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Bridal Trails
Traffic Impact Analysis

Prepared for: KLN Construction, Inc.
Jurisdiction: City of Kirkland
Tran14-02146

January 2015

GTC #14-236

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1. INTRODUCTION

Gibson Traffic Consultants, Inc. (GTC) has been retained to analyze the traffic impacts of the proposed Bridal Trails development. The 35 single-family-unit development is proposed will replace the five existing single-family units. The proposed development site is located at 4600-4646 116th Avenue NE. A site vicinity map is included in Figure 1. The development is proposed to have one access to 116th Avenue NE. The development is proposed to be constructed and fully occupied by 2019.

The findings of this analysis show that the development will not have a significant adverse impact on the surrounding roadway system.

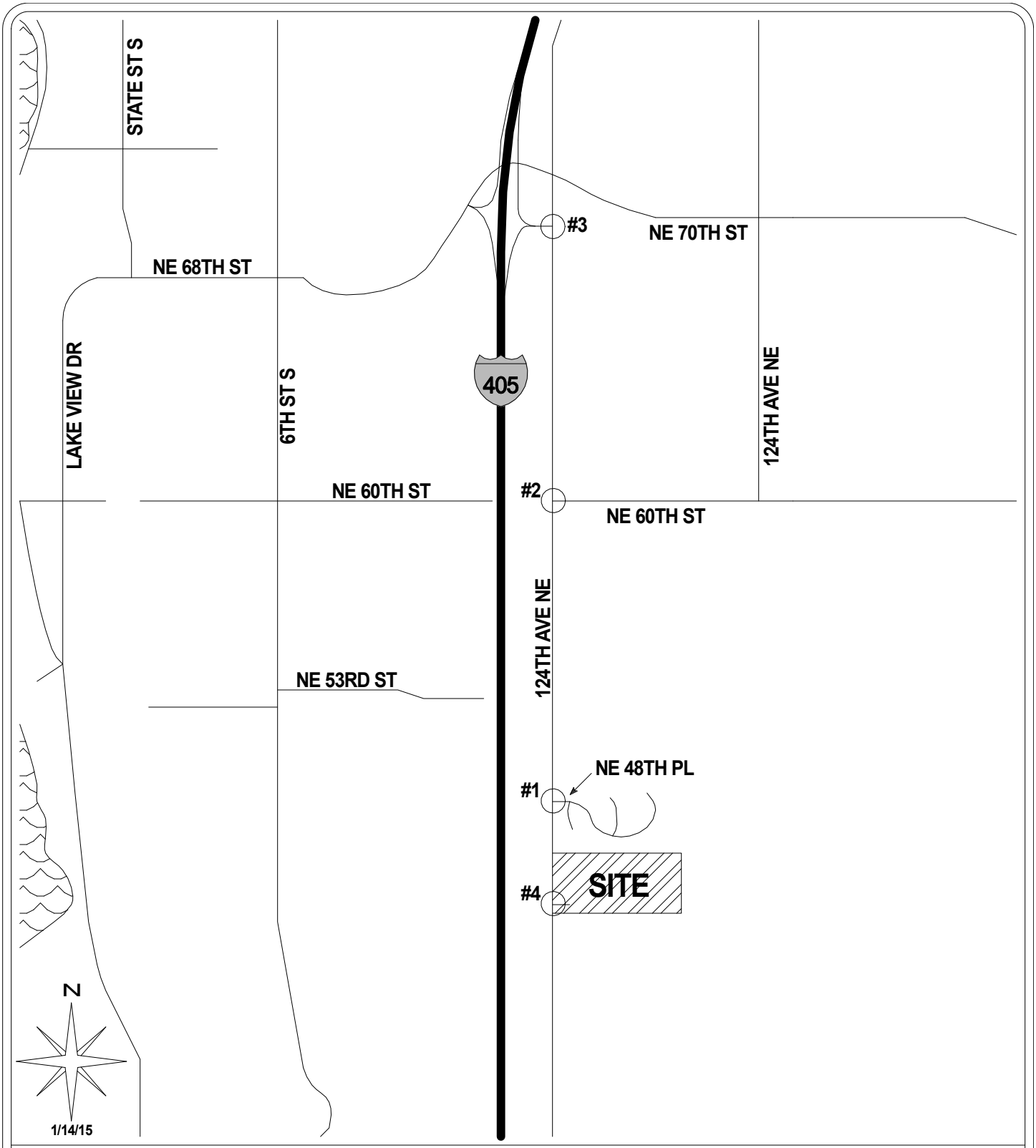
2. EXISTING CONDITIONS

The scope of the analysis is based on the current concurrency test that identified intersections that have a "significant" amount of development traffic through them. The critical off-site intersections of identified for concurrency were:

The weekday PM peak-hour, one hour between 4:00 PM and 6:00 PM, has been analyzed since the development will generate the greatest number of trips during the PM peak-hour and the historical data shows that the surrounding intersections have higher volumes during the weekday PM peak-hour than the weekday AM peak-hour.

The intersection level of service analysis has been performed for the existing conditions, 2019 baseline conditions and 2019 future with development conditions during the PM peak-hour. The site access intersection has only been analyzed for the 2019 future conditions with development.

The peak-hour level of service (LOS) analysis calculations were completed using the *Synchro 8, Build 805* software. This software applies the operational analysis methodology of the current *Highway Capacity Manual (HCM)*. Traffic congestion is generally measured in terms of level of service. In accordance with the 2010 HCM, road facilities and intersections are rated between LOS A and LOS F, with LOS A being free flow and LOS F being forced flow or over-capacity conditions. The level of service criteria is summarized in Table 1. The level of service at two-way stop-controlled intersections is based on the average delay of the worst approach. The level of service at signalized and all-way stop-controlled intersections is based on the average delay for all approaches. Geometric characteristics and conflicting traffic movements are taken into consideration when determining level of service values.



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TRAFFIC IMPACT STUDY
GTC #14-236

BRIDAL TRAILS
30 NEW SFD UNITS

CITY OF KIRKLAND

LEGEND

DEVELOPMENT SITE

STUDY INTERSECTION

FIGURE 1

SITE VICINITY MAP

Table 1: Level of Service Criteria for Intersections

Level of Service[1]	Expected Delay	Intersection Control Delay (Seconds per Vehicle)	
		Unsignalized Intersections	**Signalized** Intersections
A	Little/No Delay	≤10	≤10
B	Short Delays	>10 and ≤15	>10 and ≤20
C	Average Delays	>15 and ≤25	>20 and ≤35
D	Long Delays	>25 and ≤35	>35 and ≤55
E	Very Long Delays	>35 and ≤50	>55 and ≤80
F	Extreme Delays[2]	>50	>80

The City of Kirkland does not require SEPA mitigation for intersections that operate at LOS D or better. SEPA mitigation may be required for intersections that operate at LOS E or LOS F, depending on the intersection proportional share impacts.

2.1 Turning Movement Volumes

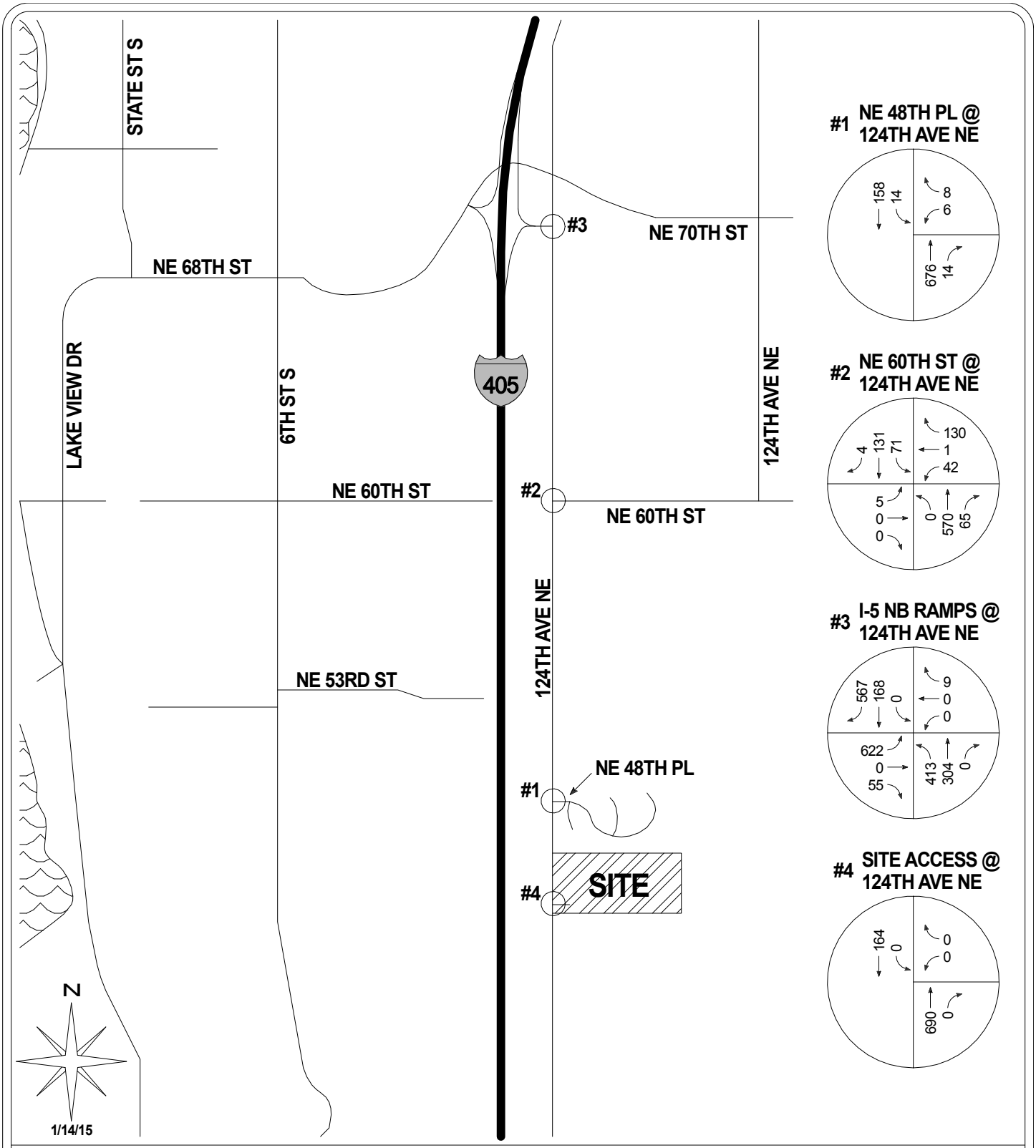
Existing turning movement counts were performed by iDax Data (iDax) at the study intersections on Tuesday December 16, 2014 between 4:00 PM and 6:00 PM. The existing turning movement volumes are shown in Figure 2. The study intersections are:

1. 116th Avenue NE at NE 48th Place – Minor Leg Stop Control
2. 116th Avenue NE at NE 60th Street – All-way Stop Control
3. 116th Avenue NE at I-405 NB Ramps – Signalized

[1] **Source:** *Highway Capacity Manual* 2010.

LOS A: Free-flow traffic conditions, with minimal delay to stopped vehicles (no vehicle is delayed longer than one cycle at signalized intersection).
LOS B: Generally stable traffic flow conditions.
LOS C: Occasional back-ups may develop, but delay to vehicles is short term and still tolerable.
LOS D: During short periods of the peak hour, delays to approaching vehicles may be substantial but are tolerable during times of less demand (i.e. vehicles delayed one cycle or less at signal).
LOS E: Intersections operate at or near capacity, with long queues developing on all approaches and long delays.
LOS F: Jammed conditions on all approaches with excessively long delays and vehicles unable to move at times.

[2] When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection.



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XXX → PM PEAK HOUR TURNING MOVEMENT VOLUMES

FIGURE 2
2014 EXISTING
INTERSECTION TURNING
MOVEMENTS PM PEAK HOUR

2.2 Existing Conditions Level of Service Analysis

An existing turning movement counts were performed at the study intersections on December 16, 2014 between 4:00 PM and 6:00 PM. The existing turning movement volumes are shown in Figure 2. The existing level of service analysis is based on signal phasing, peak-hour factors and heavy vehicle factors from the existing counts.

The study intersections along 116th Avenue NE all currently operates at LOS C. The intersection level of service analysis is summarized in Table 2.

Table 2: Existing Level of Service Summary

Intersection	Existing Conditions	
1. 116th Avenue NE at NE 48th Place	C	15.4 sec
2. 116th Avenue NE at NE 60th Street	C	20.4 sec
3. 116th Avenue NE at I-405 Northbound Ramps	C	25.9 sec

The intersection level of service calculations are included in the attachments.

3. TRIP GENERATION AND DISTRIBUTION

3.1 Trip Generation

Trip generation for the Bridal Trails development is based on national research data for similar developments contained in the Institute of Transportation Engineers (ITE) *Trip Generation, 9th Edition* (2012). The regression equation, per direction of the City, for ITE Land Use Code 210, single-family residential unit, was utilized in the trip generation calculations. The credit for the five existing units was reflected in the use of 30 units in the equation.

The Bridal Trails development is anticipated to generate 347 average daily trips (ADT) with 36 PM peak-hour trips. The development's trip generation is summarized in Table 3.

Table 3: Trip Generation Summary

Land Use	Size	Daily Trips	AM Peak-Hour			PM Peak-Hour		
			In	Out	Total	In	Out	Total
Single-Family Residential	30 Units	346.92	8	25	33	23	13	36

The trip generation calculations are included in the attachments.

3.2 Trip Distribution

The development's trip distribution is based on the current concurrency test model run. It is anticipated that 60% of the development's trips will travel along 116th Avenue NE to and from the north and 40% to and from the south. Detailed trip distributions are shown in Figure 3 for the PM peak-hour.

