE in the City of Kirkland.

Figure 2 shows a preliminary site plan. The project consists of 16 single family homes. Proposed access is a new street to 72<sup>nd</sup> Ave. NE.

The 3.8 acre site is currently occupied by a single family home and associated outbuildings that will be removed with the development.

The anticipated build out and occupancy year of the MacDonald Estates Plat is 2017.

**TRIP GENERATION**

The removal of the existing single family home will result in a net increase of 15 single family homes with the development of this 16 lot plat. The MacDonald Estates plat is expected to generate the vehicular trips during an average weekday and during the street traffic peak hours as shown in the following table:

**TRIP GENERATION (NET 15 SF HOMES) MACDONALD ESTATES PLAT**

<i>Time Period</i>	<i>Trip equation</i>	<i>Trips Entering</i>	<i>Trips Exiting</i>	<i>Net New Trips Total</i>
Average Weekday	$\ln(t)=0.92\ln(x)+2.72$	91 50%	92 50%	183
AM Peak Hour	$t=0.7x+9.74$	5 25%	15 75%	20
PM Peak Hour	$\ln(t)=0.90\ln(x)+0.51$	12 63%	7 37%	19

t= number of trips x=number of units

A vehicle trip is defined as a single or one direction vehicle movement with either the origin or destination (exiting or entering) inside the study site.

The trip generation is calculated using the regression equations in the Institute of Transportation Engineers (ITE) Trip Generation – 9th Edition, for Single Family Detached Housing (ITE Land Use Code 210). These trip generation values account for all site trips made by all vehicles for all purposes, including resident, visitor, and service and delivery vehicle trips.

**TRIP DISTRIBUTION AND ASSIGNMENT**

Figure 3 shows the PM peak hour site generated traffic volumes and distribution at the site access/72<sup>nd</sup> St. NE and NE 138<sup>th</sup> Pl./Juanita Dr. NE intersections. The trip distribution is based on the concurrency model output provided by the City of Kirkland. The City requested LOS calculations for these two intersections.

**EXISTING PHYSICAL CONDITIONS**

The existing home and associated structures on the project site will be removed with development.

### Street Facilities

The primary roads in the study area are classified per the City of Kirkland, are as follows:

72 <sup>nd</sup> Ave NE	Local Street
NE 138 <sup>th</sup> Pl.	Local Street
Juanita Dr. NE	Minor Arterial

72<sup>nd</sup> Ave NE and NE 138<sup>th</sup> Pl. have a posted speed limit of 25 mph and generally consists of two lanes with a pavement width of 22 ft. with no curb, gutter or sidewalk. There is a marked trail crossing where 72<sup>nd</sup> Ave. NE turns east and becomes NE 138<sup>th</sup> Place. 72<sup>nd</sup> Ave NE dead ends south of the project site where it intersects NE 126<sup>th</sup> Street.

Juanita Dr. NE at the intersection of NE 138<sup>th</sup> Pl. has a posted speed limit of 35 mph, is 34 ft wide including a southbound lane, a northbound lane and a northbound left turn lane with 8 ft. paved shoulders. The north and south approaches to the intersection are marked with 30 mph advisory speed signs.

### Sight Distance

72<sup>nd</sup> Ave NE at the site access is essentially straight and flat. The sight distance meets current City of Kirkland's recommended sight distance requirement of 280 feet looking in both the north and south directions from the side street. The sight distance requirement is for a posted speed limit of 25 mph with stop sign controlled side streets.

The intersection of NE 138<sup>th</sup> Pl. at Juanita Dr. is on the outside of a horizontal curve. The sight distance meets current City of Kirkland's recommended sight distance requirement of 390 feet looking in both the north and south directions from the side street. The sight distance requirement is for a posted speed limit of 35 mph with stop sign controlled side streets

### Accident History

WSDOT and City crash data records show five accidents were reported on or in the vicinity of 72<sup>nd</sup> Ave NE, NE 138<sup>th</sup> Pl., and Juanita Dr NE during the four year period from 1/12011 through 12/31/2014. Two accidents were due to driving under the influence, two were due to the driver apparently asleep and one was due to the driver not granting right of way. The crash data is attached in the technical appendix.

We have field reviewed the site and surrounding street system. Based on our field observations, the lack of accident activity and the excellent sight distance, we conclude there are no readily apparent safety issues.

**EXISTING TRAFFIC CONDITIONS**

Traffic Volumes

AM and PM peak hour turning movement counts was performed at the NE 138 Pl./Juanita Dr. NE intersection on June 3 and 4, 2015. The volumes on 72<sup>nd</sup> Ave. NE at the site access were calculated using ITE rates for single family homes based on the eleven homes with access to 72<sup>nd</sup> Ave. NE located south of the project site. The traffic volume turning movement count sheets are included in the technical appendix. Figures 3 and 4 respectfully show the existing AM and PM peak hour traffic volumes at the study intersections.

Level of Service Analysis

LOS is a qualitative measure describing operational conditions within a traffic flow, and the perception of these conditions by drivers or passengers. These conditions include factors such as speed, delay, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. Levels of service are given letter designations, from A to F, with LOS A representing the best operating conditions (free flow, little delay) and LOS F the worst (congestion, long delays). Generally, LOS A and B are high, LOS C and D are moderate and LOS E and F are low.

Table 1 shows calculated levels of service (LOS) for existing conditions at the study intersection. The LOS's were calculated using the procedures in the Transportation Research Board Highway Capacity Manual. The LOS shown indicates overall intersection operation. At intersections, LOS is determined by the calculated average control delay per vehicle. The LOS and corresponding average control delay in seconds are as follows:

TYPE OF INTERSECTION	A	B	C	D	E	F
Signalized	≤ 10.0	>10.0 and ≤20.0	>20.0 and ≤35.0	>35.0 and ≤55.0	>55.0 and ≤80.0	>80.0
Stop Sign Control	≤10.0	>10 and ≤15	>15 and ≤25	>25 and ≤35	>35 and ≤50	>50

**FUTURE TRAFFIC CONDITIONS WITHOUT THE PROJECT**

Figures 3 and 4 show projected future AM and PM peak hour traffic volumes without the project. These volumes include the existing traffic volumes plus background traffic growth.

The City of Kirkland requires a 2.0% per year annual background growth factor be applied to existing traffic volumes to estimate future traffic volumes. The background

growth rate factor includes traffic volumes generated from other approved but unbuilt developments (pipeline projects), other planned developments, and general growth in traffic traveling through the area.

These 2015 volumes were increased by 2% per year (for a total of 4%) to estimate 2017 horizon year traffic volumes without the MacDonald Estates project.

### ***FUTURE TRAFFIC CONDITIONS WITH PROJECT***

Figures 3 and 4 show the projected PM peak hour traffic volumes with the proposed project. The site-generated peak hour traffic volumes were added to the projected future traffic volumes without project.

The study intersections are calculated to operate at acceptable levels of service in the AM and PM peak hours for future conditions including project generated traffic as shown in Tables 1 and 2.

