City of Bellevue

Transportation Analysis Report
Lakemont Boulevard SE & Forest Drive SE

Bellevue, WA

July 2019

Contract # 1850215

PREPARED FOR

CITY OF BELLEVUE WASHINGTON

PREPARED BY

ReidMiddleton

City of Bellevue Neighborhood Congestion Reduction Program
Lakemont Boulevard SE/Forest Drive SE Transportation Analysis Report
Contract Number 1850215
July 2019

The engineering material and data contained in this report were prepared under the supervision and direction of the undersigned, whose seal as registered professional engineer is affixed below.

7/18/2019

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INTRODUCTION

In November 2016, voters passed the Neighborhood Safety, Connectivity and Congestion Levy, which helps the city address a backlog of needs organized into the following six categories: neighborhood safety; bicycle facilities; new sidewalks; sidewalk and trail maintenance; traffic management technology; and neighborhood congestion reduction. The levy provides approximately $2 million per year for the Neighborhood Congestion Reduction Program that focuses on reducing motor vehicle congestion for residents traveling to and from their neighborhoods. Levy funding pays for the planning, public outreach, design and construction of projects that rate the highest for reducing congestion. This study falls under the Neighborhood Congestion Reduction program.

City of Bellevue staff compiled a list of congested intersections and corridors in the city to start this program and then worked with the Transportation Commission in 2018 to develop scoring criteria to rank these projects. Nine locations were selected for evaluation in 2018. After this study is completed, the City will compare the benefits and costs of this project with other Neighborhood Congestion Reduction projects throughout the city to determine which projects will move forward to design and construction.

Background

Lakemont Boulevard SE provides access to residential neighborhoods, schools, parks, and employment centers, and travel between Interstate 90 (I-90) and Cougar Mountain/Lakemont. The T intersection of Lakemont Boulevard SE and Forest Drive SE was chosen for this evaluation because of the difficulty traffic on Forest Drive SE has entering Lakemont Boulevard SE, particularly when making a left turn, and the significant queueing that occurs on Forest Drive SE as a result. Figure 1 shows the project location. Forest Drive SE is controlled by a stop sign, while Lakemont Boulevard SE is uncontrolled. The existing intersection has experienced seven collisions over the past five years. The majority of the collisions were rear-end crashes. The intersection is being evaluated to assess future capacity, level-of-service (LOS), and operational safety.

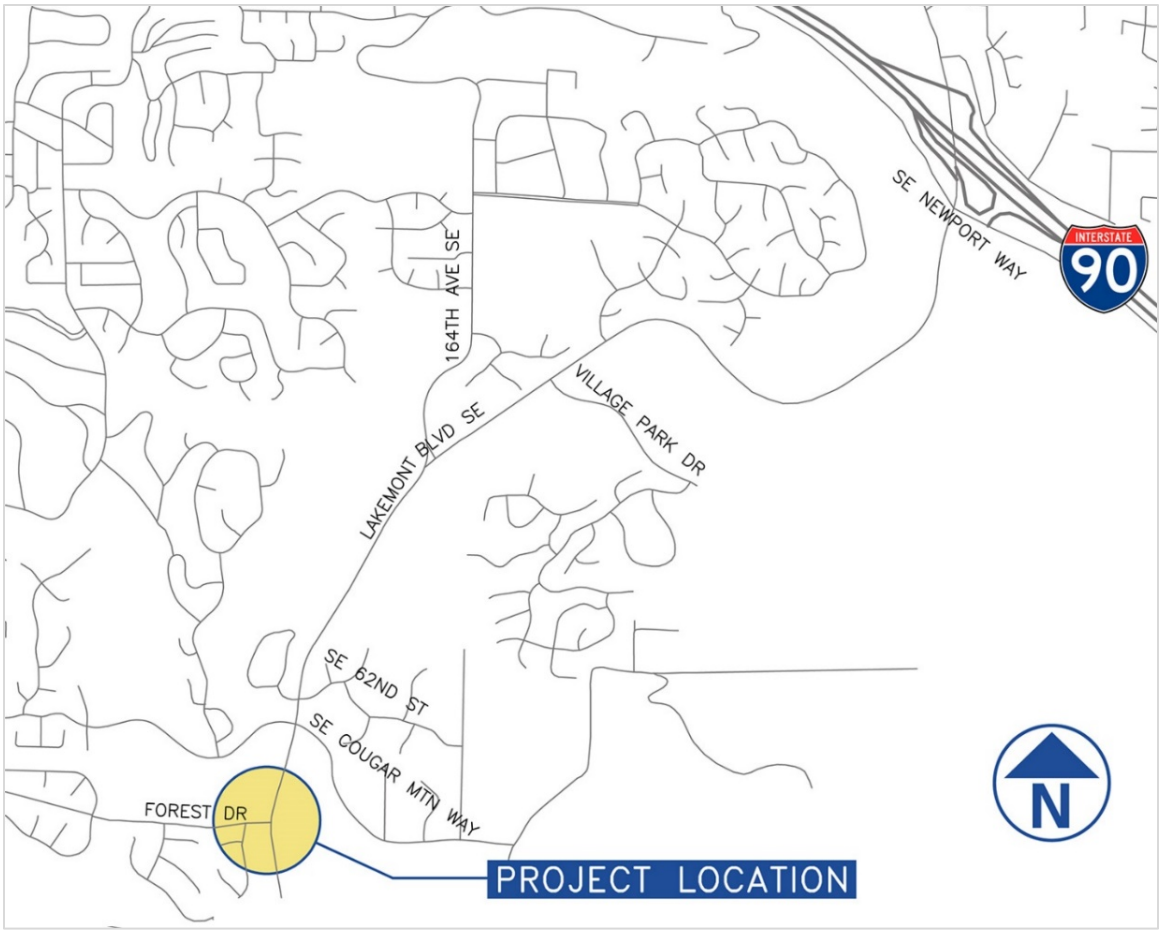

Figure 1. Vicinity Map.

Purpose

This report summarizes the analysis performed for the Lakemont Boulevard SE and Forest Drive SE intersection. The study includes evaluation of existing conditions, future no-build conditions, and analysis of conceptual design alternatives for the intersection. The alternatives analysis includes advantages and disadvantages of each alternative, preliminary analysis of probable costs, and assessment of multimodal and safety impacts related to each alternative. A conceptual layout of the preferred alternative is included, along with the challenges and risks associated with the proposed alternative.

EXISTING CONDITIONS

Traffic Conditions

Lakemont Boulevard SE and Forest Drive SE are two-lane roadways located in the primarily residential neighborhood of Cougar Mountain/Lakemont. There are several trails and parks nearby (Coal Creek Natural Area, Cougar Mountain Regional Wildland Park, Lewis Creek Park, Lakemont Highlands Neighborhood Park) along with one private school (Open Window School). King County Metro operates bus route 824 along Lakemont Boulevard SE through the intersection once in the morning and once in the afternoon.

Forest Drive SE has 5-foot sidewalks on both sides of the roadway with recent curb ramp installations at the intersection with Forest Drive SE. Lakemont Boulevard SE has narrow paved shoulders south of the intersection and marked bike lane/shoulders to the north. Forest Drive SE is controlled by a stop sign. The posted speed is 30 MPH for all approaches; however, the speed limit changes to 40 MPH south of the intersection. Traffic counts were conducted in November 2018 (see Appendix A). Figure 2 shows the existing peak hour intersection volumes.

AM **PM**

Figure 2. Existing Peak Hour Traffic Volumes.

Existing conditions were modeled using Synchro (see Appendix D). The results of the analysis are shown in Table 1. The results indicate that significant delay occurs for vehicles entering Lakemont Boulevard SE from Forest Drive SE. Traffic signal warrant analysis was conducted in accordance with MUTCD methodology for warrants 1 through 9 to determine if a signal is warranted based on existing conditions (see Appendix C). The results indicate that only warrant 3 (Peak Hour Volume) is met during the PM peak hour.

A field visit was conducted to observe existing conditions.

Table 1. Existing Conditions – Synchro Results.

Street	Movement	Existing Conditions (Current)			
		Delay(s)	LOS	Avg. Queue	95th Percentile Queue
AM Peak					
Forest Drive	EBL/R	60	F	-	122
Lakemont Blvd.	NBL/T	3	A	-	10
	SBT/R	0	A	-	0
	Intersection	**8**	**A**		
PM Peak					
Forest Drive	EBL/R	115	F	-	243
Lakemont Blvd.	NBL/T	2	A	-	5
	SBT/R	0	A	-	0
	Intersection	**17**	**C**		

Collision History

The City of Bellevue provided the raw crash data for the study location for the last five years (see Appendix B). The data were analyzed and post-processed, and crashes were grouped based on different crash types, as shown in Table 2. Seven collisions occurred at the intersection of Lakemont Boulevard SE and Forest Drive SE over the past five years. The majority of the collisions are rear-end crashes. Three of the rear-end collisions were in the northbound direction, and the other collision was in the eastbound direction. One of the northbound collisions involved a left-turn vehicle.