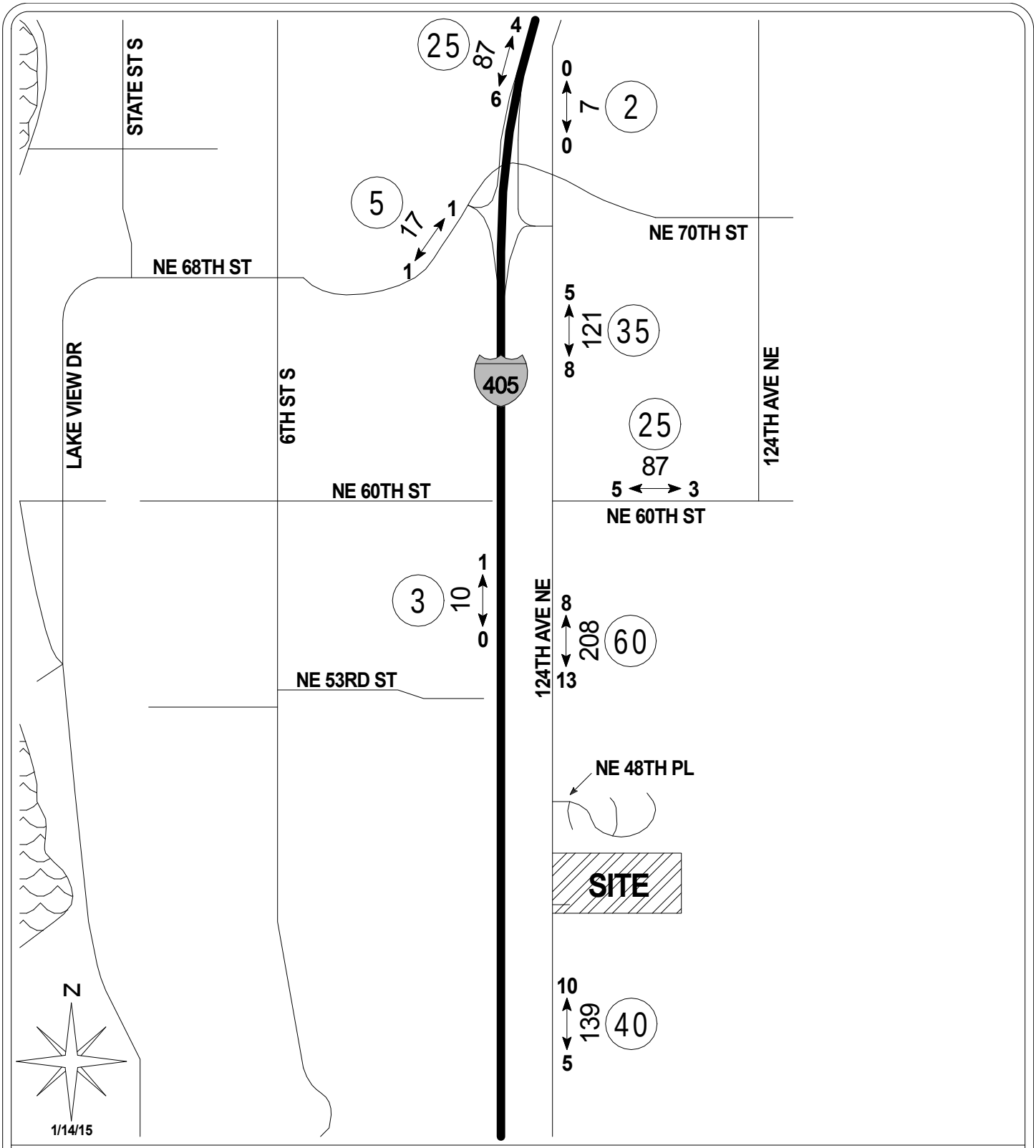
4. FUTURE ANALYSIS

4.1 Turning Movements

The 2019 baseline conditions turning movement volumes have been calculated by applying a 2% annually compounded to the existing turning movements. This growth rate is consistent with growth rates used for other developments within the City of Kirkland. The 2019 baseline conditions turning movements are shown in Figure 4. The 2019 future conditions with development turning movements have been calculated by adding the development's trips to the 2019 baseline conditions turning movements and are shown in Figure 5.

4.2 Level of Service Analysis

The level of service analysis for the 2019 baseline conditions and 2019 future conditions with development was performed using the same parameters as the existing conditions. The analysis shows that the study intersections will continue to operate at LOS D or better. The site access intersection is anticipated to operate at LOS C. A summary of the future level of service is included in Table 4.



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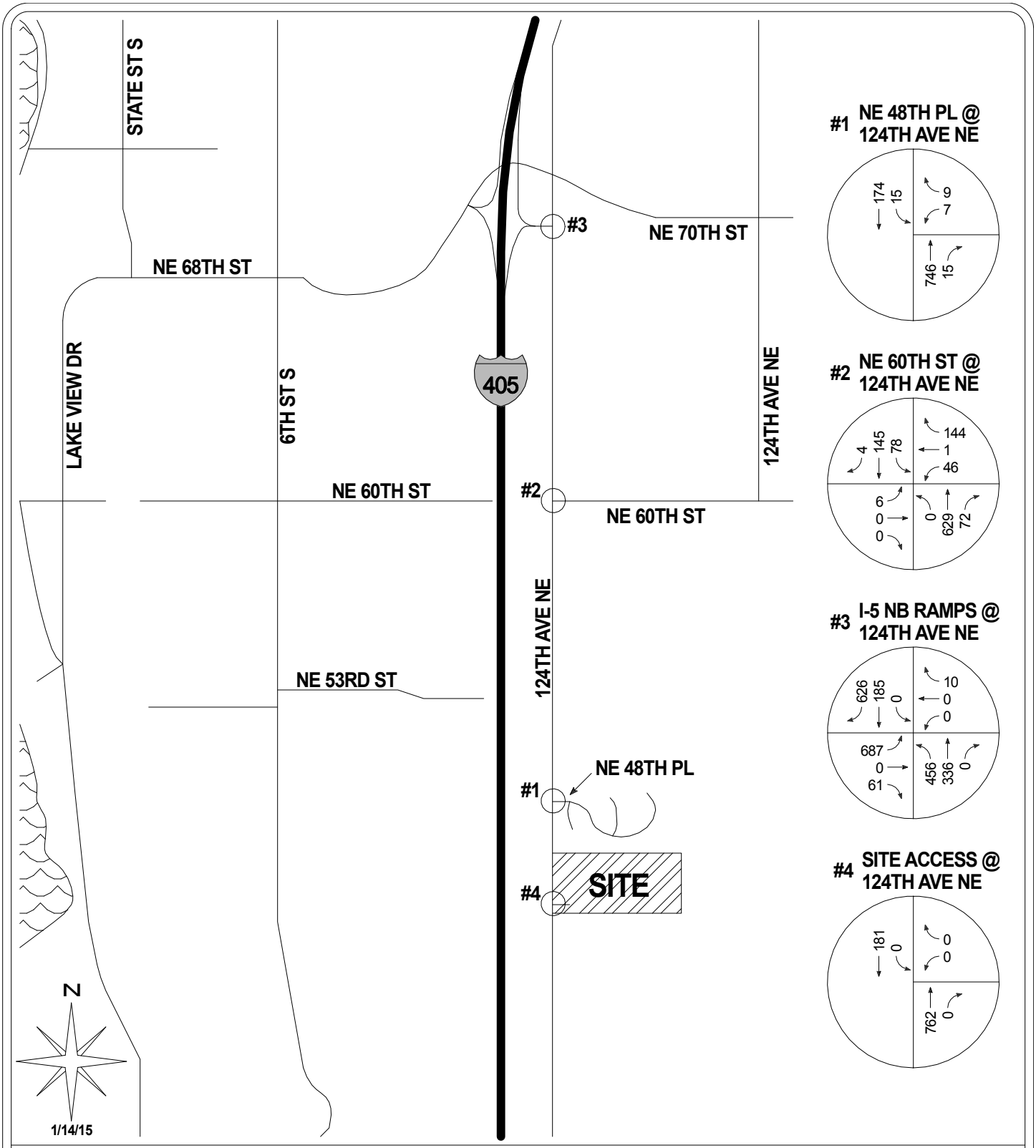
PM ← → PEAK NEW PM PEAK HOUR TRIPS

(XX) TRIP DISTRIBUTION %

FIGURE 3
DEVELOPMENT
TRIP DISTRIBUTION
PM PEAK-HOUR



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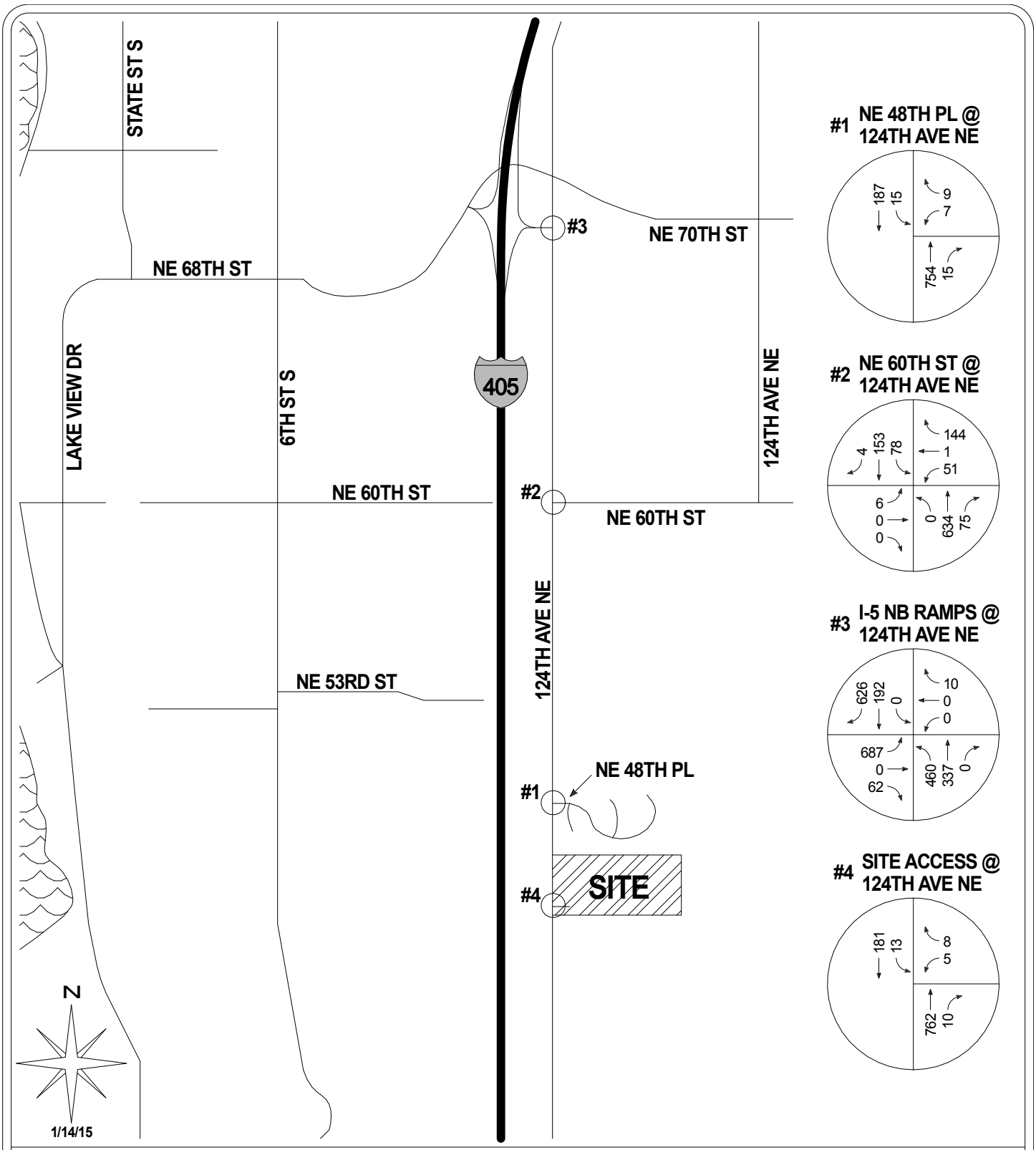
XXX → PM PEAK HOUR TURNING MOVEMENT VOLUMES

FIGURE 4
2019 BASELINE INTERSECTION TURNING MOVEMENTS PM PEAK HOUR



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XXX → PM PEAK HOUR TURNING MOVEMENT VOLUMES

FIGURE 5
2019 FUTURE WITH DEVELOPMENT INTERSECTION TURNING MOVEMENTS PM PEAK-HOUR

Table 4: Existing and Future Level of Service Summary

Intersection	Existing Conditions		2019 Baseline Conditions		2019 Future with Development Conditions	
1. 116th Avenue NE at NE 48th Place	C	15.4 sec	C	16.8 sec	C	17.1 sec
2. 116th Avenue NE at NE 60th Street	C	20.4 sec	D	29.9 sec	D	34.6 sec
3. 116th Avenue NE at I-405 Northbound Ramps	C	25.9 sec	C	29.4 sec	C	29.7 sec
4. 116th Avenue NE at Site Access	---	---	---	---	C	17.3 sec

The level of service calculations are included in the attachments.

5. SITE EVALUATION

The site access has been analyzed to determine if there is adequate sight distance and ensure the access operates acceptably. The posted speed limit is 35 mph along 116th Avenue NE a collector roadway.

5.1 Access Separation

The City of Kirkland identifies intersection spacing requirements in the *Department of Public Works Pre-Approved Plans Policy R-4* (February 2010). The City is the reviewing agency when determining access points along 116th Avenue NE (Collector). The City policy identifies that the driveway for the 35 houses would be classified as a Multi-Family/Non-Residential driveway which requires 50 feet of spacing measured edge-to-edge. The proposed access will have more than 50 feet of access spacing to the north and south.

5.2 Sight Distance Analysis

The City of Kirkland identifies intersection sight distance requirements in the *Department of Public Works Pre-Approved Plans Policy R-13* (January 2009). The driveway is classified based on the driveway PM peak volume and the major street Average Daily Traffic (ADT). The site will only generate 9 PM peak-hour trips; however, the major street ADT volume is greater than 6,000 trips. This identifies that the driveway type should be E2; the recommended sight distance for a posted speed limit of 35 mph is 390 feet. It should be noted that the minimum sight distance for the same posted speed limit is 250 feet.

The sight distance is measured from a point in the middle of the outbound lane, 14 feet on-site from the edge of traveled way to a point 390 feet away in the middle of the major roadway approach lane. The driveway will have at least 390 feet of sight distance in both directions with the frontage improvements and maintenance of trees in the right-of-way, **therefore satisfying the City of Kirkland standards.**

5.3 Collision Analysis

Collision data was obtained from WSDOT for the City intersections and along the site frontage. Data was obtained for more than a 5-year reporting period, January 1, 2009 through December 1, 2014. The data shows that there have been 5 collisions (3 rear end, 1 ditch, 1 opposite direction) that are related to the intersection of 116th Avenue NE at NE 60th Street within the reporting period. There were no fatalities and no pedestrian related collisions.

Along the site frontage there was 1 collision, it was a fixed object collision with no injury. The collision data is included in the attachments.

6. CONCLUSIONS

The 35 single-family-unit development is proposed will replace the five existing single-family units. The proposed development site is located at 4600-4646 116th Avenue NE. The development is anticipated to generate 347 daily trips with 36 PM peak-hour trips. The development will have one access to 116th Avenue NE and it will have adequate sight distance. The collision data shows that there is not a significant collision history along the development's frontage or at the City study intersections. The study intersections and the site access intersection are all anticipated to operate at LOS D or better, which is within City of Kirkland acceptable standards. Therefore, as there are no significant impacts at this time there should be no off-site traffic mitigation needed.