### ***TRAFFIC MITIGATION***

The City of Kirkland requires a transportation impact mitigation fee of \$3,942 per each detached single family residential unit. One existing residential unit will be removed with this development, therefore the net new number of residential units is 15 units. The current road impact fee is therefore estimated to be 15 units X \$3,942 = \$59,130.

Full width street improvements are required on all internal plat streets and half street improvements to 72<sup>nd</sup> Ave. NE frontage to City of Kirkland Standards including curb, gutter and sidewalk.

**SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

We recommend that the MacDonald Estates plat be constructed as shown on the site plan with the following traffic impact mitigation measures:

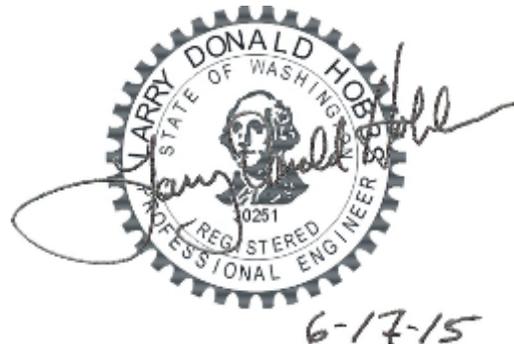
- Construct the full width street improvements on all internal plat streets and half street improvements to the 72<sup>nd</sup> Ave NE frontage to City of Kirkland Standards including curb, gutter and sidewalk.
- Contribute the transportation mitigation impact fee to the City of Kirkland estimated to be \$59,130 using the current fee for a single family unit.

No other traffic mitigation should be necessary. If you have any questions, please call 425-522-4118. You may also contact us via e-mail at [vince@nwtraffex.com](mailto:vince@nwtraffex.com) or [larry@nwtraffex.com](mailto:larry@nwtraffex.com).

Very truly yours,



Vincent J. Geglia  
Principal  
TraffEx



Larry D. Hobbs, P.E.  
Principal  
TraffEx

<b>TABLE 1</b>			
<b>AM PEAK HOUR LEVEL OF SERVICE SUMMARY</b>			
<b><i>INTERSECTION</i></b>	<b><i>EXISTING</i></b>	<b><i>2017 WITHOUT PROJECT</i></b>	<b><i>2017 WITH PROJECT</i></b>
Site Access/72 <sup>nd</sup> Ave. NE	NA	NA	A 8.4 WB
NE 138 <sup>th</sup> Pl./Juanita Dr NE	C 19.1 EB	C 20.2 EB	C 21.5 EB

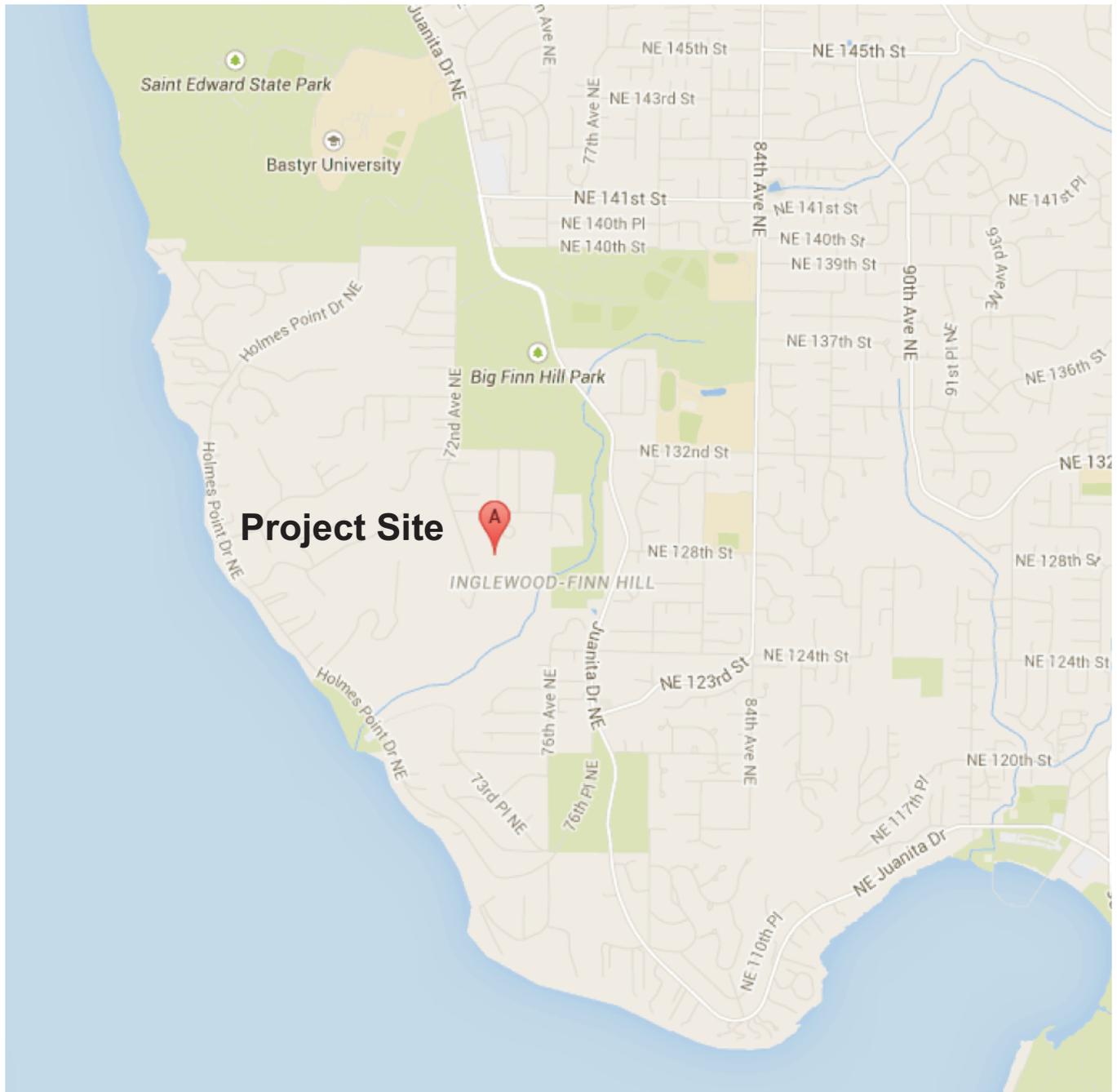
<b>TABLE 2</b>			
<b>PM PEAK HOUR LEVEL OF SERVICE SUMMARY</b>			
<b><i>INTERSECTION</i></b>	<b><i>EXISTING</i></b>	<b><i>2017 WITHOUT PROJECT</i></b>	<b><i>2017 WITH PROJECT</i></b>
Site Access/72 <sup>nd</sup> Ave. NE	NA	NA	A 8.3 WB
NE 138 <sup>th</sup> Pl./Juanita Dr NE	D 25.5 EB	D 27.8 EB	D 29.9 EB