Table 2. Collision History.

	Crash Count
Approach Turn	0
Head On	1
Other	0
Parked Vehicle/Fixed Object	0
Pedestrian	0
Rear End	4
Right Angle	2
Sideswipe/Lane Change	0
Total	7

Public Outreach

An open house for the Lakemont Boulevard SE and Forest Drive SE intersection analysis was conducted on the evening of February 20, 2019. The open house was held at the Lewis Creek Park Visitor Center. Comments received included comment cards from open house participants and email correspondence for some community members that were unable to attend. The following list gives a summary of the comments received.

- An added left-turn lane for northbound Lakemont Boulevard SE to Forest Drive SE would be helpful.
- Adding a right-turn lane for Forest Drive SE would be beneficial.
- Some respondents did not like the idea of a traffic signal at the intersection, or did not see the need for it, adding that the interruption to traffic on Lakemont Boulevard SE would be undesirable.
- One commenter asked if bicycle volumes had been considered in the analysis.

Copies of the comments received are included in Appendix F.

TRAFFIC ANALYSIS

Modeling Methodology

AM and PM peak hour traffic analysis was conducted to evaluate operational improvements at the Lakemont Boulevard SE and Forest Drive SE intersection. The operation analysis covered Existing, Future No-Build, and Future Build conditions for the study area.

Synchro was used for the analysis (see Appendix D). The City of Bellevue provided the 2035 future volumes used in this analysis and shown in Table 3.

Traffic Volumes

Table 3. Intersection Volumes.

Location	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
AM Peak	110	-	20	-	-	-	120	540	-	-	200	170
	106	-	24	-	-	-	97	456	-	-	219	174
PM Peak	80	-	130	-	-	-	40	180	-	-	890	150
	78	-	88	-	-	-	36	198	-	-	841	172

Legend: 2035 Intersection Volumes
Existing Volumes

Alternatives Analysis

Three future scenarios were considered for the alternatives analysis. Table 4 summarizes the Synchro results for each scenario. Conceptual plans for the two build alternatives are shown on Figures 3 and 4.

- Future No Build: Maintain existing configuration and stop control.
- Build Alternative 1: Signalized intersection with permissive northbound left turns.
- Build Alternative 2: Signalized intersection with permissive northbound left turns and northbound left-turn lane.

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Figure 3 – Lakemont Blvd SE/Forest Drive SE – Alternative 1

Signal Control w/ Added Left-Turn Lane

Lakemont Blvd SE

Forest Dr SE

Right-of-Way

156th Ave SE

N

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Figure 4 – Lakemont Blvd SE/Forest Drive SE – Alternative 2

Table 4. 2035 Alternatives – Synchro Results.

Street	Movement	Future No-Build (No Change)				Build Alt. 1 (Signal)				Build Alt. 2 (Signal + LT Pocket)			
		Delay (s)	LOS	Avg. Queue	95th Percentile Queue	Delay (s)	LOS	Avg. Queue	95th Percentile Queue	Delay (s)	LOS	Avg. Queue	95th Percentile Queue
AM Peak													
Forest Dr.	EBL/R	114	F	-	175	23	C	43	77	18	B	29	77
Lakemont Blvd.	NBL	-	-	-	-	-	-	-	-	6	A	13	38
	NBT	3	A	-	12	14	B	156	293	9	A	98	198
	SBT/R	0	A	-	0	4	A	30	81	4	A	28	81
	Intersection	**14**	**B**			**12**	**B**			**8**	**A**		
PM Peak													
Forest Dr.	EBL/R	210	F	-	390	18	B	44	88	18	B	44	88
Lakemont Blvd.	NBL	-	-	-	-	-	-	-	-	8	A	4	16
	NBT	3	A	-	6	6	A	17	43	5	A	13	34
	SBT/R	0	A	-	0	14	B	136	317	14	B	136	317
	Intersection	**38**	**E**			**14**	**B**			**14**	**B**		

Several other factors have been considered in addition to the traffic operations at the intersection. Table 5 provides a summary of various criteria for each alternative. A preliminary Opinion of Probable Construction Costs for each alternative can be found in Appendix B.

Table 5. Alternatives Analysis.

Future No Build	Alternative 1	Alternative 2
Traffic Operations		
LOS E (LOS F for Forest Dr. approach) Forest Dr.: Excessive delays/queueing Lakemont: Minimal delays/queueing NB	LOS B (LOS C for Forest Dr. approach) Forest Dr.: Reduced delays/queueing Lakemont: Increased delays/queueing NB and SB	LOS B (LOS B for Forest Dr. approach) Forest Dr.: Reduced delays/queueing Lakemont: Delays/queueing improved NB in A.M. compared to Alt 1
Traffic Safety		
Increased challenges for drivers trying to enter Lakemont from Forest Dr.	Increased potential for rear-end collisions on Lakemont, Reduced potential for right-angle collisions	Increased potential for rear-end collisions on Lakemont but less so than Alt 1 Reduced potential for right-angle collisions
Right-of-Way		
None	None	Minor right-of-way needed to accommodate signal poles
Stormwater Impacts		
None	Minor increase in impervious surfacing, does not trigger stormwater mitigation.	Increase in impervious surfacing, triggers stormwater treatment and flow control

Table 5. Alternatives Analysis.

Future No Build	Alternative 1	Alternative 2
Environmental Impacts		
None	None	Stream buffer is impacted on west side of Lakemont.
Utility Impacts		
None	None	Utility poles need to be relocated to accommodate clear zone requirements
Construction Costs		
None	$1,065,000 (see Appendix E)	$1,685,000 (see Appendix E)
Other		
None	None	Steep slopes along Lakemont; retaining wall needed to keep improvements within right-of-way and minimize impacts to stream buffer.

Each alternative was also assessed to identify how it impacts the Multi-Modal LOS for pedestrians, bikes, and transit. Table 6 summarizes the assessment.

Table 6. Preferred Alternatives MMLOS Analysis (Lakemont/Newport Way)

Element	Alternative 1 – Signal Control	Alternative 2 – Signal Control with Left-turn Lane
Pedestrian LOS		
Sidewalk & Landscape Buffer	Improves: Sidewalk is added on the east side of the intersection.	Improves: Sidewalk is added on the east side of the intersection.
Intersection Treatment	Improves: Pedestrian signal is provided for all intersection crossings.	Improves: Pedestrian signal is provided for all intersection crossings.
Bicycle LOS		
Intersection Treatment	No change	Improves: Bike lane buffer is added on north and south legs of intersection.
Transit LOS		
Passenger Amenities	No change	No change
Transit Speed	Improves	Improves

Recommended Alternative

Alternative 2 with a northbound left-turn pocket at the intersection of Lakemont Boulevard SE and Forest Drive SE is the preferred alternative. This alternative is further described below and shown in Appendix B.

Anticipated Benefits

The primary benefit of the future signalized alternatives is the reduced delays for vehicles trying to access Lakemont Boulevard SE from Forest Drive SE. Both alternatives provide significant improvement for the west leg of the intersection. Alternative 2 provides the best overall traffic operations of any of the alternatives. The average intersection delay of 14.0 seconds/vehicle in the PM peak hour of the design year is markedly better than the 38.0 seconds/vehicle delay of the projected No-Build alternative. In addition, the construction of the left-turn pocket improves the operations for northbound travelers on Lakemont Boulevard SE, particularly in the AM peak hour, by eliminating potential blockage of northbound through vehicles and reducing the potential for rear end collisions when left-turning vehicles slow to make a northbound left turn.

The signalized intersection also provides a protected crossing for pedestrians crossing Lakemont Boulevard SE.

Challenges and Risks

Though Alternative 2 is an improvement to the overall intersection operation and LOS, the addition of a traffic signal does adversely affect the traffic on Lakemont Boulevard SE. The previously uncontrolled movements would be stopped to allow traffic from Forest Drive SE on to Lakemont Boulevard SE. The projected delays provide adequate LOS but are a changed condition from what drivers currently experience.

In general, signalizing an intersection approach that currently does not have to stop could increase the potential for rear-end collisions; however, the potential for right-angle (or T-bone) collisions involving people turning out of the side street, which are typically more severe, is reduced.