Trip Generation Calculations

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Trip Generation for: **Weekday**
(a.k.a.): **Average Weekday Daily Trips (AWDT)**

									NET EXTERNAL TRIPS BY TYPE											
									IN BOTH DIRECTIONS						DIRECTIONAL ASSIGNMENTS					
			Gross Trips				Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW	
LAND USES	VARIABLE	ITE LU code	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	In+Out (Total)	% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	In	Out	In	Out	In	Out
Single-family Residential	30 units	210	EQ	50%	50%	346.92	0%	0	347	0%	0	0%	0	347	0	0	0	0	173	174
Totals						346.92		0	347		0		0	347	0	0	0	0	173	174

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Trip Generation for: **Weekday, Peak Hour of Adjacent Street Traffic, One Hour between 7 and 9 AM**
(a.k.a.): **Weekday AM Peak Hour**

									NET EXTERNAL TRIPS BY TYPE											
									IN BOTH DIRECTIONS						DIRECTIONAL ASSIGNMENTS					
			Gross Trips				Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW	
LAND USES	**VARIABLE**	**ITE LU code**	**Trip Rate**	**% IN**	**% OUT**	**In+Out (Total)**	**% of Gross Trips**	**Trips In+Out (Total)**	**In+Out (Total)**	**% of Ext. Trips**	**In+Out (Total)**	**% of Ext. Trips**	**In+Out (Total)**	**In+Out (Total)**	**In**	**Out**	**In**	**Out**	**In**	**Out**
Single-family Residential	30 units	210	EQ	25%	75%	33	0%	0	33	0%	0	0%	0	33	0	0	0	0	8	25
Totals						33		0	33		0		0	33	0	0	0	0	8	25

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Trip Generation for: **Weekday, Peak Hour of Adjacent Street Traffic, One Hour between 4 and 6 PM**
(a.k.a.): **Weekday PM Peak Hour**

									NET EXTERNAL TRIPS BY TYPE											
									IN BOTH DIRECTIONS						DIRECTIONAL ASSIGNMENTS					
			Gross Trips				Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW	
LAND USES	VARIABLE	ITE LU code	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	In+Out (Total)	% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	In	Out	In	Out	In	Out
Single-family Residential	30 units	210	EQ	63%	37%	35.55	0%	0	36	0%	0	0%	0	35.55	0	0	0	0	22.40	13.15
Totals						35.55		0	36		0		0	35.55	0	0	0	0	22.40	13.15

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AM Version

%	New ADT	New AM Peak Hour Trips In	Out	Total	%	New ADT	New AM Peak Hour Trips In	Out	Total
100%	347	8	25	33	100%	347	8	25	33
1%	3.47	0.08	0.25	0.33	51%	176.93	4.08	12.81	16.89
2%	6.94	0.16	0.50	0.66	52%	180.40	4.16	13.06	17.22
3%	10.41	0.24	0.75	0.99	53%	183.87	4.24	13.31	17.55
4%	13.88	0.32	1.00	1.32	54%	187.34	4.32	13.56	17.88
5%	**17.35**	**0.40**	**1.26**	**1.66**	**55%**	**190.81**	**4.40**	**13.82**	**18.22**
6%	20.82	0.48	1.51	1.99	56%	194.28	4.48	14.07	18.55
7%	24.28	0.56	1.76	2.32	57%	197.74	4.56	14.32	18.88
8%	27.75	0.64	2.01	2.65	58%	201.21	4.64	14.57	19.21
9%	31.22	0.72	2.26	2.98	59%	204.68	4.72	14.82	19.54
10%	**34.69**	**0.80**	**2.51**	**3.31**	**60%**	**208.15**	**4.80**	**15.07**	**19.87**
11%	38.16	0.88	2.76	3.64	61%	211.62	4.88	15.32	20.20
12%	41.63	0.96	3.01	3.97	62%	215.09	4.96	15.57	20.53
13%	45.10	1.04	3.27	4.31	63%	218.56	5.04	15.83	20.87
14%	48.57	1.12	3.52	4.64	64%	222.03	5.12	16.08	21.20
15%	**52.04**	**1.20**	**3.77**	**4.97**	**65%**	**225.50**	**5.20**	**16.33**	**21.53**
16%	55.51	1.28	4.02	5.30	66%	228.97	5.28	16.58	21.86
17%	58.98	1.36	4.27	5.63	67%	232.44	5.36	16.83	22.19
18%	62.45	1.44	4.52	5.96	68%	235.91	5.44	17.08	22.52
19%	65.91	1.52	4.77	6.29	69%	239.37	5.52	17.33	22.85
20%	**69.38**	**1.60**	**5.02**	**6.62**	**70%**	**242.84**	**5.60**	**17.58**	**23.18**
21%	72.85	1.68	5.28	6.96	71%	246.31	5.68	17.84	23.52
22%	76.32	1.76	5.53	7.29	72%	249.78	5.76	18.09	23.85
23%	79.79	1.84	5.78	7.62	73%	253.25	5.84	18.34	24.18
24%	83.26	1.92	6.03	7.95	74%	256.72	5.92	18.59	24.51
25%	**86.73**	**2.00**	**6.28**	**8.28**	**75%**	**260.19**	**6.00**	**18.84**	**24.84**
26%	90.20	2.08	6.53	8.61	76%	263.66	6.08	19.09	25.17
27%	93.67	2.16	6.78	8.94	77%	267.13	6.16	19.34	25.50
28%	97.14	2.24	7.03	9.27	78%	270.60	6.24	19.59	25.83
29%	100.61	2.32	7.28	9.60	79%	274.07	6.32	19.84	26.16
30%	**104.08**	**2.40**	**7.54**	**9.94**	**80%**	**277.54**	**6.40**	**20.10**	**26.50**
31%	107.55	2.48	7.79	10.27	81%	281.01	6.48	20.35	26.83
32%	111.01	2.56	8.04	10.60	82%	284.47	6.56	20.60	27.16
33%	114.48	2.64	8.29	10.93	83%	287.94	6.64	20.85	27.49
34%	117.95	2.72	8.54	11.26	84%	291.41	6.72	21.10	27.82
35%	**121.42**	**2.80**	**8.79**	**11.59**	**85%**	**294.88**	**6.80**	**21.35**	**28.15**
36%	124.89	2.88	9.04	11.92	86%	298.35	6.88	21.60	28.48
37%	128.36	2.96	9.29	12.25	87%	301.82	6.96	21.85	28.81
38%	131.83	3.04	9.55	12.59	88%	305.29	7.04	22.11	29.15
39%	135.30	3.12	9.80	12.92	89%	308.76	7.12	22.36	29.48
40%	**138.77**	**3.20**	**10.05**	**13.25**	**90%**	**312.23**	**7.20**	**22.61**	**29.81**
41%	142.24	3.28	10.30	13.58	91%	315.70	7.28	22.86	30.14
42%	145.71	3.36	10.55	13.91	92%	319.17	7.36	23.11	30.47
43%	149.18	3.44	10.80	14.24	93%	322.64	7.44	23.36	30.80
44%	152.64	3.52	11.05	14.57	94%	326.10	7.52	23.61	31.13
45%	**156.11**	**3.60**	**11.30**	**14.90**	**95%**	**329.57**	**7.60**	**23.86**	**31.46**
46%	159.58	3.68	11.56	15.24	96%	333.04	7.68	24.12	31.80
47%	163.05	3.76	11.81	15.57	97%	336.51	7.76	24.37	32.13
48%	166.52	3.84	12.06	15.90	98%	339.98	7.84	24.62	32.46
49%	169.99	3.92	12.31	16.23	99%	343.45	7.92	24.87	32.79
50%	**173.46**	**4.00**	**12.56**	**16.56**	**100%**	**346.92**	**8.00**	**25.12**	**33.12**

Bridal Trails
GTC #14-236

PM Version

%	New ADT	New PM Peak Hour Trips In	Out	Total	%	New ADT	New PM Peak Hour Trips In	Out	Total
100%	346.92	22.40	13.15	35.55	100%	347	22	13	36
1%	3.47	0.22	0.13	0.36	51%	176.93	11.42	6.71	18.13
2%	6.94	0.45	0.26	0.71	52%	180.40	11.65	6.84	18.49
3%	10.41	0.67	0.39	1.07	53%	183.87	11.87	6.97	18.84
4%	13.88	0.90	0.53	1.42	54%	187.34	12.10	7.10	19.20
5%	**17.35**	**1.12**	**0.66**	**1.78**	**55%**	**190.81**	**12.32**	**7.23**	**19.55**
6%	20.82	1.34	0.79	2.13	56%	194.28	12.54	7.36	19.91
7%	24.28	1.57	0.92	2.49	57%	197.74	12.77	7.50	20.26
8%	27.75	1.79	1.05	2.84	58%	201.21	12.99	7.63	20.62
9%	31.22	2.02	1.18	3.20	59%	204.68	13.22	7.76	20.97
10%	**34.69**	**2.24**	**1.32**	**3.56**	**60%**	**208.15**	**13.44**	**7.89**	**21.33**
11%	38.16	2.46	1.45	3.91	61%	211.62	13.66	8.02	21.69
12%	41.63	2.69	1.58	4.27	62%	215.09	13.89	8.15	22.04
13%	45.10	2.91	1.71	4.62	63%	218.56	14.11	8.28	22.40
14%	48.57	3.14	1.84	4.98	64%	222.03	14.34	8.42	22.75
15%	**52.04**	**3.36**	**1.97**	**5.33**	**65%**	**225.50**	**14.56**	**8.55**	**23.11**
16%	55.51	3.58	2.10	5.69	66%	228.97	14.78	8.68	23.46
17%	58.98	3.81	2.24	6.04	67%	232.44	15.01	8.81	23.82
18%	62.45	4.03	2.37	6.40	68%	235.91	15.23	8.94	24.17
19%	65.91	4.26	2.50	6.75	69%	239.37	15.46	9.07	24.53
20%	**69.38**	**4.48**	**2.63**	**7.11**	**70%**	**242.84**	**15.68**	**9.21**	**24.89**
21%	72.85	4.70	2.76	7.47	71%	246.31	15.90	9.34	25.24
22%	76.32	4.93	2.89	7.82	72%	249.78	16.13	9.47	25.60
23%	79.79	5.15	3.02	8.18	73%	253.25	16.35	9.60	25.95
24%	83.26	5.38	3.16	8.53	74%	256.72	16.58	9.73	26.31
25%	**86.73**	**5.60**	**3.29**	**8.89**	**75%**	**260.19**	**16.80**	**9.86**	**26.66**
26%	90.20	5.82	3.42	9.24	76%	263.66	17.02	9.99	27.02
27%	93.67	6.05	3.55	9.60	77%	267.13	17.25	10.13	27.37
28%	97.14	6.27	3.68	9.95	78%	270.60	17.47	10.26	27.73
29%	100.61	6.50	3.81	10.31	79%	274.07	17.70	10.39	28.08
30%	**104.08**	**6.72**	**3.95**	**10.67**	**80%**	**277.54**	**17.92**	**10.52**	**28.44**
31%	107.55	6.94	4.08	11.02	81%	281.01	18.14	10.65	28.80
32%	111.01	7.17	4.21	11.38	82%	284.47	18.37	10.78	29.15
33%	114.48	7.39	4.34	11.73	83%	287.94	18.59	10.91	29.51
34%	117.95	7.62	4.47	12.09	84%	291.41	18.82	11.05	29.86
35%	**121.42**	**7.84**	**4.60**	**12.44**	**85%**	**294.88**	**19.04**	**11.18**	**30.22**
36%	124.89	8.06	4.73	12.80	86%	298.35	19.26	11.31	30.57
37%	128.36	8.29	4.87	13.15	87%	301.82	19.49	11.44	30.93
38%	131.83	8.51	5.00	13.51	88%	305.29	19.71	11.57	31.28
39%	135.30	8.74	5.13	13.86	89%	308.76	19.94	11.70	31.64
40%	**138.77**	**8.96**	**5.26**	**14.22**	**90%**	**312.23**	**20.16**	**11.84**	**32.00**
41%	142.24	9.18	5.39	14.58	91%	315.70	20.38	11.97	32.35
42%	145.71	9.41	5.52	14.93	92%	319.17	20.61	12.10	32.71
43%	149.18	9.63	5.65	15.29	93%	322.64	20.83	12.23	33.06
44%	152.64	9.86	5.79	15.64	94%	326.10	21.06	12.36	33.42
45%	**156.11**	**10.08**	**5.92**	**16.00**	**95%**	**329.57**	**21.28**	**12.49**	**33.77**
46%	159.58	10.30	6.05	16.35	96%	333.04	21.50	12.62	34.13
47%	163.05	10.53	6.18	16.71	97%	336.51	21.73	12.76	34.48
48%	166.52	10.75	6.31	17.06	98%	339.98	21.95	12.89	34.84
49%	169.99	10.98	6.44	17.42	99%	343.45	22.18	13.02	35.19
50%	**173.46**	**11.20**	**6.58**	**17.78**	**100%**	**346.92**	**22.40**	**13.15**	**35.55**