XX Number shown is the average control delay in seconds per vehicle for the minor approach for unsignalized intersections, which determines the LOS for intersections per the Transportation Research Board Highway Capacity Manual

A Indicates calculated level of service

EB (eastbound) Indicates direction of the minor approach for the unsignalized intersection

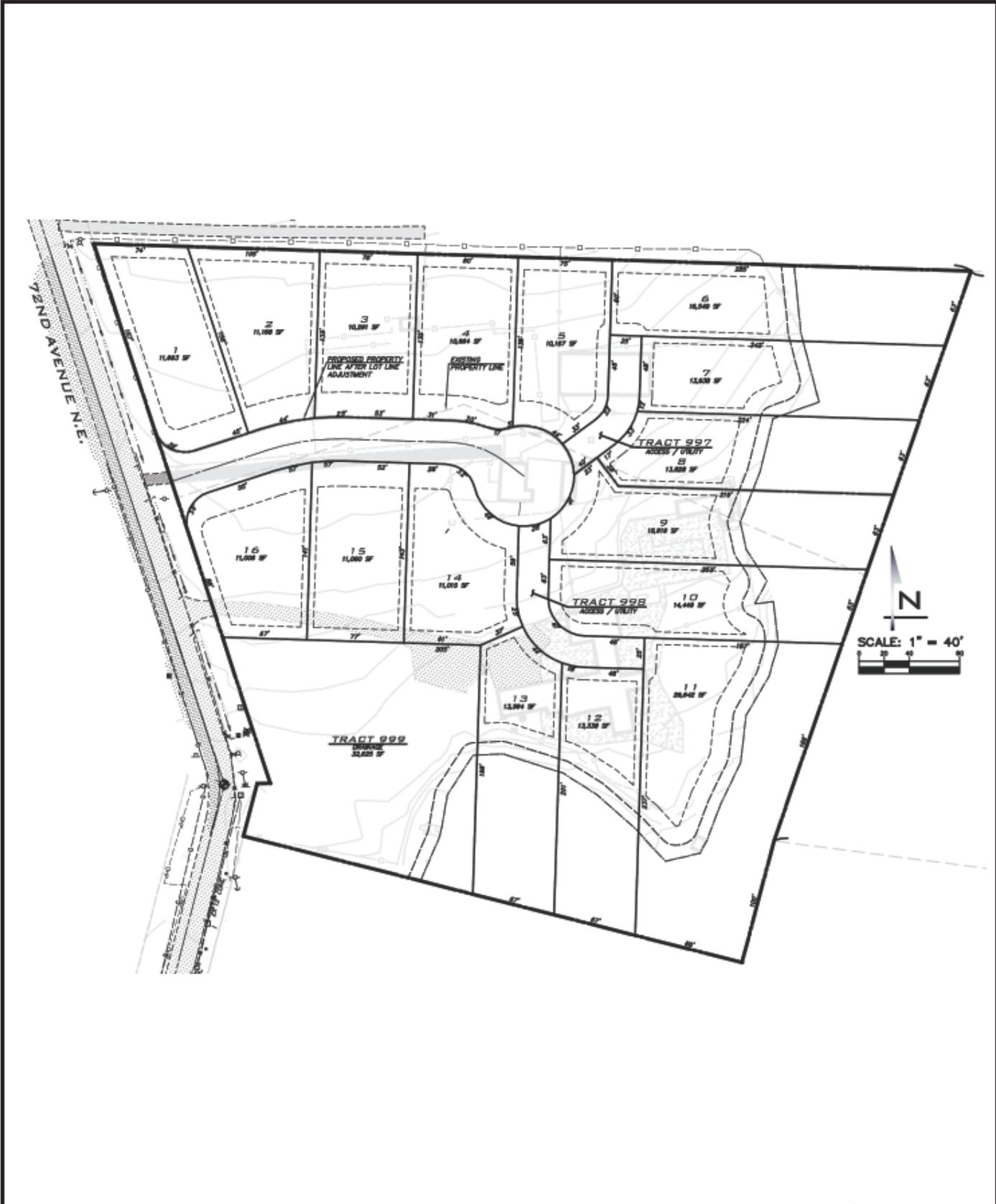
WB (westbound) Indicates direction of the minor approach for the unsignalized intersection