It is assumed that the proposed alternative can be constructed without significant environmental impacts; however, there will likely be some impact to stream buffers on the west side of Lakemont Boulevard SE. Further critical area assessment is needed to identify stream buffer boundaries and confirm the level of impact.

Opinion of Probable Construction Costs

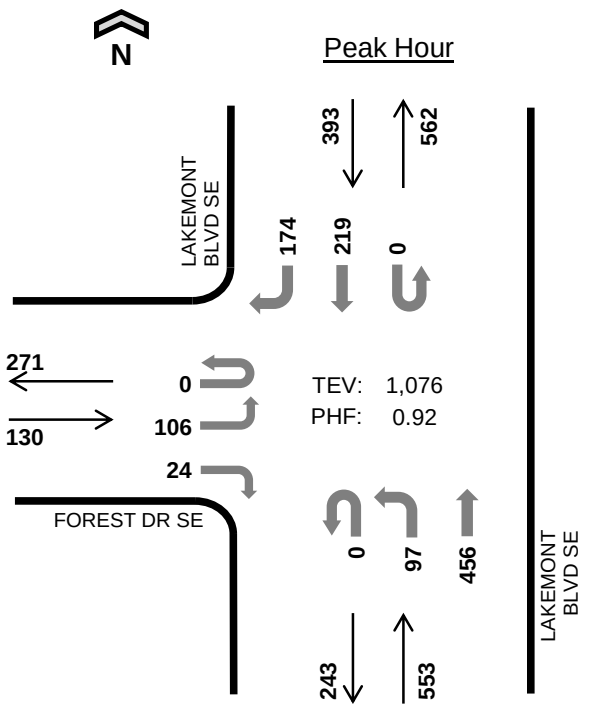
The preliminary opinion of probable construction costs for the preferred alternative is $1,685,000. This estimate includes construction costs only and does not account for any right-of-way costs that may be needed to accommodate signal poles or any environmental impact mitigation.

The primary difference in cost between the preferred alternative (Alternative 2) and Alternative 1 is the added cost for the expanded roadway prism to accommodate the northbound left-turn lane. It is assumed that a retaining wall will be needed along the east side of the roadway due to the existing steep slopes adjacent to the road.

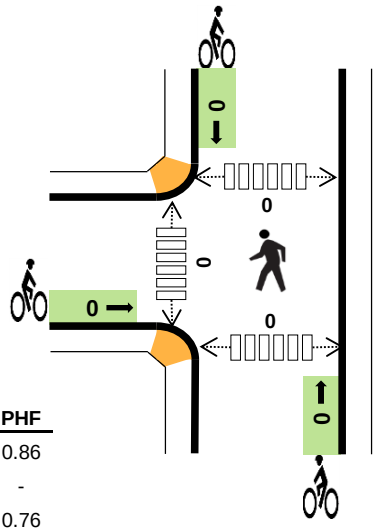
APPENDICES

APPENDIX A: TRAFFIC COUNTS

LAKEMONT BLVD SE
FOREST DR SE



Date: Tue, Nov 13, 2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM



	HV %:	PHF
EB	1.5%	0.86
WB	-	-
NB	1.4%	0.76
SB	2.0%	0.85
TOTAL	1.7%	0.92

Two-Hour Count Summaries

Interval Start	FOREST DR SE				0				LAKEMONT BLVD SE				LAKEMONT BLVD SE				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	12	0	7	0	0	0	0	0	4	79	0	0	0	36	25	163	0
7:15 AM	0	20	0	7	0	0	0	0	0	15	68	0	0	0	48	23	181	0
7:30 AM	0	14	0	9	0	0	0	0	0	22	98	0	0	0	46	38	227	0
7:45 AM	**0**	**23**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**22**	**125**	**0**	**0**	**0**	**63**	**32**	**274**	845
8:00 AM	**0**	**28**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**49**	**134**	**0**	**0**	**0**	**48**	**29**	**292**	974
8:15 AM	**0**	**33**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**18**	**113**	**0**	**0**	**0**	**51**	**54**	**274**	1,067
8:30 AM	**0**	**22**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**8**	**84**	**0**	**0**	**0**	**57**	**59**	**236**	**1,076**
8:45 AM	0	20	0	17	0	0	0	0	0	10	90	0	0	0	55	30	222	1,024
Count Total	0	172	0	64	0	0	0	0	0	148	791	0	0	0	404	290	1,869	0
Peak Hour	**0**	**106**	**0**	**24**	**0**	**0**	**0**	**0**	**0**	**97**	**456**	**0**	**0**	**0**	**219**	**174**	**1,076**	**0**

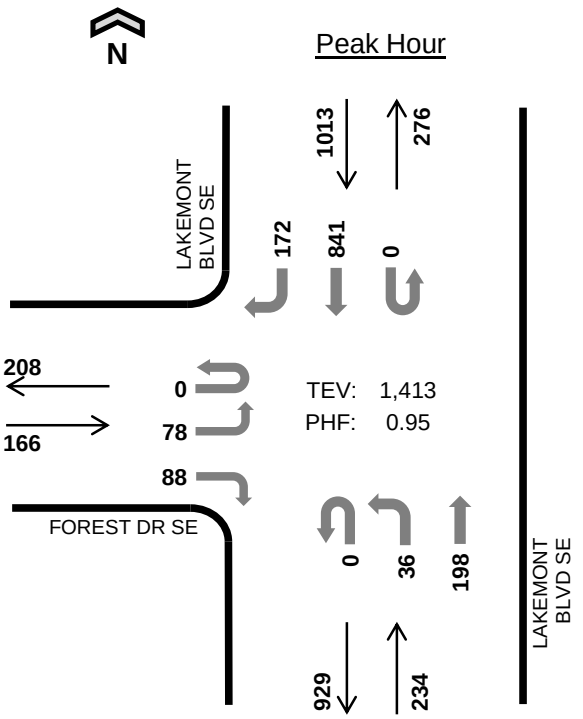
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

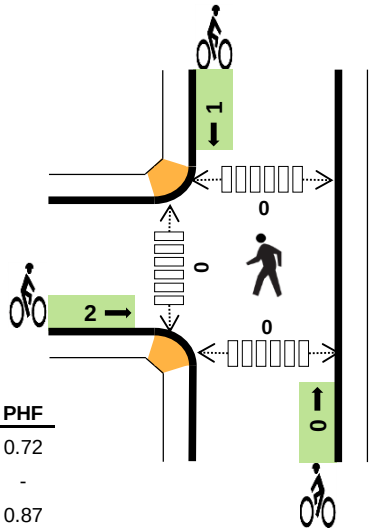
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	0	0	4	*5*	1	0	1	0	*2*	0	0	0	0	*0*
7:15 AM	1	0	3	3	*7*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	**0**	**0**	**2**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**1**	**0**	**3**	**1**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**1**	**0**	**2**	**1**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:30 AM	**0**	**0**	**1**	**5**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:45 AM	0	0	3	2	*5*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	4	0	15	17	*36*	1	0	1	0	*2*	0	0	0	0	*0*
Peak Hr	**2**	**0**	**8**	**8**	***18***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

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

LAKEMONT BLVD SE
FOREST DR SE

Date: Tue, Nov 13, 2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM





	HV %:	PHF
EB	1.2%	0.72
WB	-	-
NB	1.3%	0.87
SB	1.1%	0.95
TOTAL	1.1%	0.95

Two-Hour Count Summaries

Interval Start	FOREST DR SE				0				LAKEMONT BLVD SE				LAKEMONT BLVD SE				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	24	0	11	0	0	0	0	0	5	66	0	0	0	164	40	310	0
4:15 PM	0	26	0	18	0	0	0	0	0	6	48	0	0	0	189	33	320	0
4:30 PM	0	24	0	14	0	0	0	0	0	9	48	0	0	0	220	35	350	0
4:45 PM	**0**	**12**	**0**	**20**	**0**	**0**	**0**	**0**	**0**	**12**	**55**	**0**	**0**	**0**	**196**	**29**	**324**	1,304
5:00 PM	**0**	**17**	**0**	**15**	**0**	**0**	**0**	**0**	**0**	**4**	**61**	**0**	**0**	**0**	**217**	**50**	**364**	1,358
5:15 PM	**0**	**20**	**0**	**24**	**0**	**0**	**0**	**0**	**0**	**13**	**40**	**0**	**0**	**0**	**207**	**51**	**355**	1,393
5:30 PM	**0**	**29**	**0**	**29**	**0**	**0**	**0**	**0**	**0**	**7**	**42**	**0**	**0**	**0**	**221**	**42**	**370**	**1,413**
5:45 PM	0	21	0	13	0	0	0	0	0	16	44	0	0	0	180	29	303	1,392
Count Total	0	173	0	144	0	0	0	0	0	72	404	0	0	0	1,594	309	2,696	0
Peak Hour	**0**	**78**	**0**	**88**	**0**	**0**	**0**	**0**	**0**	**36**	**198**	**0**	**0**	**0**	**841**	**172**	**1,413**	**0**