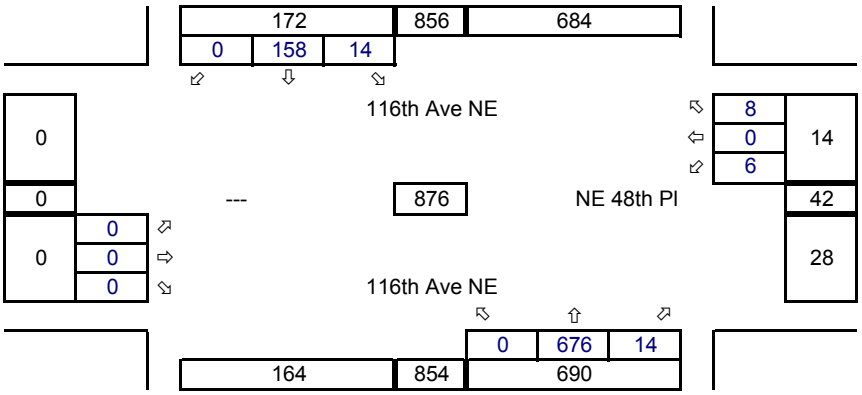
Turning Movements

Synchro ID: 1

Existing
Average Weekday
PM Peak Hour

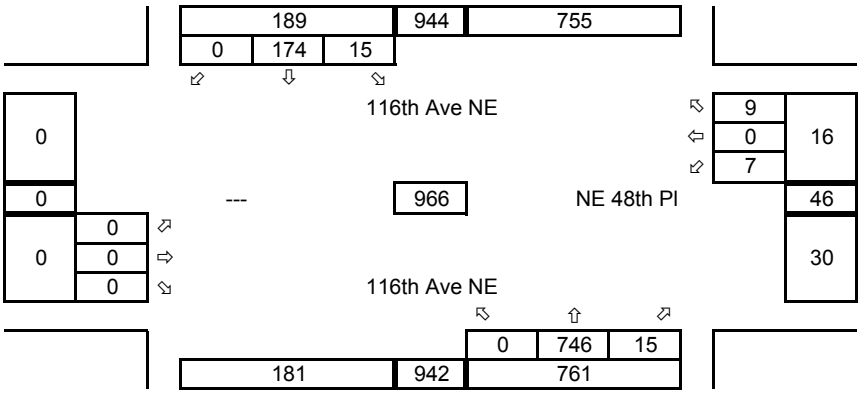
Year: **12/16/14**

Data Source: Idax Data

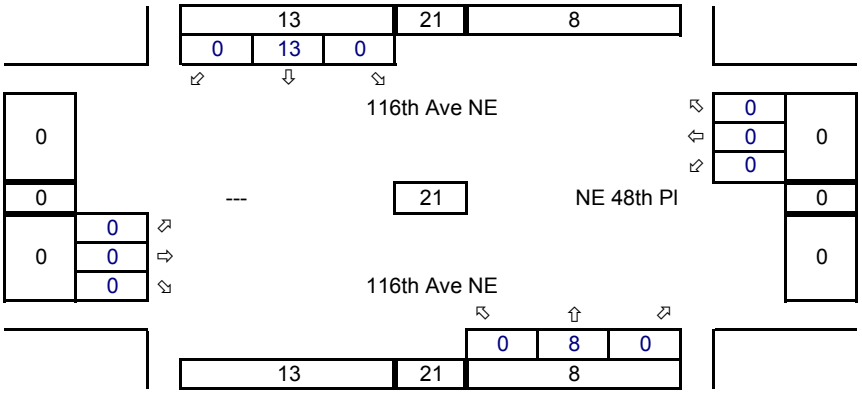


Future without Project
Average Weekday
PM Peak Hour

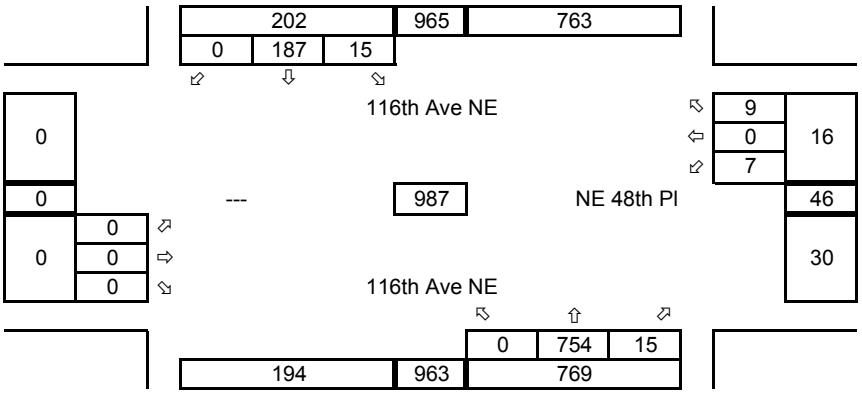
Year: 2019
Growth Rate = 2.0%
Years of Growth = 5
Total Growth = 1.1041



Total Project Trips
Average Weekday
PM Peak Hour



Future with Project
Average Weekday
PM Peak Hour

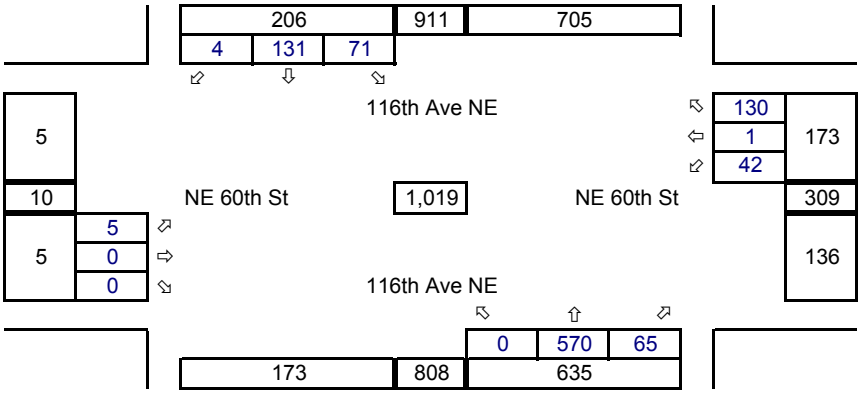


Synchro ID: 2

Existing
Average Weekday
PM Peak Hour

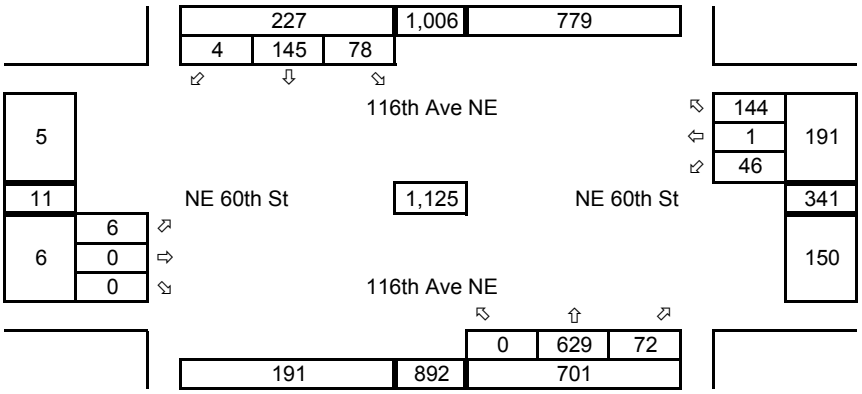
Year: **12/16/14**

Data Source: Idax Data

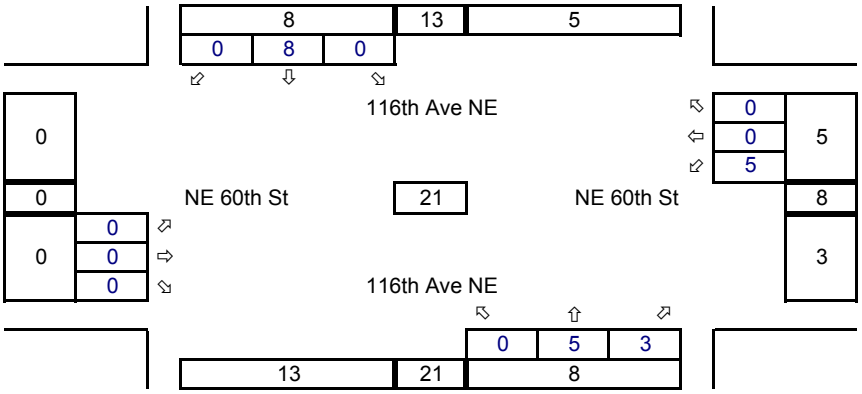


Future without Project
Average Weekday
PM Peak Hour

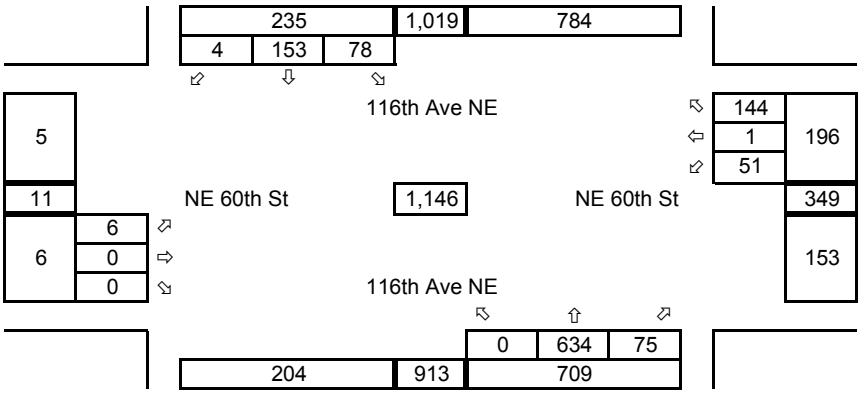
Year: 2019
Growth Rate = 2.0%
Years of Growth = 5
Total Growth = 1.1041



Total Project Trips
Average Weekday
PM Peak Hour



Future with Project
Average Weekday
PM Peak Hour

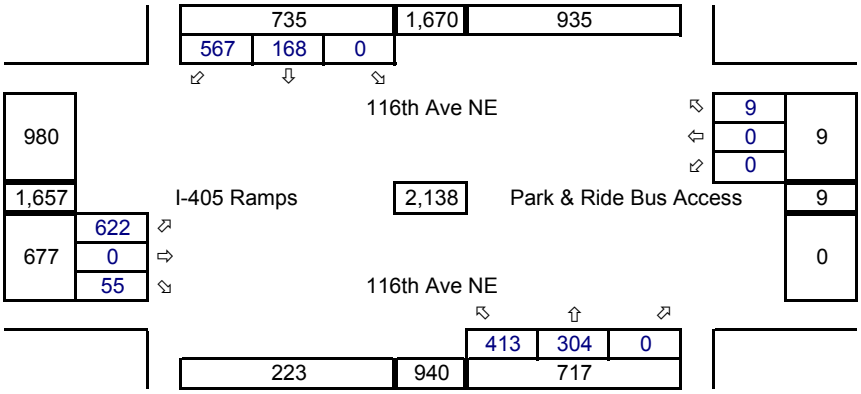


Synchro ID: 3

Existing
Average Weekday
PM Peak Hour

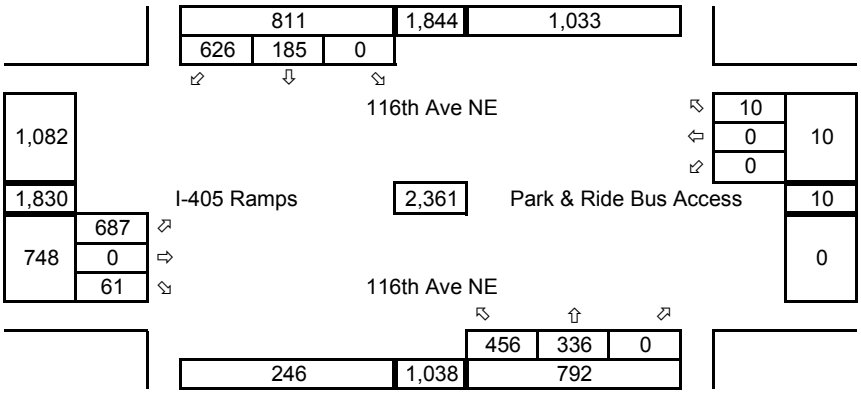
Year: **12/16/14**

Data Source: Idax Data

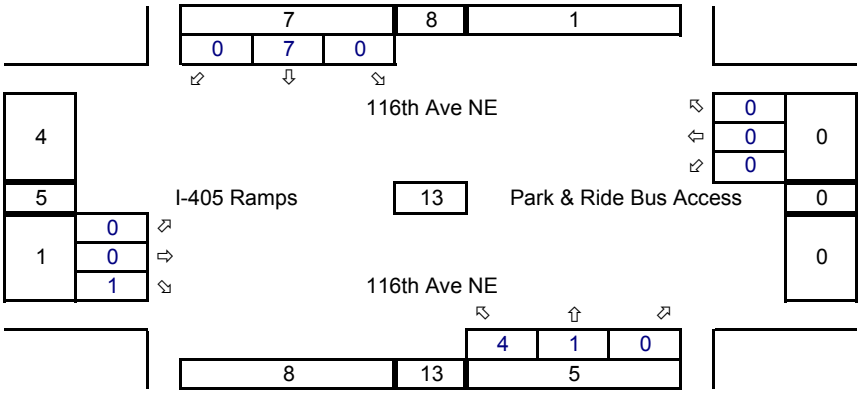


Future without Project
Average Weekday
PM Peak Hour

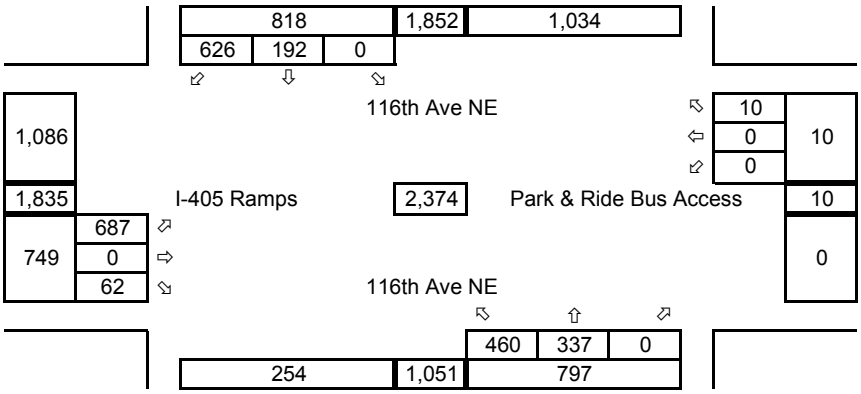
Year: 2019
Growth Rate = 2.0%
Years of Growth = 5
Total Growth = 1.1041



Total Project Trips
Average Weekday
PM Peak Hour



Future with Project
Average Weekday
PM Peak Hour



Synchro ID: 4

Existing
Average Weekday
PM Peak Hour

Year: **12/16/14**

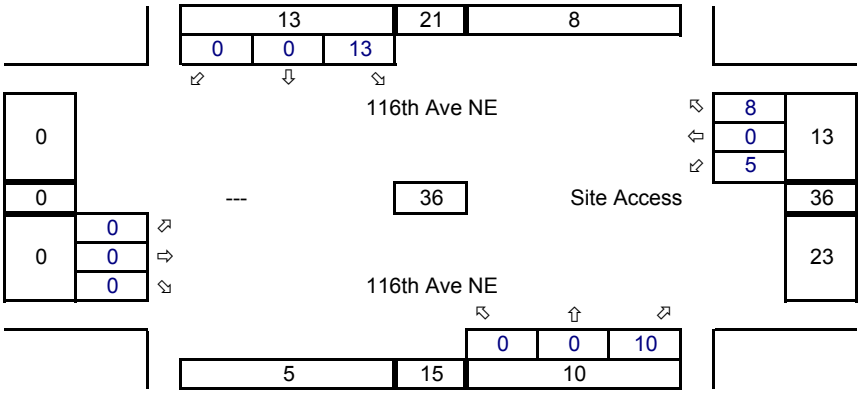
Data Source: Idax Data

-Extrapolated from 116th Ave NE at NE 48th Pl

Future without Project
Average Weekday
PM Peak Hour

Year: 2019
Growth Rate = 2.0%
Years of Growth = 5
Total Growth = 1.1041

Total Project Trips
Average Weekday
PM Peak Hour



Future with Project
Average Weekday
PM Peak Hour

2014 Existing LOS

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	6	8	676	14	14	158
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	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	6	8	712	15	15	166

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	915	719	0	0	726	0
Stage 1	719	-	-	-	-	-
Stage 2	196	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	304	430	-	-	882	-
Stage 1	484	-	-	-	-	-
Stage 2	840	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	298	430	-	-	882	-
Mov Cap-2 Maneuver	298	-	-	-	-	-
Stage 1	484	-	-	-	-	-
Stage 2	824	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.4	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	361	882	-
HCM Lane V/C Ratio	-	-	0.041	0.017	-
HCM Control Delay (s)	-	-	15.4	9.2	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Intersection Delay, s/veh	20.4
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	5	0	0	0	42	1	130	0	0	570	65
Peak Hour Factor	0.92	0.98	0.98	0.98	0.92	0.98	0.98	0.98	0.92	0.98	0.98	0.98
Heavy Vehicles, %	2	1	1	1	2	1	1	1	2	1	1	1
Mvmt Flow	0	5	0	0	0	43	1	133	0	0	582	66
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	9.7	10.7	26.2
HCM LOS	A	B	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	100%	24%	34%
Vol Thru, %	90%	0%	1%	64%
Vol Right, %	10%	0%	75%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	635	5	173	206
LT Vol	0	5	42	71
Through Vol	570	0	1	131
RT Vol	65	0	130	4
Lane Flow Rate	648	5	177	210
Geometry Grp	1	1	1	1
Degree of Util (X)	0.83	0.009	0.273	0.31
Departure Headway (Hd)	4.609	6.59	5.57	5.308
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	778	545	648	679
Service Time	2.703	4.609	3.578	3.322
HCM Lane V/C Ratio	0.833	0.009	0.273	0.309
HCM Control Delay	26.2	9.7	10.7	10.7
HCM Lane LOS	D	A	B	B
HCM 95th-tile Q	9.3	0	1.1	1.3