**MacDonal Estates Plat**

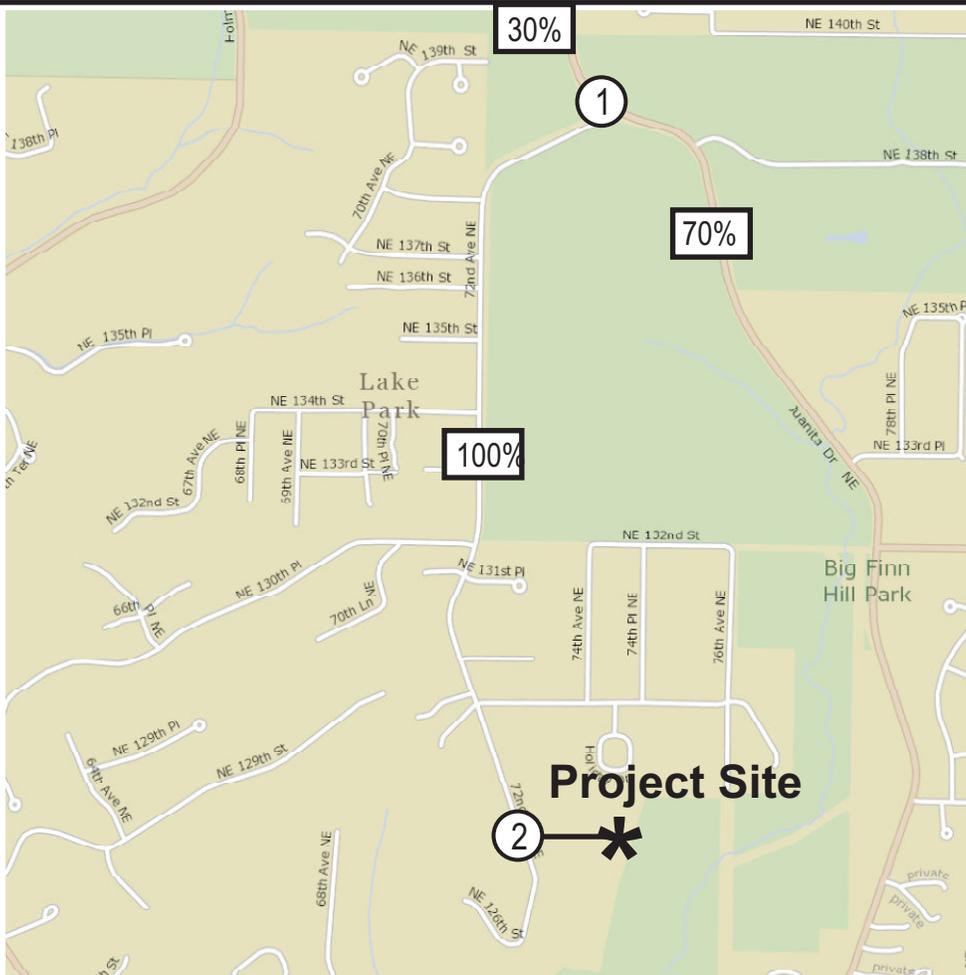
**Vicinity Map**

**Figure  
1**



MacDonal Estates Plat  
Site Plan

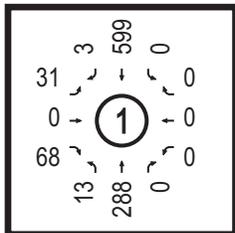
Figure  
2



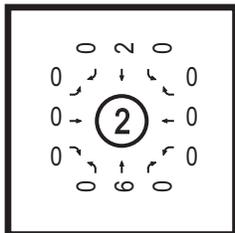
AM Peak Hour  
Project Volumes

- 5 Enter
- 15 Exit
- 20 Total

**Existing  
Traffic Volumes**

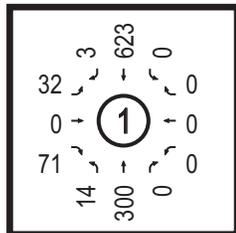


NE138th Pl/ Juanita Dr

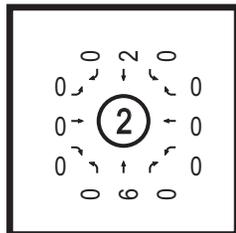


Site Access / 72nd Ave

**Future Without  
Project  
Traffic Volumes**

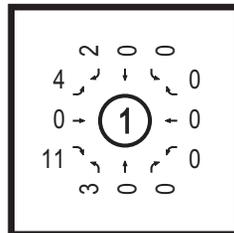


NE138th Pl/ Juanita Dr

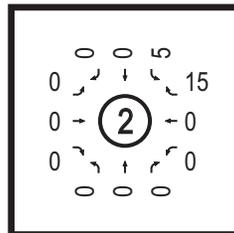


Site Access / 72nd Ave

**Project  
Generated  
Traffic Volumes**

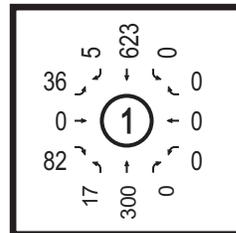


NE138th Pl/ Juanita Dr

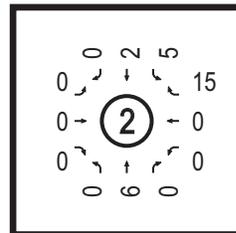


Site Access / 72nd Ave

**Future With  
Project  
Traffic Volumes**



NE138th Pl/ Juanita Dr

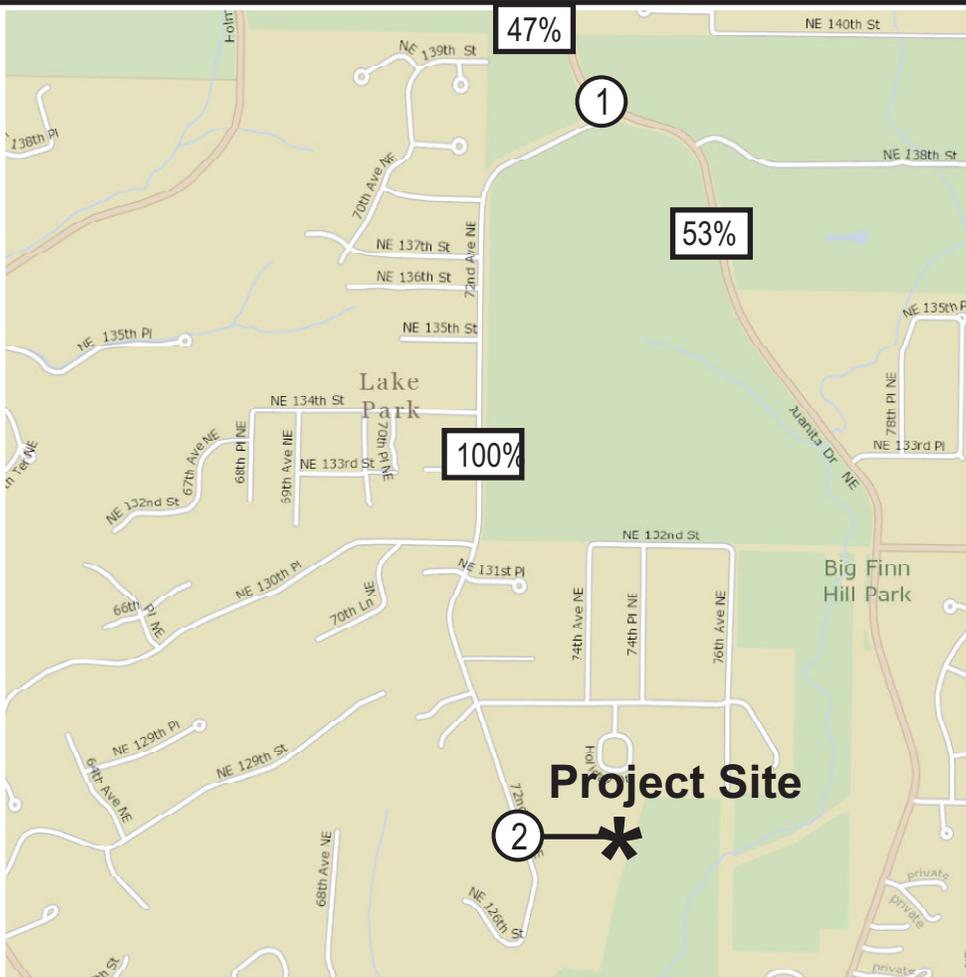


Site Access / 72nd Ave

**MacDonald Estates Plat**

**AM Peak Hour Traffic Volumes and Trip Distribution.**

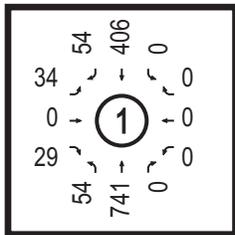
**Figure  
3**



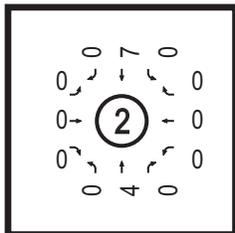
PM Peak Hour  
Project Volumes

12 Enter  
7 Exit  
19 Total

**Existing  
Traffic Volumes**

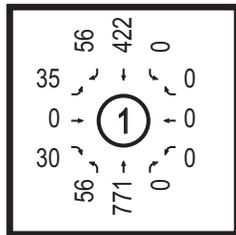


NE 138th Pl / Juanita Dr

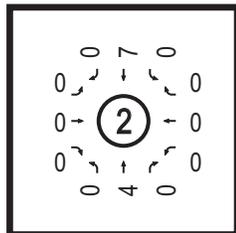


Site Access / 72nd Ave

**Future Without  
Project  
Traffic Volumes**

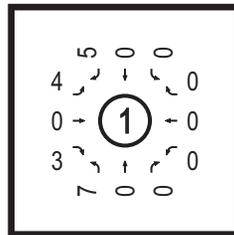


NE 138th Pl / Juanita Dr

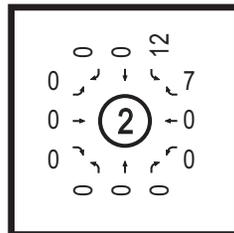


Site Access / 72nd Ave

**Project  
Generated  
Traffic Volumes**

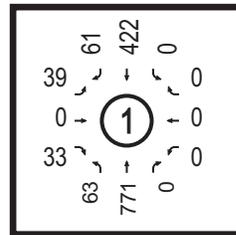


NE 138th Pl / Juanita Dr

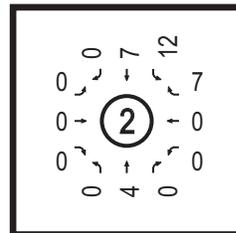


Site Access / 72nd Ave

**Future With  
Project  
Traffic Volumes**



NE 138th Pl / Juanita Dr



Site Access / 72nd Ave

**MacDonald Estates Plat**

**PM Peak Hour Traffic Volumes and Trip Distribution.**

**Figure  
4**

## **TECHNICAL APPENDIX**



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### **APPEALS**

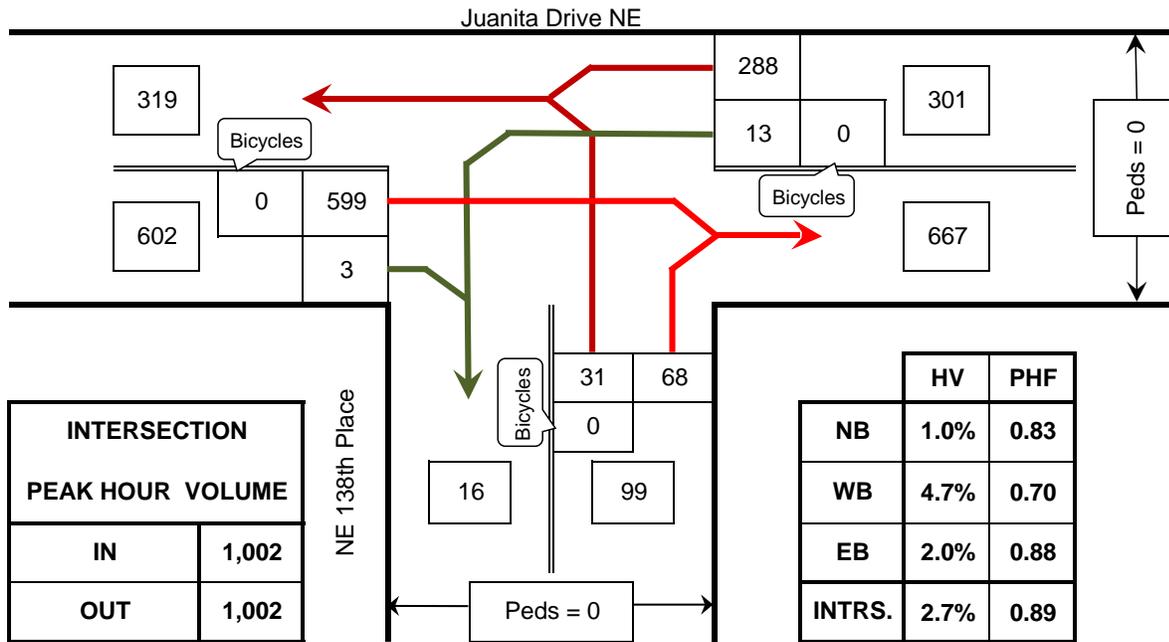