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	2	0	2	4	*8*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	0	0	3	1	*4*	0	0	0	0	*0*	0	0	0	0	*0*
4:45 PM	**0**	**0**	**1**	**4**	***5***	**1**	**0**	**0**	**1**	***2***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**1**	**0**	**0**	**4**	***5***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
5:15 PM	**1**	**0**	**2**	**1**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:30 PM	**0**	**0**	**0**	**2**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:45 PM	0	0	0	3	*3*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	4	0	9	19	*32*	2	0	0	1	*3*	0	0	0	0	*0*
Peak Hr	**2**	**0**	**3**	**11**	***16***	**2**	**0**	**0**	**1**	***3***	**0**	**0**	**0**	**0**	***0***

APPENDIX B: COLLISION DATA

Date	Year	ColTypeDesc	PossInjuries	NDInjuries	DInjuries	Fatalities	Injury	RoadSurfaceDesc	LightCondDesc	VehDirLong	VehMovement	StreetName	CrossStreetName	Contrib1CircumDesc	Contrib2CircumDesc	Contrib3CircumDesc
11/17/2017 22:50	2017	Rear End	0	0	0	0	PDO	dry	Dark - Street Lights On	Eastbound	T	FOREST DR SE	LAKEMONT BD SE	Inattention		
11/17/2017 22:50	2017	Rear End	0	0	0	0	PDO	dry	Dark - Street Lights On	Eastbound	T	FOREST DR SE	LAKEMONT BD SE	None		
3/11/2016 18:32	2016	Rear End	1	0	0	0	Possible Injury	wet	Dark - Street Lights On	Northbound	T	FOREST DR SE	LAKEMONT BD SE	Unknown driver distraction		
3/11/2016 18:32	2016	Rear End	1	0	0	0	Possible Injury	wet	Dark - Street Lights On	Northbound	T	FOREST DR SE	LAKEMONT BD SE	None		
1/16/2016 9:09	2016	Head On	2	0	0	0	Possible Injury	wet	Daylight	Northbound	T	FOREST DR SE	LAKEMONT BD SE	Exceeding Reasonable Safe Speed		
1/16/2016 9:09	2016	Head On	2	0	0	0	Possible Injury	wet	Daylight	Southbound	T	FOREST DR SE	LAKEMONT BD SE	None		
10/16/2015 15:43	2015	Rear End	0	0	0	0	PDO	dry	Daylight	Northbound	T	FOREST DR SE	LAKEMONT BD SE	Inattention	Exceeding Reasonable Safe Speed	
10/16/2015 15:43	2015	Rear End	0	0	0	0	PDO	dry	Daylight	Northbound	T	FOREST DR SE	LAKEMONT BD SE	Failing to Signal		
9/29/2013 12:55	2013	Right Angle	1	0	0	0	Possible Injury	wet	Daylight	Westbound	T	FOREST DR SE	LAKEMONT BD SE	Other * (List in Narrative)	Inattention	Did Not Grant R/W to Vehicle
9/29/2013 12:55	2013	Right Angle	1	0	0	0	Possible Injury	wet	Daylight	Southbound	T	FOREST DR SE	LAKEMONT BD SE	None		
6/27/2013 19:04	2013	Rear End	1	0	0	0	Possible Injury	dry	Daylight	Northbound	T	FOREST DR SE	LAKEMONT BD SE	Exceeding Reasonable Safe Speed	Driver adjusting audio or entertnmt system	
6/27/2013 19:04	2013	Rear End	1	0	0	0	Possible Injury	dry	Daylight	Northbound	T	FOREST DR SE	LAKEMONT BD SE	None		
4/10/2013 17:02	2013	Right Angle	0	0	0	0	PDO	dry	Daylight	Northbound	T	FOREST DR SE	LAKEMONT BD SE	Other * (List in Narrative)		
4/10/2013 17:02	2013	Right Angle	0	0	0	0	PDO	dry	Daylight	Eastbound	T	FOREST DR SE	LAKEMONT BD SE	Other * (List in Narrative)		

APPENDIX C: TRAFFIC SIGNAL WARRANT ANALYSIS

Bellevue TO 2 Corridor Improvements
Traffic Signal Warrant Analysis
Lakemont Blvd SE & Forest Dr SE
Warrant Analysis Summary

Warrant Number and Description	Warrant Met?
Warrant 1: 8-Hour Volume	No
Warrant 2: 4-Hour Volume	No
Warrant 3: Peak Hour Volume	**Yes**
Warrant 4: Pedestrian Volume	No
Warrant 5: School Crossing	No
Warrant 6: Coordinated Signal	No
Warrant 7: Crash Experience	No
Warrant 8: Roadway Network	No
Warrant 9: Near Grade Crossing	No

As shown in this warrant analysis, a signal is warranted during the PM peak hour due to high existing traffic volumes. All other warrants are not met, or are not applicable to this intersection.

Bellevue TO 2 Corridor Improvements
Traffic Signal Warrant Analysis
Lakemont Blvd SE & Forest Dr SE
Warrant 1: 8-Hour Volume

Existing Volumes

One Lane and One Lane

Hour	Vehicles per hour on major street (total of both approaches)	Vehicles per hour on Minor Street (One Direction Only)	Warrant		
	Lakemont Blvd SE	Forest Dr SE	Condition A	Condition B	Combination A & B
12:00 AM	10	8	No	No	No
01:00 AM	7	3	No	No	No
02:00 AM	4	2	No	No	No
03:00 AM	9	1	No	No	No
04:00 AM	21	5	No	No	No
05:00 AM	83	15	No	No	No
06:00 AM	257	38	No	No	No
07:00 AM	711	94	No	No	No
08:00 AM	882	118	No	Yes	No
09:00 AM	597	106	No	No	No
10:00 AM	421	82	No	No	No
11:00 AM	404	83	No	No	No
12:00 PM	436	96	No	No	No
01:00 PM	450	85	No	No	No
02:00 PM	514	100	No	No	No
03:00 PM	839	143	No	Yes	Yes
04:00 PM	1,171	140	No	Yes	Yes
05:00 PM	1,204	127	No	Yes	Yes
06:00 PM	834	124	No	Yes	Yes
07:00 PM	381	92	No	No	No
08:00 PM	234	73	No	No	No
09:00 PM	179	54	No	No	No
10:00 PM	82	26	No	No	No
11:00 PM	35	11	No	No	No
Number of Hours Warranted			**0**	**5**	**4**

This warrant tests to determine if volumes exceed the signal warrant threshold for 8 hours over the course of 24 consecutive hours. As shown, 0 hours are met under Condition A, 5 hours are met under Condition B, and 4 hours are met under Combination A & B. Therefore, this warrant is not met.