Intersection

Intersection Delay, s/veh
Intersection LOS

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	71	131	4
Peak Hour Factor	0.92	0.98	0.98	0.98
Heavy Vehicles, %	2	1	1	1
Mvmt Flow	0	72	134	4
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	10.7
HCM LOS	B

Lane

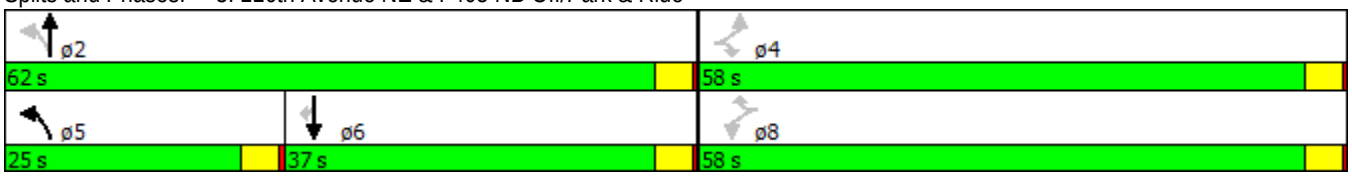
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	622	0	55	0	0	9	413	304	0	0	168	567
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	635		0	500		0	120		0	0		250
Storage Lanes	1		1	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850						0.850
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1770	0	1583	1863	0	1583	1770	1863	0	0	1863	1583
Flt Permitted	0.950						0.520					
Satd. Flow (perm)	1770	0	1583	1863	0	1583	969	1863	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			53			474						585
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		166			235			2537			1129	
Travel Time (s)		3.8			5.3			57.7			25.7	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	641	0	57	0	0	9	426	313	0	0	173	585
Shared Lane Traffic (%)												
Lane Group Flow (vph)	641	0	57	0	0	9	426	313	0	0	173	585
Turn Type	Perm		Perm	Perm		Perm	pm+pt	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases	4		4	8		8	2					6
Detector Phase	4		4	8		8	5	2			6	6
Switch Phase												
Minimum Initial (s)	4.0		4.0	4.0		4.0	4.0	4.0			4.0	4.0
Minimum Split (s)	20.0		20.0	20.0		20.0	8.0	20.0			20.0	20.0
Total Split (s)	58.0		58.0	58.0		58.0	25.0	62.0			37.0	37.0
Total Split (%)	48.3%		48.3%	48.3%		48.3%	20.8%	51.7%			30.8%	30.8%
Maximum Green (s)	54.0		54.0	54.0		54.0	21.0	58.0			33.0	33.0
Yellow Time (s)	3.5		3.5	3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)	0.5		0.5	0.5		0.5	0.5	0.5			0.5	0.5
Lost Time Adjust (s)	0.0		0.0	0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)	4.0		4.0	4.0		4.0	4.0	4.0			4.0	4.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)	3.0		3.0	3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode	None		None	None		None	None	Max			Max	Max
Walk Time (s)	5.0		5.0	5.0		5.0		5.0			5.0	5.0
Flash Dont Walk (s)	11.0		11.0	11.0		11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)	0		0	0		0		0			0	0
Act Effct Green (s)	43.7		43.7			43.7	58.4	58.4			35.9	35.9
Actuated g/C Ratio	0.40		0.40			0.40	0.53	0.53			0.33	0.33
v/c Ratio	0.91		0.09			0.01	0.66	0.32			0.29	0.64
Control Delay	49.7		6.1			0.0	23.6	17.4			32.5	6.5
Queue Delay	0.0		0.0			0.0	0.0	0.0			0.0	0.0
Total Delay	49.7		6.1			0.0	23.6	17.4			32.5	6.5
LOS	D		A			A	C	B			C	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay								21.0			12.5	
Approach LOS								C			B	
Queue Length 50th (ft)	419		2			0	183	123			95	0
Queue Length 95th (ft)	584		26			0	311	214			172	99
Internal Link Dist (ft)		86			155			2457			1049	
Turn Bay Length (ft)	635						120					250
Base Capacity (vph)	873		807			1021	667	987			605	909
Starvation Cap Reductn	0		0			0	0	0			0	0
Spillback Cap Reductn	0		0			0	0	0			0	0
Storage Cap Reductn	0		0			0	0	0			0	0
Reduced v/c Ratio	0.73		0.07			0.01	0.64	0.32			0.29	0.64

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 110.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 25.9 — Intersection LOS: C
Intersection Capacity Utilization 76.2% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: 116th Avenue NE & I-405 NB Off/Park & Ride



2019 Baseline LOS

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	7	9	746	15	15	174
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	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	7	9	785	16	16	183

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1008	793	0	0	801	0
Stage 1	793	-	-	-	-	-
Stage 2	215	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	268	390	-	-	827	-
Stage 1	447	-	-	-	-	-
Stage 2	823	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	262	390	-	-	827	-
Mov Cap-2 Maneuver	262	-	-	-	-	-
Stage 1	447	-	-	-	-	-
Stage 2	805	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.8	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	321	827	-
HCM Lane V/C Ratio	-	-	0.052	0.019	-
HCM Control Delay (s)	-	-	16.8	9.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Intersection Delay, s/veh	29.9
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	6	0	0	0	46	1	144	0	0	629	72
Peak Hour Factor	0.92	0.98	0.98	0.98	0.92	0.98	0.98	0.98	0.92	0.98	0.98	0.98
Heavy Vehicles, %	2	1	1	1	2	1	1	1	2	1	1	1
Mvmt Flow	0	6	0	0	0	47	1	147	0	0	642	73
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	10	11.5	41
HCM LOS	A	B	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	100%	24%	34%
Vol Thru, %	90%	0%	1%	64%
Vol Right, %	10%	0%	75%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	701	6	191	227
LT Vol	0	6	46	78
Through Vol	629	0	1	145
RT Vol	72	0	144	4
Lane Flow Rate	715	6	195	232
Geometry Grp	1	1	1	1
Degree of Util (X)	0.937	0.012	0.315	0.354
Departure Headway (Hd)	4.84	6.935	5.814	5.508
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	751	517	622	653
Service Time	2.84	4.964	3.826	3.532
HCM Lane V/C Ratio	0.952	0.012	0.314	0.355
HCM Control Delay	41	10	11.5	11.5
HCM Lane LOS	E	A	B	B
HCM 95th-tile Q	13.5	0	1.3	1.6

Intersection

Intersection Delay, s/veh
Intersection LOS

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	78	145	4
Peak Hour Factor	0.92	0.98	0.98	0.98
Heavy Vehicles, %	2	1	1	1
Mvmt Flow	0	80	148	4
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	11.5
HCM LOS	B

Lane

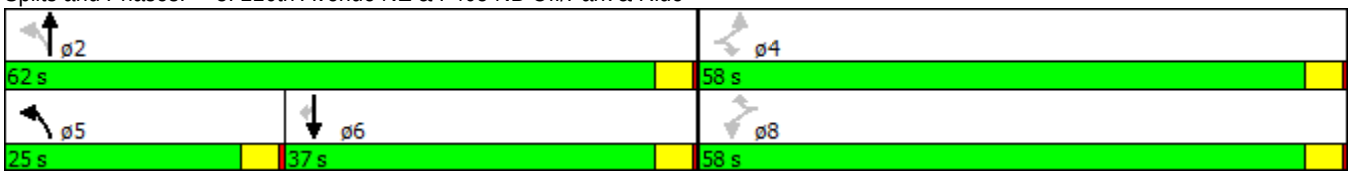
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	687	0	61	0	0	10	456	336	0	0	185	626
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	635		0	500		0	120		0	0		250
Storage Lanes	1		1	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850						0.850
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1770	0	1583	1863	0	1583	1770	1863	0	0	1863	1583
Flt Permitted	0.950						0.477					
Satd. Flow (perm)	1770	0	1583	1863	0	1583	889	1863	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			53			434						645
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		166			235			2537			1129	
Travel Time (s)		3.8			5.3			57.7			25.7	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	708	0	63	0	0	10	470	346	0	0	191	645
Shared Lane Traffic (%)												
Lane Group Flow (vph)	708	0	63	0	0	10	470	346	0	0	191	645
Turn Type	Perm		Perm	Perm		Perm	pm+pt	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases	4		4	8		8	2					6
Detector Phase	4		4	8		8	5	2			6	6
Switch Phase												
Minimum Initial (s)	4.0		4.0	4.0		4.0	4.0	4.0			4.0	4.0
Minimum Split (s)	20.0		20.0	20.0		20.0	8.0	20.0			20.0	20.0
Total Split (s)	58.0		58.0	58.0		58.0	25.0	62.0			37.0	37.0
Total Split (%)	48.3%		48.3%	48.3%		48.3%	20.8%	51.7%			30.8%	30.8%
Maximum Green (s)	54.0		54.0	54.0		54.0	21.0	58.0			33.0	33.0
Yellow Time (s)	3.5		3.5	3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)	0.5		0.5	0.5		0.5	0.5	0.5			0.5	0.5
Lost Time Adjust (s)	0.0		0.0	0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)	4.0		4.0	4.0		4.0	4.0	4.0			4.0	4.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)	3.0		3.0	3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode	None		None	None		None	None	Max			Max	Max
Walk Time (s)	5.0		5.0	5.0		5.0		5.0			5.0	5.0
Flash Dont Walk (s)	11.0		11.0	11.0		11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)	0		0	0		0		0			0	0
Act Effct Green (s)	48.8		48.8			48.8	58.2	58.2			34.2	34.2
Actuated g/C Ratio	0.42		0.42			0.42	0.51	0.51			0.30	0.30
v/c Ratio	0.94		0.09			0.01	0.78	0.37			0.35	0.70
Control Delay	53.7		6.9			0.0	31.5	19.7			35.8	7.3
Queue Delay	0.0		0.0			0.0	0.0	0.0			0.0	0.0
Total Delay	53.7		6.9			0.0	31.5	19.7			35.8	7.3
LOS	D		A			A	C	B			D	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay								26.5			13.8	
Approach LOS								C			B	
Queue Length 50th (ft)	492		4			0	249	165			120	0
Queue Length 95th (ft)	#733		30			0	#369	240			188	106
Internal Link Dist (ft)		86			155			2457			1049	
Turn Bay Length (ft)	635						120					250
Base Capacity (vph)	833		773			975	610	942			553	923
Starvation Cap Reductn	0		0			0	0	0			0	0
Spillback Cap Reductn	0		0			0	0	0			0	0
Storage Cap Reductn	0		0			0	0	0			0	0
Reduced v/c Ratio	0.85		0.08			0.01	0.77	0.37			0.35	0.70

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 115.1
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 29.4 Intersection LOS: C
Intersection Capacity Utilization 83.1% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: 116th Avenue NE & I-405 NB Off/Park & Ride



2019 Future With Development LOS

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	7	9	754	15	15	187
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	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	7	9	794	16	16	197

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1030	802	0	0	809	0
Stage 1	802	-	-	-	-	-
Stage 2	228	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	260	386	-	-	821	-
Stage 1	443	-	-	-	-	-
Stage 2	812	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	254	386	-	-	821	-
Mov Cap-2 Maneuver	254	-	-	-	-	-
Stage 1	443	-	-	-	-	-
Stage 2	794	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.1	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	314	821	-
HCM Lane V/C Ratio	-	-	0.054	0.019	-
HCM Control Delay (s)	-	-	17.1	9.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Intersection Delay, s/veh	34.6
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	6	0	0	0	51	1	144	0	0	634	75
Peak Hour Factor	0.92	0.98	0.98	0.98	0.92	0.98	0.98	0.98	0.92	0.98	0.98	0.98
Heavy Vehicles, %	2	1	1	1	2	1	1	1	2	1	1	1
Mvmt Flow	0	6	0	0	0	52	1	147	0	0	647	77
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	10.2	11.8	48.6
HCM LOS	B	B	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	100%	26%	33%
Vol Thru, %	89%	0%	1%	65%
Vol Right, %	11%	0%	73%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	709	6	196	235
LT Vol	0	6	51	78
Through Vol	634	0	1	153
RT Vol	75	0	144	4
Lane Flow Rate	723	6	200	240
Geometry Grp	1	1	1	1
Degree of Util (X)	0.974	0.012	0.327	0.37
Departure Headway (Hd)	4.848	7.009	5.877	5.55
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	745	508	610	647
Service Time	2.879	5.085	3.926	3.595
HCM Lane V/C Ratio	0.97	0.012	0.328	0.371
HCM Control Delay	48.6	10.2	11.8	11.8
HCM Lane LOS	E	B	B	B
HCM 95th-tile Q	15.3	0	1.4	1.7

Intersection

Intersection Delay, s/veh
Intersection LOS

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	78	153	4
Peak Hour Factor	0.92	0.98	0.98	0.98
Heavy Vehicles, %	2	1	1	1
Mvmt Flow	0	80	156	4
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	11.8
HCM LOS	B