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cc: Vincent J. Geglia, TraffEx  
John Burkhalter, Senior Development Engineer



**TURNING MOVEMENTS DIAGRAM**

7:00 AM - 9:00 AM PEAK HOUR: 7:15 AM TO 8:15 AM



HV = Heavy Vehicles  
PHF = Peak Hour Factor

**Juanita Drive NE @ NE 138th Place**

**Kirkland, WA**

COUNTED BY: SW

DATE OF COUNT: Thu. 6/4/15

REDUCED BY: CN

TIME OF COUNT: 7:00 AM - 9:00 AM

REDUCTION DATE: Thu. 6/4/15

WEATHER: Sunny

# **TRAFFIC DATA GATHERING**

## INTERSECTION TURNING MOVEMENTS REDUCTION SHEET

LOCATION: Juanita Drive NE @ NE 138th Place  
Kirkland, WA

DATE OF COUNT: Thu. 6/4/15  
 TIME OF COUNT: 7:00 AM - 9:00 AM

COUNTED BY: SW  
 WEATHER: Sunny

TIME INTERVAL ENDING AT	FROM NORTH ON						FROM SOUTH ON NE 138th Place						FROM EAST ON Juanita Drive NE						FROM WEST ON Juanita Drive NE						INTERVAL TOTALS	
	Peds	HV	Bicycle	Left	Thru	Right	Peds	HV	Bicycle	Left	Thru	Right	Peds	HV	Bicycle	Left	Thru	Right	Peds	HV	Bicycle	Left	Thru	Right		
05:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
05:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	1	0	9	0	15	0	0	0	3	46	0	0	1	0	0	171	1	245	
07:30 AM	0	0	0	0	0	0	0	0	0	6	0	21	0	3	0	1	50	0	0	1	0	0	170	1	249	
07:45 AM	0	0	0	0	0	0	0	0	0	8	0	12	0	1	0	1	59	0	0	5	0	0	151	1	232	
08:00 AM	0	0	0	0	0	0	0	1	0	10	0	20	0	3	0	6	77	0	0	3	0	0	127	1	241	
08:15 AM	0	0	0	0	0	0	0	0	0	7	0	15	0	7	0	5	102	0	0	3	0	0	151	0	280	
08:30 AM	0	0	0	0	0	0	0	0	0	14	0	18	0	5	0	5	75	0	0	3	0	0	98	6	216	
08:45 AM	0	0	0	0	0	0	0	1	0	6	0	22	0	7	0	3	67	0	0	3	0	0	119	3	220	
09:00 AM	0	0	0	0	0	0	0	0	0	3	0	22	0	4	0	9	80	0	0	2	0	0	134	4	252	
<b>PEAK HOUR TOTALS</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>31</b>	<b>0</b>	<b>68</b>	<b>0</b>	<b>14</b>	<b>0</b>	<b>13</b>	<b>288</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>599</b>	<b>3</b>	<b>INTERSECTION</b>	
<b>ALL MOVEMENTS</b>	<b>0</b>						<b>99</b>						<b>301</b>						<b>602</b>						<b>1002</b>	
<b>% HV</b>	<b>#N/A</b>						<b>1.0%</b>						<b>4.7%</b>						<b>2.0%</b>						<b>2.7%</b>	
<b>PEAK HOUR FACTOR</b>	<b>#N/A</b>						<b>0.83</b>						<b>0.70</b>						<b>0.88</b>						<b>0.89</b>	