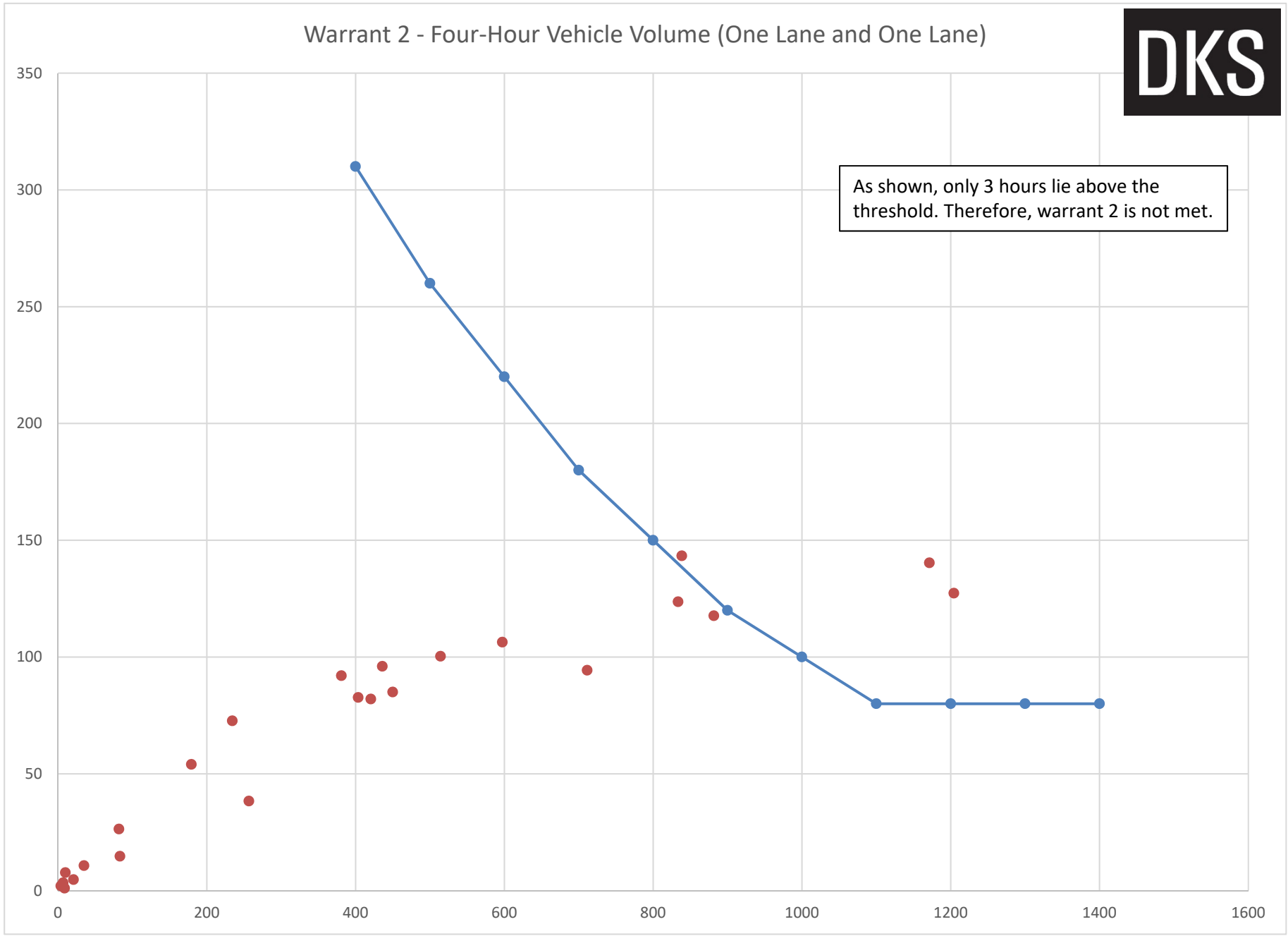
Bellevue TO 2 Corridor Improvements
Traffic Signal Warrant Analysis
Lakemont Blvd SE & Forest Dr SE
Warrant 2: 4-Hour Volume

Existing Volumes

One Lane and One Lane

Hour	Vehicles per hour on major street (total of both approaches)	Vehicles per hour on Minor Street (One Direction Only)	Warrant
	Lakemont Blvd SE	Forest Dr SE	
12:00 AM	10	8	No
01:00 AM	7	3	No
02:00 AM	4	2	No
03:00 AM	9	1	No
04:00 AM	21	5	No
05:00 AM	83	15	No
06:00 AM	257	38	No
07:00 AM	711	94	No
08:00 AM	882	118	No
09:00 AM	597	106	No
10:00 AM	421	82	No
11:00 AM	404	83	No
12:00 PM	436	96	No
01:00 PM	450	85	No
02:00 PM	514	100	No
03:00 PM	839	143	Yes
04:00 PM	1,171	140	Yes
05:00 PM	1,204	127	Yes
06:00 PM	834	124	No
07:00 PM	381	92	No
08:00 PM	234	73	No
09:00 PM	179	54	No
10:00 PM	82	26	No
11:00 PM	35	11	No
Number of Hours Warranted			**3**

This warrant tests to see if traffic volumes exceed the signal warrant threshold for 4 hours over the course of 24 consecutive hours. As shown, 3 hours meet the threshold. Therefore, this warrant is not met.


Warrant 2 - Four-Hour Vehicle Volume (One Lane and One Lane)
DKS
As shown, only 3 hours lie above the threshold. Therefore, warrant 2 is not met.
350
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
1400
1600

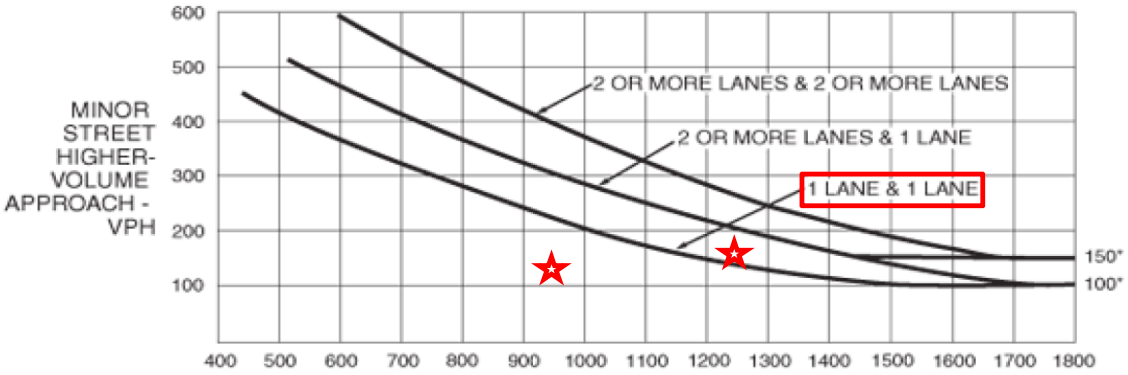
Bellevue TO 2 Corridor Improvements
Traffic Signal Warrant Analysis
Lakemont Blvd SE & Forest Dr SE
Warrant 3: Peak Hour Volume

One Lane and One Lane

Hour	Vehicles per hour on major street (total of both approaches)	Vehicles per hour on Minor Street (One Direction Only)	Warrant
	Lakemont Blvd SE	Forest Dr SE	
AM Peak Hour Vol.	946	130	No
PM Peak Hour Vol.	1247	166	Yes

2009 Edition Part 4 Figure 4C-3. Warrant 3, Peak Hour

Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Table for Figure 4C-3

One lane and one lane		Two or more lanes and one lane		Two or more lanes and two or more lanes	
VPH on the major street (Total of both approaches)	VPH on the minor street (Higher volume approach)	VPH on the major street (Total of both approaches)	VPH on the minor street (Higher volume approach)	VPH on the major street (Total of both approaches)	VPH on the minor street (Higher volume approach)
1800	100	1800	100 or 150*	1800	150
1700	100	1700	100 or 150*	1700	150
1600	100	1600	120 or 150*	1600	170
1500	100	1500	145 or 150*	1500	180
1400	120	1400	155	1400	220
1300	130	1300	190	1300	250
1200	150	1200	220	1200	285
1100	175	1100	250	1100	340
1000	200	1000	285	1000	370
900	245	900	325	900	425
800	285	800	360	800	475
700	325	700	420	700	540
600	360	600	460	600	590
500	420	500	Not available	500	Not available

* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

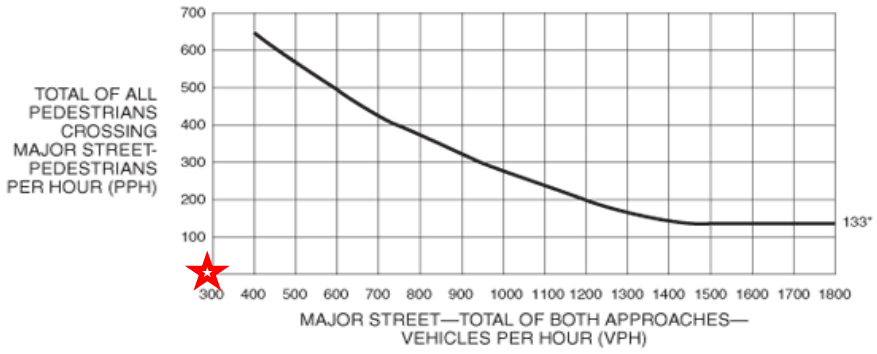
This warrant tests if the peak hour volumes are high enough to meet the signal warrant threshold. As shown, the PM peak hour volumes meet the signal warrant threshold. Therefore, warrant 3 is met.

Bellevue TO 2 Corridor Improvements
Traffic Signal Warrant Analysis
Lakemont Blvd SE & Forest Dr SE
Warrant 4: Pedestrian Volume

Hour	Vehicles per hour on major street (total of both approaches)	Total Pedestrians Crossing Major Street (pedestrians per hour)	Warrant
	Lakemont Blvd SE		
AM Peak Hour Vol.	0	0	No
PM Peak Hour Vol.	0	0	No

2009 Edition Part 4 Figure 4C-7. Warrant 4, Pedestrian Peak Hour

Figure 4C-7. Warrant 4, Pedestrian Peak Hour



*Note: 133 pph applies as the lower threshold volume.