Lane

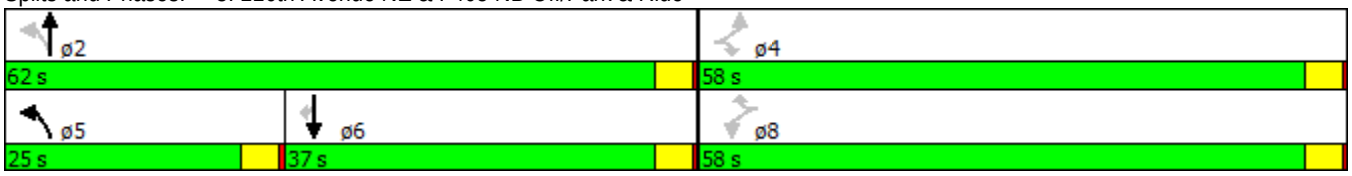
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	687	0	62	0	0	10	460	337	0	0	192	626
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	635		0	500		0	120		0	0		250
Storage Lanes	1		1	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850						0.850
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1770	0	1583	1863	0	1583	1770	1863	0	0	1863	1583
Flt Permitted	0.950						0.467					
Satd. Flow (perm)	1770	0	1583	1863	0	1583	870	1863	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			54			432						645
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		166			235			2537			1129	
Travel Time (s)		3.8			5.3			57.7			25.7	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	708	0	64	0	0	10	474	347	0	0	198	645
Shared Lane Traffic (%)												
Lane Group Flow (vph)	708	0	64	0	0	10	474	347	0	0	198	645
Turn Type	Perm		Perm	Perm		Perm	pm+pt	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases	4		4	8		8	2					6
Detector Phase	4		4	8		8	5	2			6	6
Switch Phase												
Minimum Initial (s)	4.0		4.0	4.0		4.0	4.0	4.0			4.0	4.0
Minimum Split (s)	20.0		20.0	20.0		20.0	8.0	20.0			20.0	20.0
Total Split (s)	58.0		58.0	58.0		58.0	25.0	62.0			37.0	37.0
Total Split (%)	48.3%		48.3%	48.3%		48.3%	20.8%	51.7%			30.8%	30.8%
Maximum Green (s)	54.0		54.0	54.0		54.0	21.0	58.0			33.0	33.0
Yellow Time (s)	3.5		3.5	3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)	0.5		0.5	0.5		0.5	0.5	0.5			0.5	0.5
Lost Time Adjust (s)	0.0		0.0	0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)	4.0		4.0	4.0		4.0	4.0	4.0			4.0	4.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)	3.0		3.0	3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode	None		None	None		None	None	Max			Max	Max
Walk Time (s)	5.0		5.0	5.0		5.0		5.0			5.0	5.0
Flash Dont Walk (s)	11.0		11.0	11.0		11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)	0		0	0		0		0			0	0
Act Effct Green (s)	48.8		48.8			48.8	58.2	58.2			34.1	34.1
Actuated g/C Ratio	0.42		0.42			0.42	0.51	0.51			0.30	0.30
v/c Ratio	0.94		0.09			0.01	0.79	0.37			0.36	0.70
Control Delay	53.7		6.8			0.0	32.4	19.7			36.0	7.3
Queue Delay	0.0		0.0			0.0	0.0	0.0			0.0	0.0
Total Delay	53.7		6.8			0.0	32.4	19.7			36.0	7.3
LOS	D		A			A	C	B			D	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay								27.1			14.1	
Approach LOS								C			B	
Queue Length 50th (ft)	492		4			0	252	166			125	0
Queue Length 95th (ft)	#733		30			0	#385	240			196	106
Internal Link Dist (ft)		86			155			2457			1049	
Turn Bay Length (ft)	635						120					250
Base Capacity (vph)	833		774			973	605	942			552	922
Starvation Cap Reductn	0		0			0	0	0			0	0
Spillback Cap Reductn	0		0			0	0	0			0	0
Storage Cap Reductn	0		0			0	0	0			0	0
Reduced v/c Ratio	0.85		0.08			0.01	0.78	0.37			0.36	0.70

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 115.1
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 29.7 Intersection LOS: C
Intersection Capacity Utilization 83.7% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: 116th Avenue NE & I-405 NB Off/Park & Ride



Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	5	8	762	10	13	181
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, %	2	2	2	2	2	2
Mvmt Flow	5	9	828	11	14	197

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1059	834	0	0	839	0
Stage 1	834	-	-	-	-	-
Stage 2	225	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	249	368	-	-	796	-
Stage 1	426	-	-	-	-	-
Stage 2	812	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	244	368	-	-	796	-
Mov Cap-2 Maneuver	244	-	-	-	-	-
Stage 1	426	-	-	-	-	-
Stage 2	796	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.3	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	308	796	-
HCM Lane V/C Ratio	-	-	0.046	0.018	-
HCM Control Delay (s)	-	-	17.3	9.6	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Collision Data

Washington State Department of Transportation
Lynn Peterson
Secretary of Transportation

Transportation Data and GIS Office
7345 Linderson Way Sw, Fl 1
Tumwater, WA 98501

360-570-2464 / Fax 360-570-2449
TTY: 1-800-833-6388
www.wsdot.wa.gov

December 17, 2014

Matthew Palmer
Gibson Traffic Consultants
2802 Wetmore Ave #220
Everett WA 98201

Dear Mr. Palmer :

In accordance with the Public Records Act, RCW 42.56, this letter acknowledges receipt of your request for records dated December 16, 2014 (Request Number PDR-14-3383).

We have prepared a history of officer reported collisions that occurred on all City Streets and State Routes in the City of Kirkland for the period of 1/1/2009 – available 2014 (*2014 is considered partial and preliminary*).

Federal law 23 United States Code Section 409 governs use of the data you requested. Under this law, data maintained for purposes of evaluating potential highway safety enhancements:

" . . . *shall not be subject to discovery or admitted into evidence in a federal or state court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.*" [Emphasis added.]

The Washington State Department of Transportation (WSDOT) is releasing this data to you with the understanding that you will not use this data contrary to the restrictions in Section 409, which means you will not use this data in discovery or as evidence at trial in any action for damages against the WSDOT, the State of Washington, or any other jurisdiction involved in the locations mentioned in the data. If you should attempt to use this data in an action for damages against WSDOT, the State of Washington, or any other jurisdiction involved in the locations mentioned in the data, these entities expressly reserve the right, under Section 409, to object to the use of the data, including any opinions drawn from the data.

With this package, your request for records is complete and closed.

If you have any further questions you may contact me at 360-570-2464.

Sincerely,

Julie Brown

Julie Brown
Transportation Planning Technician 3
Transportation Data and GIS Office

cc: w/enclosures
Nafisa Peshtaz & Lauretta Lew, WSDOT Northwest Region

OFFICER REPORTED COLLISIONS THAT OCCURRED ON ALL CITY STREETS AND STATE ROUTES IN THE CITY OF KIRKLAND
1/1/2009 - available 2014 *(2014 is considered partial and preliminary)*

UNDER 23 UNITED STATES CODE – SECTION 409, THIS DATA CANNOT BE USED IN DISCOVERY OR AS EVIDENCE AT TRIAL IN ANY ACTION FOR DAMAGES AGAINST THE WSDOT, OR ANY JURISDICTIONS INVOLVED IN THE DATA

JURISDICTION	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	#INJ	#FAT	#VEH	#PEDS	#PEDAL	VEHICLE 1 TYPE	VEHICLE 2 TYPE
City Street	116 AVE NE		NE 60 ST							E031311	10/1/2009	18:17	Possible Injury	1	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Passenger Car
City Street	116TH AVE NE	6000		80	F	N	NE 60TH ST			E373788	11/7/2014	8:00	No Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb
City Street	116TH AVE NE	4700		0.11	M	S	NE 48TH PL			E251704	6/21/2013	1:10	No Injury	0	0	1	0	0	Passenger Car	
City Street	116TH AVE NE	5800	NE 60TH ST							E052874	5/13/2010	0:49	Possible Injury	1	0	1	0	0	Passenger Car	
City Street	116TH AVE NE	6000	NE 60TH ST							E362283	10/4/2014	17:14	No Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Passenger Car
City Street	116TH AVE NE	5800	NE 60TH ST							E143674	12/18/2011	14:15	No Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb

JUNCTION RELATIONSHIP	ROADWAY SURFACE CONDITIONS	LIGHTING CONDITIONS	FIRST COLLISION TYPE / OBJECT STRUCK	VEH 1 ACTION	VEH 2 ACTION
At Intersection and Related	Wet	Dusk	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign
Intersection Related but Not at Intersection	Dry	Daylight	From same direction - both going straight - both moving - rear-end	Going Straight Ahead	Slowing
Not at Intersection and Not Related	Wet	Dark-No Street Lights	Tree or Stump (stationary)	Going Straight Ahead	
At Intersection and Related	Dry	Dark-Street Lights On	Roadway Ditch	Making Left Turn	
At Intersection and Not Related	Dry	Daylight	From same direction - both going straight - one stopped - rear-end	Slowing	Going Straight Ahead
At Intersection and Related	Dry	Daylight	From opposite direction - one left turn - one straight	Going Straight Ahead	Making Left Turn

MV DRIVER CONT CIRC 1 (UNIT 1)	MV DRIVER CONT CIRC 2 (UNIT 1)	MV DRIVER CONT CIRC 3 (UNIT 1)	MV DRIVER CONT CIRC 1 (UNIT 2)
Other	Follow Too Closely		None
Exceeding Reas. Safe Speed			None
Driver Distractions Outside Vehicle			
Under Influence of Alcohol	Exceeding Reas. Safe Speed	Disregard Stop Sign - Flashing Red	
Disregard Stop Sign - Flashing Red	Driver Operating Handheld Telecommunicat		None
Disregard Stop Sign - Flashing Red			None

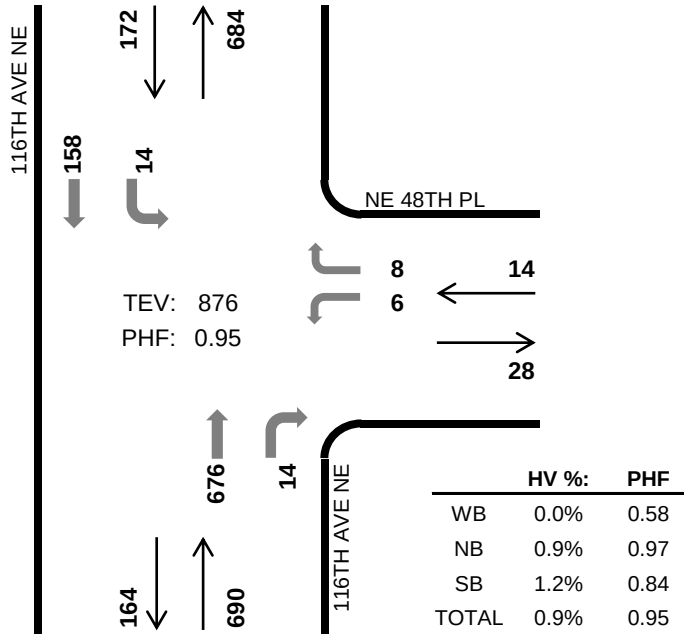
Traffic Counts

116TH AVE NE
NE 48TH PL

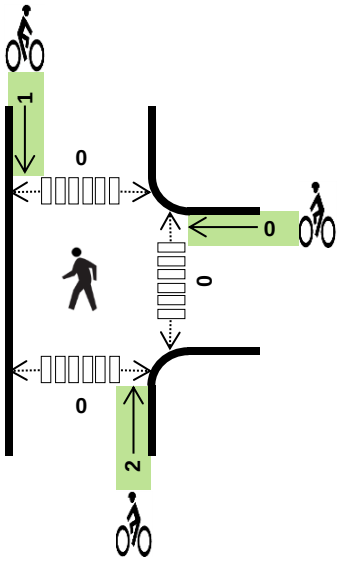
Date: Tue, Dec 16, 2014
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM

N

Peak Hour



	HV %:	PHF
WB	0.0%	0.58
NB	0.9%	0.97
SB	1.2%	0.84
TOTAL	0.9%	0.95



Two-Hour Count Summaries

Interval Start	NE 48TH PL Eastbound			NE 48TH PL Westbound			116TH AVE NE Northbound			116TH AVE NE Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	1	0	3	0	174	3	3	36	0	220	
4:15 PM	0	0	0	1	0	0	0	134	1	1	37	0	174	
4:30 PM	**0**	**0**	**0**	**2**	**0**	**4**	**0**	**169**	**5**	**6**	**30**	**0**	**216**	
4:45 PM	**0**	**0**	**0**	**1**	**0**	**2**	**0**	**163**	**1**	**2**	**40**	**0**	**209**	819
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**172**	**5**	**3**	**40**	**0**	**220**	819
5:15 PM	**0**	**0**	**0**	**3**	**0**	**2**	**0**	**172**	**3**	**3**	**48**	**0**	**231**	**876**
5:30 PM	0	0	0	1	0	2	0	139	3	1	44	0	190	850
5:45 PM	0	0	0	0	0	2	0	125	2	6	32	0	167	808
Count Total	0	0	0	9	0	15	0	1,248	23	25	307	0	1,627	
Peak Hr	**0**	**0**	**0**	**6**	**0**	**8**	**0**	**676**	**14**	**14**	**158**	**0**	**876**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	3	1	*4*	0	0	1	0	*1*	0	0	0	0	*0*
4:15 PM	0	0	2	1	*3*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	**0**	**0**	**2**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:45 PM	**0**	**0**	**4**	**0**	***4***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	***0***
5:00 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**2**	**0**	***2***	**0**	**0**	**0**	**0**	***0***
5:15 PM	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:30 PM	0	0	0	0	*0*	0	0	1	0	*1*	0	0	0	0	*0*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	0	11	4	*15*	0	0	4	1	*5*	0	0	0	0	*0*
Peak Hr	**0**	**0**	**6**	**2**	***8***	**0**	**0**	**2**	**1**	***3***	**0**	**0**	**0**	**0**	***0***

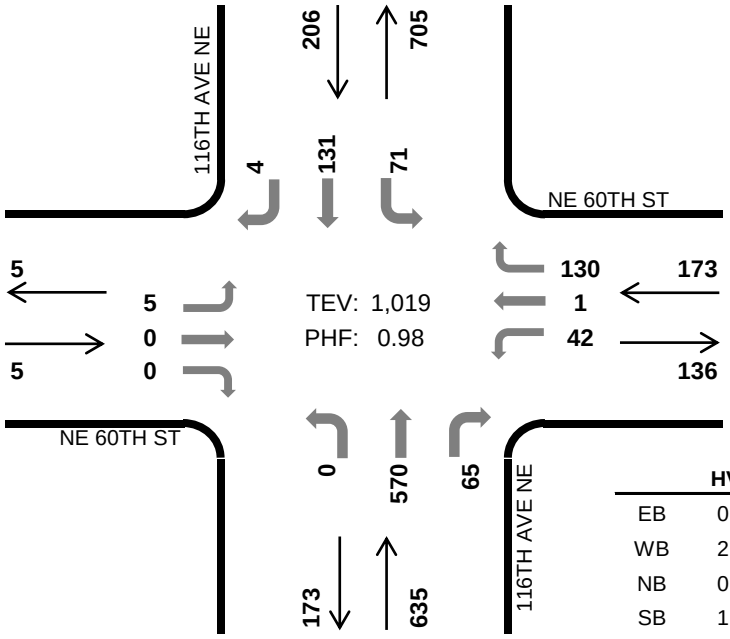
Mark Skaggs: 425 - 250 - 0777 mark.skaggs@idaxdata.com

116TH AVE NE
NE 60TH ST

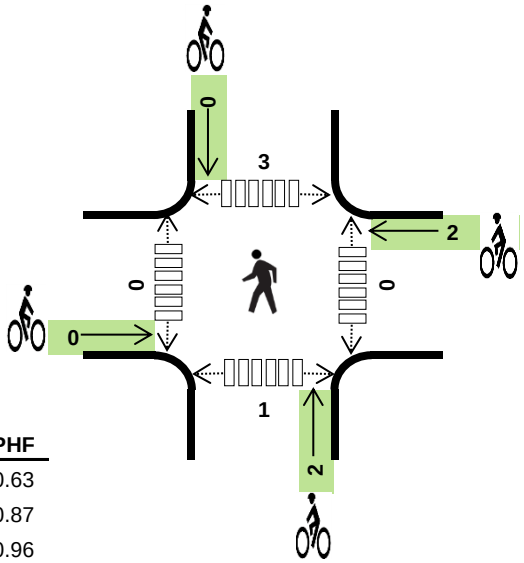
Date: Tue, Dec 16, 2014
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM

N

Peak Hour



	HV %:	PHF
EB	0.0%	0.63
WB	2.3%	0.87
NB	0.0%	0.96
SB	1.0%	0.89
TOTAL	0.6%	0.98



Two-Hour Count Summaries

Interval Start	NE 60TH ST Eastbound			NE 60TH ST Westbound			116TH AVE NE Northbound			116TH AVE NE Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	11	0	29	0	127	16	19	29	0	231	
4:15 PM	0	0	0	7	0	31	0	142	15	11	25	1	232	
4:30 PM	0	1	0	21	0	18	0	147	18	11	22	0	238	
4:45 PM	1	0	0	14	0	30	1	142	16	15	27	2	248	949
5:00 PM	**2**	**0**	**0**	**12**	**0**	**27**	**0**	**147**	**12**	**15**	**32**	**2**	**249**	967
5:15 PM	**1**	**0**	**0**	**11**	**0**	**27**	**0**	**141**	**18**	**16**	**41**	**1**	**256**	991
5:30 PM	**1**	**0**	**0**	**13**	**0**	**37**	**0**	**138**	**14**	**23**	**34**	**1**	**261**	1,014
5:45 PM	**1**	**0**	**0**	**6**	**1**	**39**	**0**	**144**	**21**	**17**	**24**	**0**	**253**	**1,019**
Count Total	6	1	0	95	1	238	1	1,128	130	127	234	7	1,968	
Peak Hr	**5**	**0**	**0**	**42**	**1**	**130**	**0**	**570**	**65**	**71**	**131**	**4**	**1,019**	

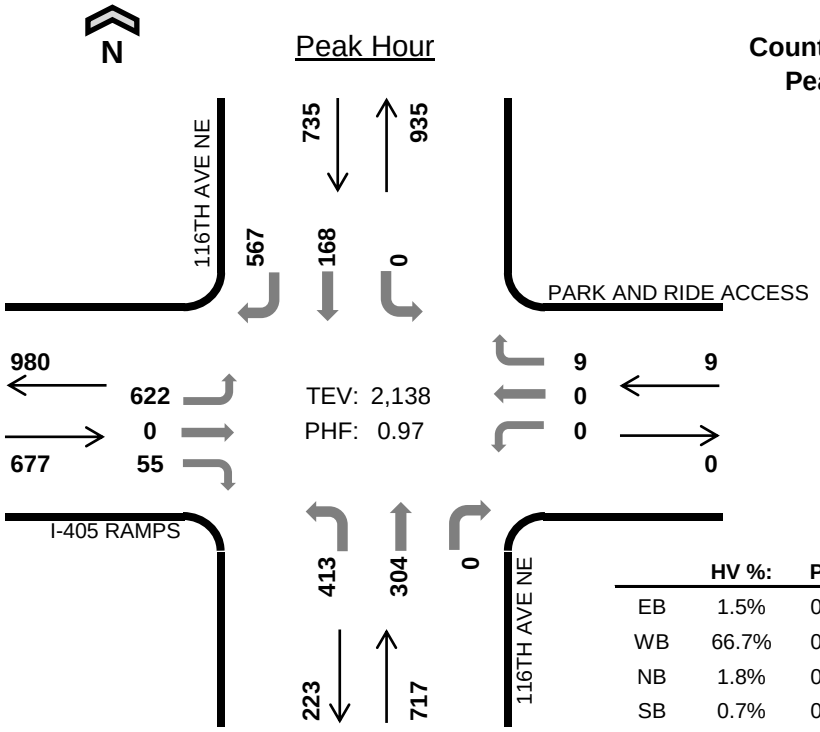
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	1	3	4	*8*	0	0	1	0	*1*	0	0	0	1	*1*
4:15 PM	0	7	2	4	*13*	1	0	0	0	*1*	1	0	1	0	*2*
4:30 PM	1	2	1	2	*6*	0	0	0	0	*0*	0	0	1	0	*1*
4:45 PM	0	3	4	1	*8*	0	0	0	0	*0*	0	0	0	0	*0*
5:00 PM	**0**	**2**	**0**	**0**	***2***	**0**	**1**	**1**	**0**	***2***	**0**	**0**	**2**	**1**	***3***
5:15 PM	**0**	**0**	**0**	**2**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:30 PM	**0**	**1**	**0**	**0**	***1***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**1**	**0**	***1***
5:45 PM	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***
Count Total	1	17	10	13	*41*	1	2	3	0	*6*	1	0	5	2	*8*
Peak Hr	**0**	**4**	**0**	**2**	***6***	**0**	**2**	**2**	**0**	***4***	**0**	**0**	**3**	**1**	***4***

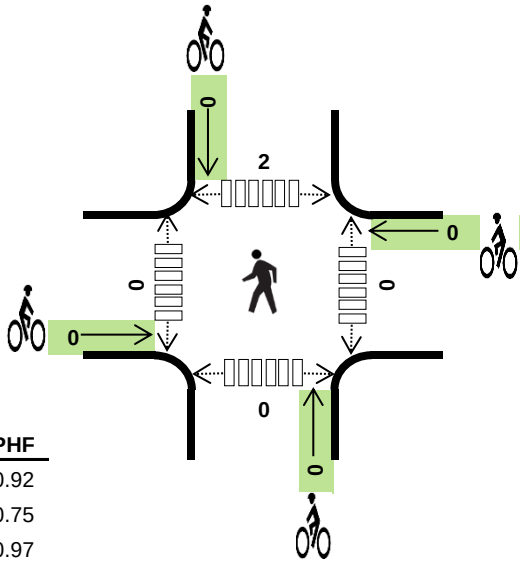
Mark Skaggs: 425 - 250 - 0777 mark.skaggs@idaxdata.com

116TH AVE NE
PARK AND RIDE ACCESS

Date: Tue, Dec 16, 2014
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	1.5%	0.92
WB	66.7%	0.75
NB	1.8%	0.97
SB	0.7%	0.92
TOTAL	1.6%	0.97



Two-Hour Count Summaries

Interval Start	I-405 RAMPS Eastbound LT	TH	RT	PARK AND RIDE ACCESS Westbound LT	TH	RT	116TH AVE NE Northbound LT	TH	RT	116TH AVE NE Southbound LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	181	0	16	0	0	3	100	76	0	0	36	112	524	
4:15 PM	163	0	12	0	0	0	103	76	0	0	35	110	499	
4:30 PM	**160**	**0**	**14**	**0**	**0**	**3**	**103**	**80**	**0**	**0**	**36**	**156**	**552**	
4:45 PM	**141**	**0**	**10**	**0**	**0**	**1**	**106**	**79**	**0**	**0**	**40**	**146**	**523**	2,098
5:00 PM	**167**	**0**	**16**	**0**	**0**	**3**	**108**	**75**	**0**	**0**	**40**	**117**	**526**	2,100
5:15 PM	**154**	**0**	**15**	**0**	**0**	**2**	**96**	**70**	**0**	**0**	**52**	**148**	**537**	**2,138**
5:30 PM	161	0	26	0	0	2	109	84	0	0	50	117	549	2,135
5:45 PM	164	0	30	0	2	1	105	74	1	0	33	112	522	2,134
Count Total	1,291	0	139	0	2	15	830	614	1	0	322	1,018	4,232	
Peak Hr	**622**	**0**	**55**	**0**	**0**	**9**	**413**	**304**	**0**	**0**	**168**	**567**	**2,138**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	8	3	2	3	*16*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	0	0	8	6	*14*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	**0**	**3**	**4**	**2**	***9***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**2**	**0**	***2***
4:45 PM	**4**	**1**	**5**	**0**	***10***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	**2**	**1**	**3**	**0**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:15 PM	**4**	**1**	**1**	**3**	***9***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:30 PM	1	1	2	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	1	0	1	3	*5*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	20	10	26	17	*73*	0	0	0	0	*0*	0	0	2	0	*2*
Peak Hr	**10**	**6**	**13**	**5**	***34***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**2**	**0**	***2***

Mark Skaggs: 425 - 250 - 0777 mark.skaggs@idaxdata.com

Concurrency Test

Proportional Share Impact Worksheet

Input appropriate information in green cells

[1] See "*Intersection Description*" worksheet for descriptions

1. May Change without notice, call Thang Nguyen 425-587-3869 with questions

			Through Lanes[1]
Project Name:	Bridal Trails SF Development		
Major Street[1]	116th Ave NE	# of Lanes*=	1
Minor Street[1]	Site Access	# of Lanes*=	1

DATE:

12/10/2014

Daily Project Traffic Entering the Intersection

		Daily Volumes	*Entering Leg Volumes**		
(Total of both approaches divided by two)	Major Street Volume V_1 =	112.24	97.6	126.88	*Major*
(Total of both approaches divided by two)	Minor Street Volume V_2 =	175.68	126.88	224.48	*Minor*

***Do not leave cell empty for zero volume**

Determine Geometric Factors

Number of Lanes		Geometric Factors			
Major Street	Minor Street	f_1	f_2	f_3	f_4
2	2	1.000	1.330	1.000	1.330
2	1	1.000	1.000	1.000	1.000
1	2	0.833	1.330	0.833	1.330
1	1	0.833	1.000	0.833	1.000

f_1	f_2	f_3	f_4
0.833	***1***	***0.833***	***1***

Calculate Base Percentages

$P_1=V_1/(10{,}000 \times f_1)$ =	1.35%
$P_2=V_2/(5{,}000 \times f_2)$ =	3.51%
$P_3=V_1/(15{,}000 \times f_3)$ =	0.90%
$P_4=V_2/(2{,}500 \times f_4)$ =	7.03%

Calculate Proportional Share

$S_1=(P_1+P_2)/2$=	2.43%
$S_2=(P_3+P_4)/2$=	3.96%

Intersection Proportional Share = Maximum of S1 and S2 = 3.96%

Significant Intersection? **yes**

1. Number of through lanes. Do not count exclusive turn lanes. Use the smaller number of lanes if the number of lanes is unequal on two legs. For Example, if one minor leg has two lanes and one minor leg has one lane, the number of lanes on the minor leg is one.

Computed By:	MJP
Company:	Gibson Traffic Consultants

Proportional Share Impact Worksheet

Input appropriate information in green cells

[1] See "*Intersection Description*" worksheet for descriptions

1. May Change without notice, call Thang Nguyen 425-587-3869 with questions

			Through Lanes[1]
Project Name:	Bridal Trails SF Development		
Major Street[1]	I-405 NB Ramp	# of Lanes*=	1
Minor Street[1]	116th Avenue NE	# of Lanes*=	1

DATE:

12/10/2014

Daily Project Traffic Entering the Intersection

		Daily Volumes	*Entering Leg Volumes**		
(Total of both approaches divided by two)	Major Street Volume V_1 =	4.88	9.76	0	*Major*
(Total of both approaches divided by two)	Minor Street Volume V_2 =	58.56	48.8	68.32	*Minor*

***Do not leave cell empty for zero volume**

Determine Geometric Factors

Number of Lanes		Geometric Factors			
Major Street	Minor Street	f_1	f_2	f_3	f_4
2	2	1.000	1.330	1.000	1.330
2	1	1.000	1.000	1.000	1.000
1	2	0.833	1.330	0.833	1.330
1	1	0.833	1.000	0.833	1.000

f_1	f_2	f_3	f_4
0.833	***1***	***0.833***	***1***

Calculate Base Percentages

$P_1=V_1/(10{,}000 \times f_1)$ =	0.06%
$P_2=V_2/(5{,}000 \times f_2)$ =	1.17%
$P_3=V_1/(15{,}000 \times f_3)$ =	0.04%
$P_4=V_2/(2{,}500 \times f_4)$ =	2.34%

Calculate Proportional Share

$S_1=(P_1+P_2)/2$=	0.61%
$S_2=(P_3+P_4)/2$=	1.19%

Intersection Proportional Share = Maximum of S1 and S2 = 1.19%

Significant Intersection? **yes**

1. Number of through lanes. Do not count exclusive turn lanes. Use the smaller number of lanes if the number of lanes is unequal on two legs. For Example, if one minor leg has two lanes and one minor leg has one lane, the number of lanes on the minor leg is one.

Computed By:	MJP
Company:	Gibson Traffic Consultants

Proportional Share Impact Worksheet

Input appropriate information in green cells

[1] See "*Intersection Description*" worksheet for descriptions

1. May Change without notice, call Thang Nguyen 425-587-3869 with questions

			Through Lanes[1]
Project Name:	Bridal Trails SF Development		
Major Street[1]	116th Avenue NE	# of Lanes*=	1
Minor Street[1]	NE 70th Street	# of Lanes*=	1

DATE:

1/1/2014

Daily Project Traffic Entering the Intersection

		Daily Volumes	*Entering Leg Volumes**		
(Total of both approaches divided by two)	Major Street Volume V_1 =	9.76	9.76	9.76	*Major*
(Total of both approaches divided by two)	Minor Street Volume V_2 =	29.28	58.56	0	*Minor*

***Do not leave cell empty for zero volume**

Determine Geometric Factors

Number of Lanes		Geometric Factors			
Major Street	Minor Street	f_1	f_2	f_3	f_4
2	2	1.000	1.330	1.000	1.330
2	1	1.000	1.000	1.000	1.000
1	2	0.833	1.330	0.833	1.330
1	1	0.833	1.000	0.833	1.000

f_1	f_2	f_3	f_4
0.833	***1***	***0.833***	***1***

Calculate Base Percentages

$P_1=V_1/(10{,}000 \times f_1)$ =	0.12%
$P_2=V_2/(5{,}000 \times f_2)$ =	0.59%
$P_3=V_1/(15{,}000 \times f_3)$ =	0.08%
$P_4=V_2/(2{,}500 \times f_4)$ =	1.17%

Calculate Proportional Share

$S_1=(P_1+P_2)/2$=	0.35%
$S_2=(P_3+P_4)/2$=	0.62%

Intersection Proportional Share = Maximum of S1 and S2 = 0.62%

Significant Intersection? **no**

1. Number of through lanes. Do not count exclusive turn lanes. Use the smaller number of lanes if the number of lanes is unequal on two legs. For Example, if one minor leg has two lanes and one minor leg has one lane, the number of lanes on the minor leg is one.

Computed By: MJP

Company: Gibson Traffic Consultants

CITY OF KIRKLAND
Department of Public Works
123 Fifth Avenue, Kirkland, WA 98033 425.587.3800
www.kirklandwa.gov

MEMORANDUM

To: Planning Department

From: Thang Nguyen, Transportation Engineer

Date: November 25, 2014

Subject: Bridal Trail Single-Family Subdivision Development Traffic Concurrency Test Notice, Tran14-02146.

The purpose of this memo is to inform you that the proposed Bridal Trail single family subdivision development has passed traffic concurrency.