PHF = Peak Hour Factor

7:00 AM - 9:00 AM PEAK HOUR: 7:15 AM TO 8:15 AM

REDUCED BY: CN

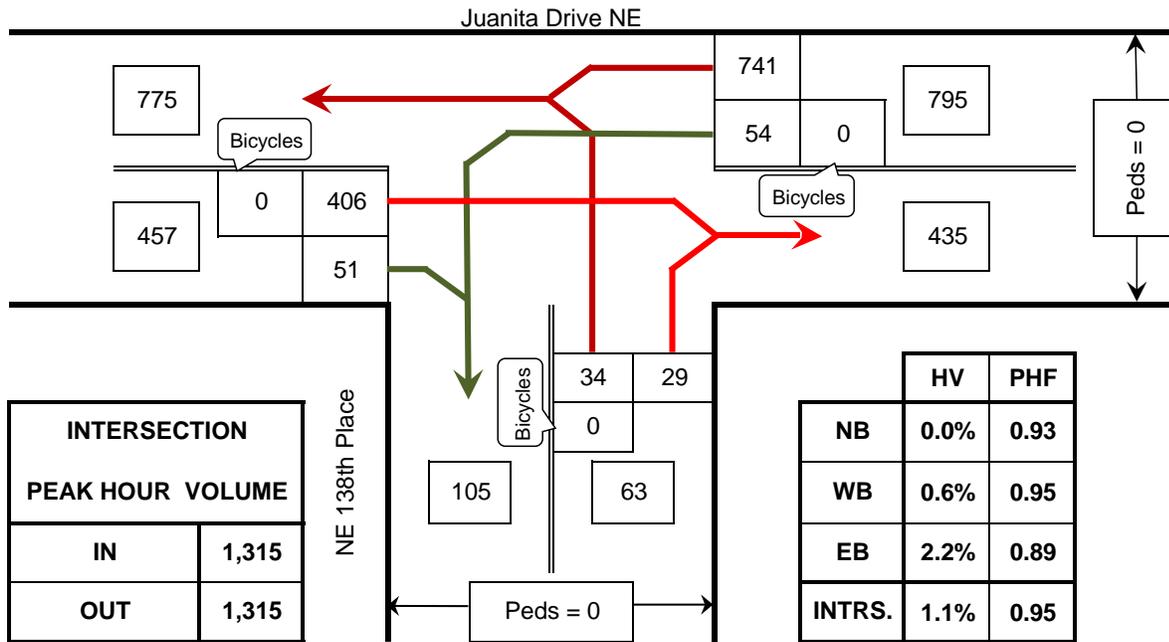
DATE OF REDUCTION: 6/4/2015

### ROLLING HOUR COUNT

TIME INTERVAL	FROM NORTH ON						FROM SOUTH ON NE 138th Place						FROM EAST ON Juanita Drive NE						FROM WEST ON Juanita Drive NE						INTERVAL TOTALS	
	Peds	HV	Bicycle	Left	Thru	Right	Peds	HV	Bicycle	Left	Thru	Right	Peds	HV	Bicycle	Left	Thru	Right	Peds	HV	Bicycle	Left	Thru	Right		
5:00 AM - 6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 AM - 6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 AM - 6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 AM - 6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM - 7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM - 8:00 AM	0	0	0	0	0	0	0	2	0	33	0	68	0	7	0	11	232	0	0	10	0	0	619	4	967	
7:15 AM - 8:15 AM	0	0	0	0	0	0	0	1	0	31	0	68	0	14	0	13	288	0	0	12	0	0	599	3	1002	
7:30 AM - 8:30 AM	0	0	0	0	0	0	0	1	0	39	0	65	0	16	0	17	313	0	0	14	0	0	527	8	969	
7:45 AM - 8:45 AM	0	0	0	0	0	0	0	2	0	37	0	75	0	22	0	19	321	0	0	12	0	0	495	10	957	
8:00 AM - 9:00 AM	0	0	0	0	0	0	0	1	0	30	0	77	0	23	0	22	324	0	0	11	0	0	502	13	968	

**TURNING MOVEMENTS DIAGRAM**

4:00 PM - 6:00 PM PEAK HOUR: 4:45 PM TO 5:45 PM



HV = Heavy Vehicles  
PHF = Peak Hour Factor

**Juanita Drive NE @ NE 138th Place**

**Kirkland, WA**

COUNTED BY: SW

DATE OF COUNT: Wed. 6/3/15

REDUCED BY: CN

TIME OF COUNT: 4:00 PM - 6:00 PM

REDUCTION DATE: Thu. 6/4/15

WEATHER: Overcast

# **TRAFFIC DATA GATHERING**

## INTERSECTION TURNING MOVEMENTS REDUCTION SHEET

LOCATION: Juanita Drive NE @ NE 138th Place  
Kirkland, WA

DATE OF COUNT: Wed. 6/3/15  
 TIME OF COUNT: 4:00 PM - 6:00 PM

COUNTED BY: SW  
 WEATHER: Overcast

TIME INTERVAL ENDING AT	FROM NORTH ON						FROM SOUTH ON NE 138th Place						FROM EAST ON Juanita Drive NE						FROM WEST ON Juanita Drive NE						INTERVAL TOTALS	
	Peds	HV	Bicycle	Left	Thru	Right	Peds	HV	Bicycle	Left	Thru	Right	Peds	HV	Bicycle	Left	Thru	Right	Peds	HV	Bicycle	Left	Thru	Right		
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	5	0	12	0	5	0	16	157	0	0	2	0	0	105	8	303	
04:30 PM	0	0	0	0	0	0	0	0	0	10	0	14	0	3	0	9	175	0	0	2	0	0	97	16	321	
04:45 PM	0	0	0	0	0	0	0	0	0	6	0	6	0	2	0	9	175	0	0	3	0	0	97	9	302	
05:00 PM	0	0	0	0	0	0	0	0	0	10	0	7	0	1	0	10	182	0	0	5	0	0	103	9	321	
05:15 PM	0	0	0	0	0	0	0	0	0	8	0	8	0	3	0	13	190	0	0	0	0	0	112	16	347	
05:30 PM	0	0	0	0	0	0	0	0	0	10	0	5	0	0	0	9	182	0	0	3	0	0	99	13	318	
05:45 PM	0	0	0	0	0	0	0	0	0	6	0	9	0	1	0	22	187	0	0	2	0	0	92	13	329	
06:00 PM	0	0	0	0	0	0	0	0	0	7	0	6	0	1	0	17	165	0	0	2	0	0	88	12	295	
<b>PEAK HOUR TOTALS</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>34</b>	<b>0</b>	<b>29</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>54</b>	<b>741</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>406</b>	<b>51</b>	<b>INTERSECTION</b>	
<b>ALL MOVEMENTS</b>	<b>0</b>						<b>63</b>						<b>795</b>						<b>457</b>						<b>1315</b>	
<b>% HV</b>	<b>#N/A</b>						<b>0.0%</b>						<b>0.6%</b>						<b>2.2%</b>						<b>1.1%</b>	
<b>PEAK HOUR FACTOR</b>	<b>#N/A</b>						<b>0.93</b>						<b>0.95</b>						<b>0.89</b>						<b>0.95</b>	