Table for Figure 4C-7

Pedestrian Four-Hour Volume	
VPH on the major street (Total of both approaches)	PPH for the total of all pedestrians crossing the major street
1800	133*
1700	133*
1600	133*
1500	133*
1400	150
1300	175
1200	200
1100	225
1000	280
900	325
800	375
700	420
600	500
500	575
400	650

* Note: 133 pph applies as the lower threshold volume.

This warrant tests if a signal is warranted by pedestrian volumes during a peak hour. As shown, both peak hour pedestrian volumes are zero. Therefore, warrant 4 is not met.

Bellevue TO 2 Corridor Improvements
Traffic Signal Warrant Analysis
Lakemont Blvd SE & Forest Dr SE

Warrant 5: School Crossing

The intersection of Lakemont Boulevard & Forest Drive SE is more than 1 mile from the nearest school. Therefore, there isn't a high volume of schoolchildren using the crosswalks and Warrant 5 is not met.

Warrant 6: Coordinated Signal

Traffic analysis shows that there is adequate platooning of vehicles on both Lakemont Boulevard SE due to the signal to the north at Lakemont Boulevard SE & SE 63rd Street/SE Cougar Mountain Way. Therefore, Warrant 6 is not met.

Warrant 7: Crash Experience

Historical crash analysis reveals 7 crashes near the intersection of Lakemont Boulevard SE & Forest Drive SE from the period of 2012 through 2017 as reported by the City of Bellevue, but there was no 12-month period where more than 5 collisions occurred. Therefore, Warrant 7 is not met.

Warrant 8: Roadway Network

The intersection of Lakemont Boulevard SE & Forest Drive SE does not lie on a major route or highway system serving as the principal roadway network for through traffic. Therefore, Warrant 8 is not met.

Warrant 9: Near Grade Crossing

There are no railroad crossings within at least 2,000 feet on either Lakemont Boulevard SE or Forest Drive SE. Therefore, Warrant 9 is not met.

Bellevue TO 2 Corridor Improvements
Traffic Signal Warrant Analysis
Lakemont Blvd SE & Forest Dr SE

DKS

Location 1: Lakemont Blvd SE N/O Forest Dr SE

	Tuesday, November 13, 2018			Wednesday, November 14, 2018			Thursday, November 15, 2018			Average Volume		
Time	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
12:00 AM	11	5	16	11	7	18	12	7	19	11	6	18
01:00 AM	3	3	6	6	1	7	7	10	17	5	5	10
02:00 AM	1	0	1	6	2	8	3	5	8	3	2	6
03:00 AM	3	7	10	3	3	6	4	9	13	3	6	10
04:00 AM	13	14	27	5	16	21	11	11	22	10	14	23
05:00 AM	38	59	97	31	39	70	27	70	97	32	56	88
06:00 AM	158	106	264	154	121	275	147	114	261	153	114	267
07:00 AM	441	310	751	433	257	690	422	288	710	432	285	717
08:00 AM	530	373	903	511	361	872	516	381	897	519	372	891
09:00 AM	306	329	635	355	316	671	317	293	610	326	313	639
10:00 AM	219	220	439	227	242	469	236	202	438	227	221	449
11:00 AM	219	253	472	199	223	422	193	222	415	204	233	436
12:00 PM	219	250	469	220	270	490	223	273	496	221	264	485
01:00 PM	197	248	445	251	306	557	215	258	473	221	271	492
02:00 PM	231	337	568	217	315	532	205	358	563	218	337	554
03:00 PM	286	572	858	288	634	922	290	640	930	288	615	903
04:00 PM	309	900	1,209	285	907	1,192	264	1009	1,273	286	939	1225
05:00 PM	266	999	1,265	299	947	1,246	286	968	1,254	284	971	1255
06:00 PM	256	650	906	248	600	848	217	674	891	240	641	882
07:00 PM	204	253	457	174	208	382	178	291	469	185	251	436
08:00 PM	144	136	280	138	159	297	134	122	256	139	139	278
09:00 PM	112	88	200	123	113	236	116	87	203	117	96	213
10:00 PM	48	39	87	54	39	93	63	43	106	55	40	95
11:00 PM	19	19	38	21	26	47	24	21	45	21	22	43
Total	**4233**	**6170**	**10403**	**4259**	**6112**	**10371**	**4110**	**6356**	**10466**	**4201**	**6213**	**10413**

DKS

Location 2: Lakemont Blvd SE S/O Forest Dr SE

	Tuesday, November 13, 2018			Wednesday, November 14, 2018			Thursday, November 15, 2018			Average Volume		
Time	**NB**	**SB**	**Total**	**NB**	**SB**	**Total**	**NB**	**SB**	**Total**	**NB**	**SB**	**Total**
12:00 AM	4	2	6	2	3	5	5	5	10	4	3	7
01:00 AM	3	3	6	1	0	1	3	9	12	2	4	6
02:00 AM	1	0	1	3	1	4	1	3	4	2	1	3
03:00 AM	2	0	2	3	1	4	3	3	6	3	1	4
04:00 AM	9	11	20	5	9	14	8	8	16	7	9	17
05:00 AM	33	47	80	25	26	51	24	52	76	27	42	69
06:00 AM	148	63	211	141	87	228	140	79	219	143	76	219
07:00 AM	433	231	664	432	205	637	414	217	631	426	218	644
08:00 AM	506	245	751	518	255	773	506	268	774	510	256	766
09:00 AM	286	248	534	298	234	532	270	235	505	285	239	524
10:00 AM	197	172	369	199	171	370	202	165	367	199	169	369
11:00 AM	193	201	394	159	185	344	161	180	341	171	189	360
12:00 PM	175	212	387	159	204	363	181	202	383	172	206	378
01:00 PM	156	203	359	190	232	422	192	200	392	179	212	391
02:00 PM	191	290	481	160	270	430	182	301	483	178	287	465
03:00 PM	220	499	719	225	555	780	225	561	786	223	538	762
04:00 PM	245	844	1,089	239	830	1,069	214	943	1,157	233	872	1105
05:00 PM	227	912	1,139	249	882	1,131	223	889	1,112	233	894	1127
06:00 PM	198	598	796	203	532	735	176	602	778	192	577	770
07:00 PM	142	202	344	125	166	291	124	247	371	130	205	335
08:00 PM	105	108	213	93	128	221	88	95	183	95	110	206
09:00 PM	83	61	144	86	90	176	81	60	141	83	70	154
10:00 PM	46	31	77	33	33	66	46	36	82	42	33	75
11:00 PM	15	14	29	10	17	27	14	16	30	13	16	29
Total	**3618**	**5197**	**8815**	**3558**	**5116**	**8674**	**3483**	**5376**	**8859**	**3553**	**5230**	**8783**

DKS

Location 3: Forest Dr SE W/O Lakemont Blvd SE

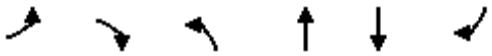
	Tuesday, November 13, 2018			Wednesday, November 14, 2018			Thursday, November 15, 2018			Average Volume		
Time	**EB**	**WB**	**Total**	**EB**	**WB**	**Total**	**EB**	**WB**	**Total**	**EB**	**WB**	**Total**
12:00 AM	7	3	10	9	4	13	7	2	9	8	3	11
01:00 AM	0	0	0	5	1	6	5	2	7	3	1	4
02:00 AM	0	0	0	4	2	6	2	2	4	2	1	3
03:00 AM	1	6	7	1	3	4	1	7	8	1	5	6
04:00 AM	7	7	14	2	8	10	5	6	11	5	7	12
05:00 AM	18	25	43	11	19	30	15	30	45	15	25	39
06:00 AM	40	85	125	42	59	101	33	73	106	38	72	111
07:00 AM	102	190	292	78	140	218	103	166	269	94	165	260
08:00 AM	130	280	410	110	274	384	113	245	358	118	266	384
09:00 AM	90	180	270	115	173	288	114	136	250	106	163	269
10:00 AM	83	126	209	74	110	184	89	107	196	82	114	196
11:00 AM	82	104	186	93	94	187	73	81	154	83	93	176
12:00 PM	101	103	204	93	112	205	94	128	222	96	114	210
01:00 PM	89	94	183	101	119	220	65	110	175	85	108	193
02:00 PM	95	111	206	104	86	190	102	125	227	100	107	208
03:00 PM	142	154	296	144	163	307	144	164	308	143	160	304
04:00 PM	137	164	301	133	168	301	151	176	327	140	169	310
05:00 PM	133	200	333	118	171	289	131	166	297	127	179	306
06:00 PM	134	151	285	116	150	266	121	146	267	124	149	273
07:00 PM	104	107	211	86	85	171	86	87	173	92	93	185
08:00 PM	69	65	134	76	63	139	73	56	129	73	61	134
09:00 PM	47	54	101	60	54	114	55	47	102	54	52	106
10:00 PM	20	31	51	31	18	49	28	20	48	26	23	49
11:00 PM	8	11	19	13	12	25	11	6	17	11	10	20
Total	**1639**	**2251**	**3890**	**1619**	**2088**	**3707**	**1621**	**2088**	**3709**	**1626**	**2142**	**3769**