Project Description
The applicant proposed to construct 35 single-family homes to replace five existing single-family homes located off 116th Avenue NE at approximately the 4200 block. The proposed project is anticipated to be completely built and occupied by 2017. The project is forecasted to generate 35 net new PM peak hour trips.

The proposed project passed traffic concurrency. 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 (November 25, 2015) unless a development permit and certificate of concurrency are issued or an extension is granted.

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

1. A complete SEPA checklist, traffic impact analysis and all required documentation are submitted to the City within 90 calendar days of the concurrency test notice.

2. A Certificate of Concurrency is issued or an extension is requested and granted by the Public Works Department within one year of issuance of the concurrency test notice. (A Certificate of Concurrency is issued at the same time a development permit or building permit is issued if the applicant holds a valid concurrency test notice.)

3. A Certificate of Concurrency shall expire six years from the date of issuance of the concurrency test notice unless all building permits are issued for buildings approved under the concurrency test notice.

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: Matt Palmer, Gibson Traffic Consultants, Inc.
Rob Jammerman, Development Engineer Manager
John Burkhalter, Senior Development Engineer

2017	Future w/o Project	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
101	Lake WA Blvd/NE 38th Pl	30	10	24	117	2	184	6	1291	111	93	984	5
102	Lake WA Blvd/Lakeview Dr	64	121	135	346	31	14	88	700	638	12	469	40
103	NE 68th St/State St	327	411	4	10	278	340	5	31	42	238	10	162
104	NE 68th St/108th Ave NE	215	461	65	186	375	261	142	429	250	258	278	111
105	Central Way/6th St	34	630	79	210	1051	203	198	308	345	100	96	63
106	Central Way/3rd St S	44	416	87	175	712	114	166	318	191	112	85	31
107	Central Way/Lake St	2	341	301	213	551	0	494	0	54	0	0	0
108	Lake St/Kirkland Ave	25	78	42	126	57	99	6	479	88	2	425	58
109	NE 85th St/114th Ave NE	10	1071	2	362	1446	464	27	84	661	314	19	6
110	6th St S/4th St	0	0	2	1	0	1	4	58	2	1	15	0
111	Kirkland Ave/3rd Street	1	33	22	0	15	10	8	10	0	0	4	1
112	Kirkland Way/6th Street	3	26	5	4	10	1	17	61	48	0	16	1
201	NE 116th St/98th Ave NE	112	257	233	78	439	92	559	888	152	172	373	106
202	NE 124th St/100th Ave NE	33	65	25	444	207	1017	36	891	275	375	442	34
203	NE 132nd St/100th Ave NE	81	147	93	73	231	580	266	1373	142	243	650	81
204	NE 132nd St/116th Way NE	9	376	246	124	670	27	547	44	210	15	31	10
205	Forbes Creek Dr/Market St	6	1	1	62	1	29	5	1553	67	17	658	9
206	NE 120th Pl/100th Ave NE	1	0	0	0	0	0	0	35	0	0	7	1
207	Juanita Dr/93rd Ave NE	0	9	0	0	19	0	0	0	0	0	0	0
208	Juanita Dr/97th Ave NE	0	9	0	0	18	2	0	0	0	0	0	0
209	n/a	0	0	0	0	0	0	0	0	0	0	0	0
211	n/a	0	0	0	0	0	0	0	0	0	0	0	0
301	NE 132nd St/120th Ave NE	4	436	69	145	431	4	136	6	397	1	4	8
302	NE 130th St/120th Ave NE	24	22	30	155	8	43	13	477	128	17	248	4
303	NE 128th St/120th Ave NE	145	150	146	150	216	23	88	463	97	19	295	168
304	NE 132nd St/124th Ave NE	427	334	15	58	314	287	26	243	155	118	79	210
306	NE 124th St/Slater Ave NE	206	1012	97	213	1201	223	167	613	336	152	228	218
307	Totem Lake Blvd/120th Ave NE	29	318	49	153	649	367	267	277	17	445	108	66
310	NE 116th St/120th Ave NE	106	490	19	201	655	433	29	151	266	318	177	140
311	NE 1166th St/124th Ave NE	193	409	204	130	583	104	455	711	299	130	331	179
312	NE 124th St/116th Way NE	135	735	76	208	1255	319	230	264	206	426	158	128
313	NE 124th St/113th Ave NE	45	680	48	72	1473	145	201	18	181	111	15	68
314	NE 120th St/Slater Ave NE	3	3	2	403	0	567	1	608	147	167	372	1
315	NE 124th St/124th Ave NE	145	949	258	132	1222	449	324	598	205	261	300	232
316	NE 132nd St/Totem Lake Blvd	117	371	127	62	488	25	299	224	118	11	67	53
317	NE 124th St/SB I-405 off Ramp	0	779	604	0	1316	459	0	0	0	622	0	533
318	NE 124th St/NB I-405 on/off Ramp	0	1115	298	0	1259	412	484	0	225	0	0	0
319	n/a	0	1	1	5	2	0	0	0	0	0	0	0
320	NE 116th St/NB I-405 off Ramp	0	515	0	298	855	0	477	3	371	0	2	0
324	NE 128th St/116th Way NE	0	0	0	0	3	1	0	4	0	3	4	0
325	NE 124th St/128th Lane NE	69	1260	6	3	1616	39	13	0	4	52	2	171
401	NE 85th St/132nd Ave NE	137	1262	89	51	1399	806	58	350	31	148	100	51
402	NE 85th St/124th Ave NE	323	1384	26	16	1053	259	141	440	21	208	136	202
403	NE 85th St/120th Ave NE	247	1576	137	30	1402	45	328	201	78	136	76	327
404	NE 100th St/124th Ave NE	9	10	30	51	23	175	29	1164	63	30	459	11
406	NE 70th St/132nd Ave NE	135	394	46	152	580	103	121	347	167	50	178	63
407	NE 70th St/116th Ave NE	239	449	467	231	442	53	309	587	250	20	101	186
408	NE 90th St/124th Ave NE	357	16	84	11	65	68	77	865	18	11	440	119
409	NE 85th St/122nd Ave NE	135	1597	60	38	1346	69	79	51	49	56	26	83
410	116th Ave NE/I-405 NB off Ramp	722	0	102	0	3	5	445	442	0	0	219	570
411	NE 70th St/I-405 SB off Ramp	0	0	0	276	1	272	0	894	175	182	739	0
999													
501	North Holmes Pt Dr NE/Juanita Dr NE	0	0	0	69	0	12	0	795	157	21	420	0
502	South Holmes Pt Dr NE/Juanita Dr NE	28	0	43	0	0	0	97	937	0	0	451	23
503	NE 141st Street/Juanita Dr NE	35	15	13	86	36	81	17	672	77	69	419	51
504	Juanita-Woodinville Way/100th Ave NE	58	35	30	304	30	60	68	1459	420	48	666	24
505	NE 137th Street/100th Avenue NE	0	0	0	0	0	0	0	11	0	0	4	0
506	Simonds Road/100th Avenue NE	297	0	380	0	0	0	595	774	0	0	330	364
507	NE 145th street/100th Avenue NE	4	5	0	355	11	220	14	771	264	105	326	5
508	NE 145th Street/Juanita-Woodinville Way	290	18	60	21	21	36	175	445	32	44	414	456
509	NE 140th Street/132nd Avenue NE	0	0	0	0	0	0	2	5	0	4	0	0
510	NE 132nd Street/132nd Avenue NE	159	143	193	29	241	235	340	637	39	54	228	57
511	NE 144th Street/124th Avenue NE	63	86	16	139	106	280	40	615	159	161	319	21
512	NE 124th Street/Willows Road NE	9	1028	438	119	630	73	843	374	422	126	116	31

6.12-2 additional volumes on auto network

additional volume
<NEWVDF> DRAFT MP0R15 2013 Baseyear
Scenario 200: Juanita Subdivision 35 SF
2014-11-21 16:55
DRAFT

2017	Future w Project	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
101	Lake WA Blvd/NE 38th Pl	30	10	24	117	2	184	6	1291	111	93	984	5
102	Lake WA Blvd/Lakeview Dr	64	121	135	346	31	14	88	700	638	12	469	40
103	NE 68th St/State St	327	411	4	10	278	340	5	31	42	238	10	162
104	NE 68th St/108th Ave NE	215	462	65	186	376	261	142	429	250	258	278	111
105	Central Way/6th St	34	630	79	210	1051	203	198	308	345	100	96	63
106	Central Way/3rd St S	44	416	87	175	712	114	166	318	191	112	85	31
107	Central Way/Lake St	2	341	301	213	551	0	494	0	54	0	0	0
108	Lake St/Kirkland Ave	25	78	42	126	57	99	6	479	88	2	425	58
109	NE 85th St/114th Ave NE	10	1071	2	362	1446	464	27	84	661	314	19	6
110	6th St S/4th St	0	0	2	1	0	1	4	58	2	1	15	0
111	Kirkland Ave/3rd Street	1	33	22	0	15	10	8	10	0	0	4	1
112	Kirkland Way/6th Street	3	26	5	4	10	1	17	61	48	0	16	1
201	NE 116th St/98th Ave NE	112	257	233	78	439	92	559	888	152	172	373	106
202	NE 124th St/100th Ave NE	33	65	25	444	207	1017	36	891	275	375	442	34
203	NE 132nd St/100th Ave NE	81	147	93	73	231	580	266	1373	142	243	650	81
204	NE 132nd St/116th Way NE	9	376	246	124	670	27	547	44	210	15	31	10
205	Forbes Creek Dr/Market St	6	1	1	62	1	29	5	1553	67	17	658	9
206	NE 120th Pl/100th Ave NE	1	0	0	0	0	0	0	35	0	0	7	1
207	Juanita Dr/93rd Ave NE	0	9	0	0	19	0	0	0	0	0	0	0
208	Juanita Dr/97th Ave NE	0	9	0	0	18	2	0	0	0	0	0	0
209	n/a	0	0	0	0	0	0	0	0	0	0	0	0
211	n/a	0	0	0	0	0	0	0	0	0	0	0	0
301	NE 132nd St/120th Ave NE	4	436	69	145	431	4	136	6	397	1	4	8
302	NE 130th St/120th Ave NE	24	22	30	155	8	43	13	477	128	17	248	4
303	NE 128th St/120th Ave NE	145	150	146	150	216	23	88	463	97	19	295	168
304	NE 132nd St/124th Ave NE	427	334	15	58	314	287	26	243	155	118	79	210
306	NE 124th St/Slater Ave NE	206	1012	97	213	1201	223	167	613	336	152	228	218
307	Totem Lake Blvd/120th Ave NE	29	318	49	153	649	367	267	277	17	445	108	66
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311	NE 1166th St/124th Ave NE	193	409	204	130	583	104	455	711	299	130	331	179
312	NE 124th St/116th Way NE	135	735	76	208	1255	319	230	264	206	426	158	128
313	NE 124th St/113th Ave NE	45	680	48	72	1473	145	201	18	181	111	15	68
314	NE 120th St/Slater Ave NE	3	3	2	403	0	567	1	608	147	167	372	1
315	NE 124th St/124th Ave NE	145	949	258	132	1222	449	324	598	205	261	300	232
316	NE 132nd St/Totem Lake Blvd	117	371	127	62	488	25	299	224	118	11	67	53
317	NE 124th St/SB I-405 off Ramp	0	779	604	0	1316	459	0	0	0	622	0	533
318	NE 124th St/NB I-405 on/off Ramp	0	1115	298	0	1259	412	484	0	225	0	0	0
319	n/a	0	1	1	5	2	0	0	0	0	0	0	0
320	NE 116th St/NB I-405 off Ramp	0	515	0	298	855	0	477	3	371	0	2	0
323	NE 128th St/116th Way NE	0	0	0	0	3	1	0	4	0	3	4	0
325	NE 124th St/128th Lane NE	69	1260	6	3	1616	39	13	0	4	52	2	171
401	NE 85th St/132nd Ave NE	137	1262	89	51	1399	806	58	350	31	148	100	51
402	NE 85th St/124th Ave NE	323	1384	26	16	1053	259	141	440	21	208	136	202
403	NE 85th St/120th Ave NE	247	1576	137	30	1402	45	328	201	78	136	76	327
404	NE 100th St/124th Ave NE	9	10	30	51	23	175	29	1164	63	30	459	11
406	NE 70th St/132nd Ave NE	135	395	46	155	580	103	121	347	167	50	179	63
407	NE 70th St/116th Ave NE	239	449	473	231	442	53	310	587	250	20	102	186
408	NE 90th St/124th Ave NE	357	16	84	11	65	68	77	865	18	11	440	119
409	NE 85th St/122nd Ave NE	135	1597	60	38	1346	69	79	51	49	56	26	83
410	116th Ave NE/I-405 NB off Ramp	722	0	103	0	3	5	449	443	0	0	219	570
411	NE 70th St/I-405 SB off Ramp	0	0	0	276	1	277	0	895	175	182	740	0
999		0	0	0	5	0	8	0	0	10	13	0	0
501	North Holmes Pt Dr NE/Juanita Dr NE	0	0	0	69	0	12	0	795	157	21	420	0
502	South Holmes Pt Dr NE/Juanita Dr NE	28	0	43	0	0	0	97	937	0	0	451	23
503	NE 141st Street/Juanita Dr NE	35	15	13	86	36	81	17	672	77	69	419	51
504	Juanita-Woodinville Way/100th Ave NE	58	35	30	304	30	60	68	1459	420	48	666	24
506	Simonds Road/100th Avenue NE	297	0	380	0	0	0	595	774	0	0	330	364
507	NE 145th street/100th Avenue NE	4	5	0	355	11	220	14	771	264	105	326	5
508	NE 145th Street/Juanita-Woodinville Way	290	18	60	21	21	36	175	445	32	44	414	456
510	NE 132nd Street/132nd Avenue NE	159	143	193	29	241	235	340	637	39	54	228	57
511	NE 144th Street/124th Avenue NE	63	86	16	139	106	280	40	615	159	161	319	21
512	NE 124th Street/Willows Road NE	9	1028	438	119	630	73	843	374	422	126	116	31

Site Plan

NOTES:

1) ENTRY ROADWAY LOCATED WITHIN 35 FT ROW.

2) EQUESTRIAN TRAIL LOCATED WITHIN 15 FT EASEMENT.

3) FRONTAGE IMPROVEMENTS: 12 FT TRAVEL LANE, 4 FT BIKE LANE, 5 FT PLANTER & 5 FT SIDEWALK.

4) SUPPLEMENTAL FRONTAGE IMPROVEMENTS ON CITY PARCEL: 12 FT TRAVEL LANE, 4 FT BIKE LANE, 5 FT PLANTER & 5 FT SIDEWALK.

5) SIDEWALK ON NORTH SIDE OF CUL-DE-SAC ONLY.

PROPOSED SITE PLAN, FRONTAGE IMPROVEMENTS & TREE RETENTION PLAN

KLN CONSTRUCTION, INC.

SEAL

REVISION	DATE
2	JULY 2014

DESIGN

Ben Giddings

Patrick McJunkin

PROJECT NUMBER

SHEET NUMBER

1 of 1