PHF = Peak Hour Factor

4:00 PM - 6:00 PM PEAK HOUR: 4:45 PM TO 5:45 PM

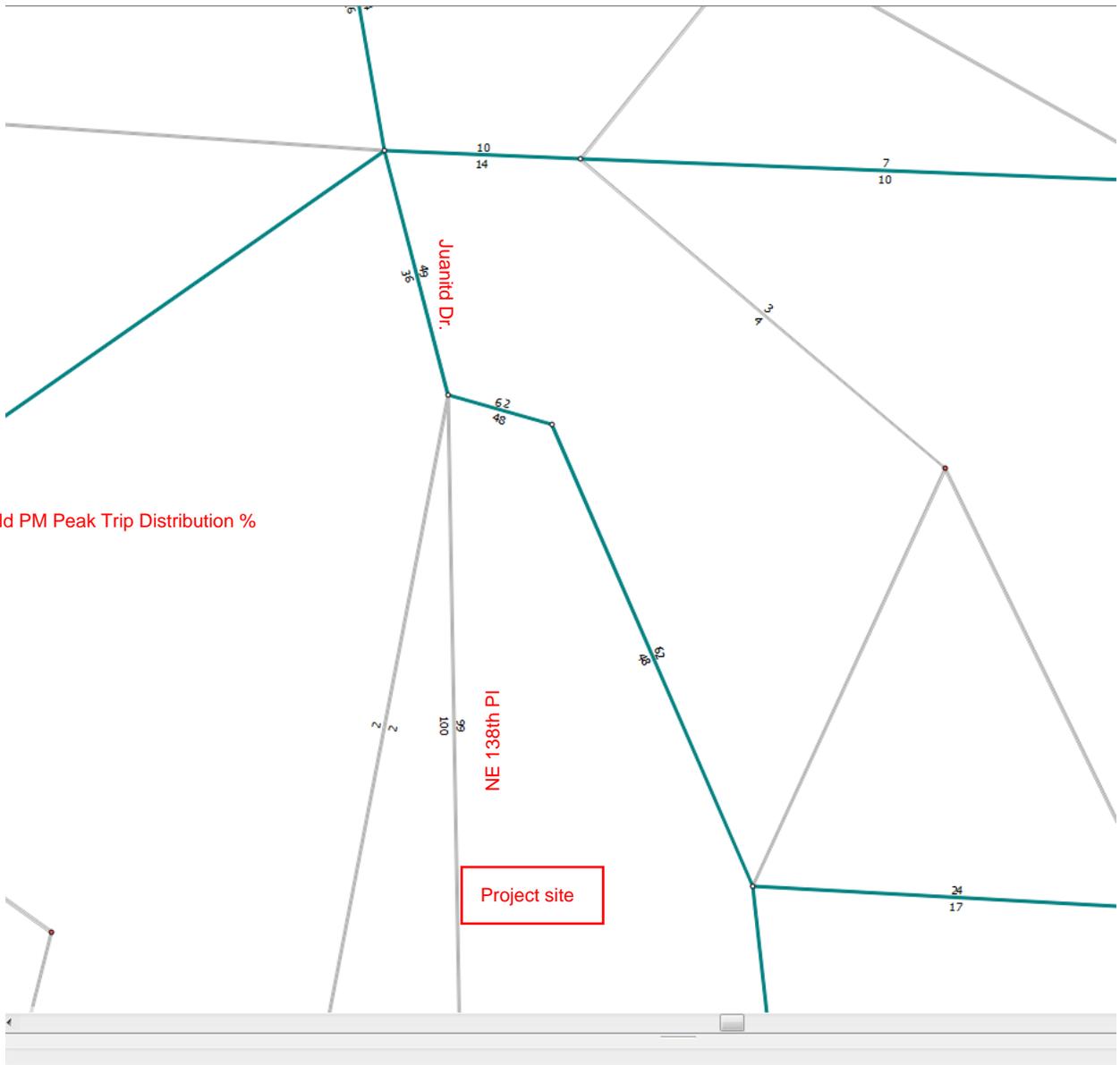
REDUCED BY: CN

DATE OF REDUCTION: 6/4/2015

### ROLLING HOUR COUNT

TIME INTERVAL	FROM NORTH ON						FROM SOUTH ON NE 138th Place						FROM EAST ON Juanita Drive NE						FROM WEST ON Juanita Drive NE						INTERVAL TOTALS	
	Peds	HV	Bicycle	Left	Thru	Right	Peds	HV	Bicycle	Left	Thru	Right	Peds	HV	Bicycle	Left	Thru	Right	Peds	HV	Bicycle	Left	Thru	Right		
2:00 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM - 3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM - 3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM - 3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM - 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	31	0	39	0	11	0	44	689	0	0	12	0	0	402	42	1247	
4:15 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	34	0	35	0	9	0	41	722	0	0	10	0	0	409	50	1291	
4:30 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	34	0	26	0	6	0	41	729	0	0	11	0	0	411	47	1288	
4:45 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	34	0	29	0	5	0	54	741	0	0	10	0	0	406	51	1315	
5:00 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	31	0	28	0	5	0	61	724	0	0	7	0	0	391	54	1289	

MacDonald PM Peak Trip Distribution %



**Intersection**

Int Delay, s/veh 2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	31	68	13	288	599	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	1	1	0	5	2	0
Mvmt Flow	35	76	15	324	673	3

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1028	675	676 0
Stage 1	675	-	- -
Stage 2	353	-	- -
Critical Hdwy	6.41	6.21	4.1 -
Critical Hdwy Stg 1	5.41	-	- -
Critical Hdwy Stg 2	5.41	-	- -
Follow-up Hdwy	3.509	3.309	2.2 -
Pot Cap-1 Maneuver	260	456	925 -
Stage 1	508	-	- -
Stage 2	713	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	256	456	925 -
Mov Cap-2 Maneuver	256	-	- -
Stage 1	508	-	- -
Stage 2	701	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	19.1	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	925	-	366	-	-
HCM Lane V/C Ratio	0.016	-	0.304	-	-
HCM Control Delay (s)	9	-	19.1	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	1.3	-	-

AM FUTURE WITHOUT PROJECT  
3: JUANITA DR & NE 138TH PL

6/14/2015

**Intersection**

Int Delay, s/veh 2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	32	71	14	300	623	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	1	1	0	5	2	0
Mvmt Flow	36	80	16	337	700	3