Bellevue TO 2 Corridor Improvements
Traffic Signal Warrant Analysis
Lakemont Blvd SE & Forest Dr SE

DKS

Lakemont Blvd SE & Forest Dr SE - Tuesday, November 13, 2018																									
Vehicle Movements																									
AM													PM												
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
106	0	24	0	0	0	97	456	0	0	219	174		78	0	88	0	0	0	36	198	0	0	841	172	
Pedestrians Crossing																									
AM													PM												
South Leg			North Leg			East Leg			West Leg				South Leg			North Leg			East Leg			West Leg			
0			0			0			0				0			0			0			0			

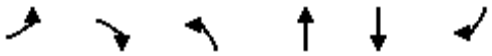
APPENDIX D: TRAFFIC ANALYSIS



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	106	24	97	456	219	174
Future Volume (Veh/h)	106	24	97	456	219	174
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.76	0.76	0.85	0.85
Hourly flow rate (vph)	123	28	128	600	258	205
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1166	
pX, platoon unblocked						
vC, conflicting volume	1216	360	463			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1216	360	463			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	30	96	88			
cM capacity (veh/h)	177	684	1104			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	151	728	463
Volume Left	123	128	0
Volume Right	28	0	205
cSH	205	1104	1700
Volume to Capacity	0.74	0.12	0.27
Queue Length 95th (ft)	122	10	0
Control Delay (s)	60.0	2.8	0.0
Lane LOS	F	A	
Approach Delay (s)	60.0	2.8	0.0
Approach LOS	F		

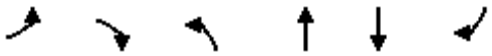
Intersection Summary			
Average Delay	8.3		
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	78	88	36	198	841	172
Future Volume (Veh/h)	78	88	36	198	841	172
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.72	0.87	0.87	0.95	0.95
Hourly flow rate (vph)	108	122	41	228	885	181
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1166	
pX, platoon unblocked						
vC, conflicting volume	1286	976	1066			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1286	976	1066			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	37	60	94			
cM capacity (veh/h)	171	306	657			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	230	269	1066
Volume Left	108	41	0
Volume Right	122	0	181
cSH	223	657	1700
Volume to Capacity	1.03	0.06	0.63
Queue Length 95th (ft)	243	5	0
Control Delay (s)	114.5	2.3	0.0
Lane LOS	F	A	
Approach Delay (s)	114.5	2.3	0.0
Approach LOS	F		

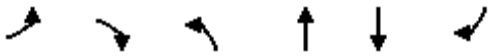
Intersection Summary			
Average Delay	17.2		
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	78	88	36	198	841	172
Future Volume (Veh/h)	78	88	36	198	841	172
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.72	0.87	0.87	0.95	0.95
Hourly flow rate (vph)	108	122	41	228	885	181
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1166	
pX, platoon unblocked						
vC, conflicting volume	1286	976	1066			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1286	976	1066			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	37	60	94			
cM capacity (veh/h)	171	306	657			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	230	269	1066
Volume Left	108	41	0
Volume Right	122	0	181
cSH	223	657	1700
Volume to Capacity	1.03	0.06	0.63
Queue Length 95th (ft)	243	5	0
Control Delay (s)	114.5	2.3	0.0
Lane LOS	F	A	
Approach Delay (s)	114.5	2.3	0.0
Approach LOS	F		

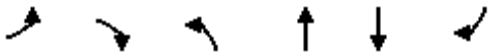
Intersection Summary			
Average Delay	17.2		
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	20	120	540	200	170
Future Volume (Veh/h)	110	20	120	540	200	170
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.76	0.76	0.85	0.85
Hourly flow rate (vph)	128	23	158	711	235	200
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1166	
pX, platoon unblocked						
vC, conflicting volume	1362	335	435			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1362	335	435			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	9	97	86			
cM capacity (veh/h)	140	707	1130			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	151	869	435
Volume Left	128	158	0
Volume Right	23	0	200
cSH	160	1130	1700
Volume to Capacity	0.94	0.14	0.26
Queue Length 95th (ft)	175	12	0
Control Delay (s)	113.7	3.3	0.0
Lane LOS	F	A	
Approach Delay (s)	113.7	3.3	0.0
Approach LOS	F		

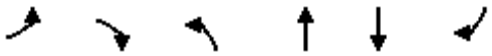
Intersection Summary			
Average Delay	13.8		
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	80	130	40	180	890	150
Future Volume (Veh/h)	80	130	40	180	890	150
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.72	0.87	0.87	0.95	0.95
Hourly flow rate (vph)	111	181	46	207	937	158
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1166	
pX, platoon unblocked						
vC, conflicting volume	1315	1016	1095			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1315	1016	1095			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	32	38	93			
cM capacity (veh/h)	163	290	641			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	292	253	1095
Volume Left	111	46	0
Volume Right	181	0	158
cSH	223	641	1700
Volume to Capacity	1.31	0.07	0.64
Queue Length 95th (ft)	390	6	0
Control Delay (s)	209.5	2.7	0.0
Lane LOS	F	A	
Approach Delay (s)	209.5	2.7	0.0
Approach LOS	F		

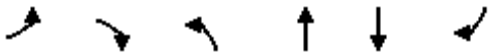
Intersection Summary			
Average Delay	37.7		
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		



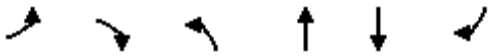
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	80	130	40	180	890	150
Future Volume (Veh/h)	80	130	40	180	890	150
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.72	0.87	0.87	0.95	0.95
Hourly flow rate (vph)	111	181	46	207	937	158
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1166	
pX, platoon unblocked						
vC, conflicting volume	1315	1016	1095			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1315	1016	1095			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	32	38	93			
cM capacity (veh/h)	163	290	641			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	292	253	1095
Volume Left	111	46	0
Volume Right	181	0	158
cSH	223	641	1700
Volume to Capacity	1.31	0.07	0.64
Queue Length 95th (ft)	390	6	0
Control Delay (s)	209.5	2.7	0.0
Lane LOS	F	A	
Approach Delay (s)	209.5	2.7	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	37.7		
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		



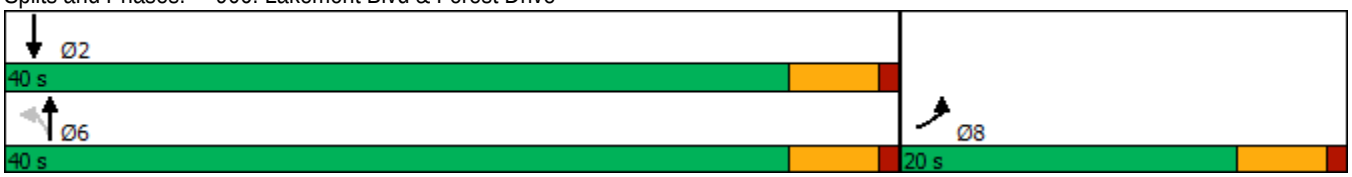
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	110	20	120	540	200	170
Future Volume (vph)	110	20	120	540	200	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.979				0.938	
Flt Protected	0.959			0.991		
Satd. Flow (prot)	1749	0	0	1864	1747	0
Flt Permitted	0.959			0.846		
Satd. Flow (perm)	1749	0	0	1591	1747	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	15				128	
Link Speed (mph)	30			30	30	
Link Distance (ft)	2425			3113	1166	
Travel Time (s)	55.1			70.8	26.5	
Peak Hour Factor	0.86	0.86	0.76	0.76	0.85	0.85
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%
Adj. Flow (vph)	128	23	158	711	235	200
Shared Lane Traffic (%)						
Lane Group Flow (vph)	151	0	0	869	435	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	10			10	10	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	2		2	2	2	
Detector Template						
Leading Detector (ft)	100		100	100	100	
Trailing Detector (ft)	2		2	2	2	
Detector 1 Position(ft)	2		2	2	2	
Detector 1 Size(ft)	6		6	6	6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	
Detector 2 Position(ft)	94		94	94	94	
Detector 2 Size(ft)	6		6	6	6	
Detector 2 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)	0.0		0.0	0.0	0.0	
Turn Type	Prot		Perm	NA	NA	
Protected Phases	8			6	2	
Permitted Phases			6			
Detector Phase	8		6	6	2	
Switch Phase						