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1071	702	703 0
Stage 1	702	-	- -
Stage 2	369	-	- -
Critical Hdwy	6.41	6.21	4.1 -
Critical Hdwy Stg 1	5.41	-	- -
Critical Hdwy Stg 2	5.41	-	- -
Follow-up Hdwy	3.509	3.309	2.2 -
Pot Cap-1 Maneuver	246	440	904 -
Stage 1	493	-	- -
Stage 2	702	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	242	440	904 -
Mov Cap-2 Maneuver	242	-	- -
Stage 1	493	-	- -
Stage 2	690	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	20.2	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	904	-	351	-	-
HCM Lane V/C Ratio	0.017	-	0.33	-	-
HCM Control Delay (s)	9.1	-	20.2	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.4	-	-

AM FUTURE WITH PROJECT  
3: JUANITA DR & NE 138TH PL

6/14/2015

**Intersection**

Int Delay, s/veh 2.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	36	82	17	300	623	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	1	1	0	5	2	0
Mvmt Flow	40	92	19	337	700	6

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1078	703	706 0
Stage 1	703	-	- -
Stage 2	375	-	- -
Critical Hdwy	6.41	6.21	4.1 -
Critical Hdwy Stg 1	5.41	-	- -
Critical Hdwy Stg 2	5.41	-	- -
Follow-up Hdwy	3.509	3.309	2.2 -
Pot Cap-1 Maneuver	243	439	902 -
Stage 1	493	-	- -
Stage 2	697	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	238	439	902 -
Mov Cap-2 Maneuver	238	-	- -
Stage 1	493	-	- -
Stage 2	682	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	21.5	0.5	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	902	-	349	-	-
HCM Lane V/C Ratio	0.021	-	0.38	-	-
HCM Control Delay (s)	9.1	-	21.5	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.7	-	-

**Intersection**

Int Delay, s/veh 1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	34	29	54	741	406	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	1	2	0
Mvmt Flow	36	31	57	780	427	54

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1348	454	481 0
Stage 1	454	-	- -
Stage 2	894	-	- -
Critical Hdwy	6.4	6.2	4.1 -
Critical Hdwy Stg 1	5.4	-	- -
Critical Hdwy Stg 2	5.4	-	- -
Follow-up Hdwy	3.5	3.3	2.2 -
Pot Cap-1 Maneuver	168	610	1092 -
Stage 1	644	-	- -
Stage 2	403	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	159	610	1092 -
Mov Cap-2 Maneuver	159	-	- -
Stage 1	644	-	- -
Stage 2	382	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	25.5	0.6	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1092	-	241	-	-
HCM Lane V/C Ratio	0.052	-	0.275	-	-
HCM Control Delay (s)	8.5	-	25.5	-	-
HCM Lane LOS	A	-	D	-	-
HCM 95th %tile Q(veh)	0.2	-	1.1	-	-

PM FUTURE WITHOUT PROJECT  
3: JUANITA DR & NE 138TH PL

6/14/2015

**Intersection**

Int Delay, s/veh 1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	35	30	56	771	422	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	1	2	0
Mvmt Flow	37	32	59	812	444	59

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1403	474	503 0
Stage 1	474	-	- -
Stage 2	929	-	- -
Critical Hdwy	6.4	6.2	4.1 -
Critical Hdwy Stg 1	5.4	-	- -
Critical Hdwy Stg 2	5.4	-	- -
Follow-up Hdwy	3.5	3.3	2.2 -
Pot Cap-1 Maneuver	156	595	1072 -
Stage 1	630	-	- -
Stage 2	388	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	147	595	1072 -
Mov Cap-2 Maneuver	147	-	- -
Stage 1	630	-	- -
Stage 2	367	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	27.8	0.6	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1072	-	225	-	-
HCM Lane V/C Ratio	0.055	-	0.304	-	-
HCM Control Delay (s)	8.6	-	27.8	-	-
HCM Lane LOS	A	-	D	-	-
HCM 95th %tile Q(veh)	0.2	-	1.2	-	-

PM FUTURE WITH PROJECT  
3: JUANITA DR & NE 138TH PL

6/14/2015

**Intersection**

Int Delay, s/veh 1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	39	33	63	771	422	61
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	1	2	0
Mvmt Flow	41	35	66	812	444	64

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1420	476	508 0
Stage 1	476	-	- -
Stage 2	944	-	- -
Critical Hdwy	6.4	6.2	4.1 -
Critical Hdwy Stg 1	5.4	-	- -
Critical Hdwy Stg 2	5.4	-	- -
Follow-up Hdwy	3.5	3.3	2.2 -
Pot Cap-1 Maneuver	152	593	1067 -
Stage 1	629	-	- -
Stage 2	381	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	143	593	1067 -
Mov Cap-2 Maneuver	143	-	- -
Stage 1	629	-	- -
Stage 2	357	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	29.9	0.6	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1067	-	219	-	-
HCM Lane V/C Ratio	0.062	-	0.346	-	-
HCM Control Delay (s)	8.6	-	29.9	-	-
HCM Lane LOS	A	-	D	-	-
HCM 95th %tile Q(veh)	0.2	-	1.5	-	-

PM FUTURE WITH PROJECT  
6: 72ND AVE NE & SITE ACCESS

6/14/2015

**Intersection**

Int Delay, s/veh 4.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	7	4	0	12	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	8	4	0	13	8

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	38	4	0
Stage 1	4	-	-
Stage 2	34	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	979	1085	1631
Stage 1	1024	-	-
Stage 2	994	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	971	1085	1631
Mov Cap-2 Maneuver	971	-	-
Stage 1	1024	-	-
Stage 2	986	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.3	0	4.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 1085	1631	-
HCM Lane V/C Ratio	-	- 0.007	0.008	-
HCM Control Delay (s)	-	- 8.3	7.2	0
HCM Lane LOS	-	- A	A	A
HCM 95th %tile Q(veh)	-	- 0	0	-

AM FUTURE WITH PROJECT  
6: 72ND AVE NE & SITE ACCESS

6/14/2015

**Intersection**

Int Delay, s/veh 5.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	15	6	0	5	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	16	7	0	5	2

**Major/Minor**

	Minor1		Major1		Major2	
Conflicting Flow All	20	7	0	0	7	0
Stage 1	7	-	-	-	-	-
Stage 2	13	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	1002	1081	-	-	1627	-
Stage 1	1021	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	999	1081	-	-	1627	-
Mov Cap-2 Maneuver	999	-	-	-	-	-
Stage 1	1021	-	-	-	-	-
Stage 2	1012	-	-	-	-	-

**Approach**

	WB		NB		SB
HCM Control Delay, s	8.4		0		5.2
HCM LOS	A				

**Minor Lane/Major Mvmt**

	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1081	1627	-
HCM Lane V/C Ratio	-	-	0.015	0.003	-
HCM Control Delay (s)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-