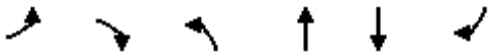


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	5.0		5.0	5.0	5.0	
Minimum Split (s)	20.0		20.0	20.0	20.0	
Total Split (s)	20.0		40.0	40.0	40.0	
Total Split (%)	33.3%		66.7%	66.7%	66.7%	
Maximum Green (s)	15.0		35.0	35.0	35.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	1.0		1.0	1.0	1.0	
Lost Time Adjust (s)	-1.0			-1.0	-1.0	
Total Lost Time (s)	4.0			4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Minimum Gap (s)	2.0		2.0	2.0	2.0	
Time Before Reduce (s)	0.0		0.0	0.0	0.0	
Time To Reduce (s)	5.0		5.0	5.0	5.0	
Recall Mode	None		Min	Min	Min	
Walk Time (s)	5.0		5.0	5.0	5.0	
Flash Dont Walk (s)	10.0		10.0	10.0	10.0	
Pedestrian Calls (#/hr)	10		10	10	10	
Act Effct Green (s)	10.2			39.4	39.4	
Actuated g/C Ratio	0.19			0.73	0.73	
v/c Ratio	0.44			0.74	0.33	
Control Delay	22.6			13.9	3.9	
Queue Delay	0.0			0.0	0.0	
Total Delay	22.6			13.9	3.9	
LOS	C			B	A	
Approach Delay	22.6			13.9	3.9	
Approach LOS	C			B	A	

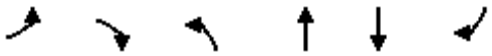
Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 53.7			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 11.8		Intersection LOS: B	
Intersection Capacity Utilization 73.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 906: Lakemont Blvd & Forest Drive





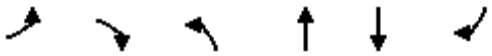
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	90	150	30	110	680	110
Future Volume (vph)	90	150	30	110	680	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99				1.00	
Frt	0.916				0.981	
Flt Protected	0.982			0.989		
Satd. Flow (prot)	1668	0	0	1860	1840	0
Flt Permitted	0.982			0.791		
Satd. Flow (perm)	1668	0	0	1488	1840	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	136				24	
Link Speed (mph)	30			30	30	
Link Distance (ft)	2425			3113	1166	
Travel Time (s)	55.1			70.8	26.5	
Confl. Bikes (#/hr)		2				1
Peak Hour Factor	0.72	0.72	0.87	0.87	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	125	208	34	126	716	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	333	0	0	160	832	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	10			10	10	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	2		2	2	2	
Detector Template						
Leading Detector (ft)	100		100	100	100	
Trailing Detector (ft)	2		2	2	2	
Detector 1 Position(ft)	2		2	2	2	
Detector 1 Size(ft)	6		6	6	6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	
Detector 2 Position(ft)	94		94	94	94	
Detector 2 Size(ft)	6		6	6	6	
Detector 2 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)	0.0		0.0	0.0	0.0	



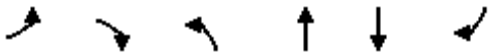
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Turn Type	Prot		Perm	NA	NA	
Protected Phases	8			6	2	
Permitted Phases			6			
Detector Phase	8		6	6	2	
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	
Minimum Split (s)	20.0		20.0	20.0	20.0	
Total Split (s)	20.0		40.0	40.0	40.0	
Total Split (%)	33.3%		66.7%	66.7%	66.7%	
Maximum Green (s)	15.0		35.0	35.0	35.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	1.0		1.0	1.0	1.0	
Lost Time Adjust (s)	-1.0			-1.0	-1.0	
Total Lost Time (s)	4.0			4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Minimum Gap (s)	2.0		2.0	2.0	2.0	
Time Before Reduce (s)	0.0		0.0	0.0	0.0	
Time To Reduce (s)	5.0		5.0	5.0	5.0	
Recall Mode	None		Min	Min	Min	
Walk Time (s)	5.0		5.0	5.0	5.0	
Flash Dont Walk (s)	10.0		10.0	10.0	10.0	
Pedestrian Calls (#/hr)	10		10	10	10	
Act Effct Green (s)	11.2			26.5	26.5	
Actuated g/C Ratio	0.24			0.57	0.57	
v/c Ratio	0.66			0.19	0.78	
Control Delay	17.5			5.7	14.1	
Queue Delay	0.0			0.0	0.0	
Total Delay	17.5			5.7	14.1	
LOS	B			A	B	
Approach Delay	17.5			5.7	14.1	
Approach LOS	B			A	B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 46.3			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 14.0		Intersection LOS: B	
Intersection Capacity Utilization 63.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 906: Lakemont Blvd & Forest Drive



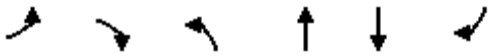
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	110	20	120	540	200	170
Future Volume (vph)	110	20	120	540	200	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt	0.979				0.938	
Flt Protected	0.959		0.950	0.999		
Satd. Flow (prot)	1749	0	1698	1785	1747	0
Flt Permitted	0.959		0.491	0.989		
Satd. Flow (perm)	1749	0	877	1767	1747	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	15				128	
Link Speed (mph)	30			30	30	
Link Distance (ft)	2425			3113	1166	
Travel Time (s)	55.1			70.8	26.5	
Peak Hour Factor	0.86	0.86	0.76	0.76	0.85	0.85
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%
Adj. Flow (vph)	128	23	158	711	235	200
Shared Lane Traffic (%)			10%			
Lane Group Flow (vph)	151	0	142	727	435	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	10			10	10	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	2		2	2	2	
Detector Template						
Leading Detector (ft)	100		100	100	100	
Trailing Detector (ft)	2		2	2	2	
Detector 1 Position(ft)	2		2	2	2	
Detector 1 Size(ft)	6		6	6	6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	
Detector 2 Position(ft)	94		94	94	94	
Detector 2 Size(ft)	6		6	6	6	
Detector 2 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)	0.0		0.0	0.0	0.0	
Turn Type	Prot		Perm	NA	NA	
Protected Phases	8			6	2	



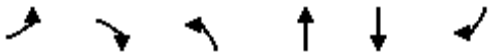
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases			6			
Detector Phase	8		6	6	2	
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	
Minimum Split (s)	20.0		20.0	20.0	20.0	
Total Split (s)	20.0		40.0	40.0	40.0	
Total Split (%)	33.3%		66.7%	66.7%	66.7%	
Maximum Green (s)	15.0		35.0	35.0	35.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	1.0		1.0	1.0	1.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Minimum Gap (s)	2.0		2.0	2.0	2.0	
Time Before Reduce (s)	0.0		0.0	0.0	0.0	
Time To Reduce (s)	5.0		5.0	5.0	5.0	
Recall Mode	None		Min	Min	Min	
Walk Time (s)	5.0		5.0	5.0	5.0	
Flash Dont Walk (s)	10.0		10.0	10.0	10.0	
Pedestrian Calls (#/hr)	10		10	10	10	
Act Effct Green (s)	9.7		30.8	30.8	30.8	
Actuated g/C Ratio	0.22		0.69	0.69	0.69	
v/c Ratio	0.38		0.23	0.59	0.35	
Control Delay	18.2		6.1	8.7	4.3	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	18.2		6.1	8.7	4.3	
LOS	B		A	A	A	
Approach Delay	18.2			8.3	4.3	
Approach LOS	B			A	A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 44.5			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 8.1		Intersection LOS: A	
Intersection Capacity Utilization 66.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 906: Lakemont Blvd & Forest Drive



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	90	150	30	110	680	110
Future Volume (vph)	90	150	30	110	680	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99				1.00	
Frt	0.916				0.981	
Flt Protected	0.982		0.950			
Satd. Flow (prot)	1668	0	1787	1881	1840	0
Flt Permitted	0.982		0.187			
Satd. Flow (perm)	1668	0	352	1881	1840	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	136				24	
Link Speed (mph)	30			30	30	
Link Distance (ft)	2425			3113	1166	
Travel Time (s)	55.1			70.8	26.5	
Confl. Bikes (#/hr)		2				1
Peak Hour Factor	0.72	0.72	0.87	0.87	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	125	208	34	126	716	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	333	0	34	126	832	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	10			10	10	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	2		2	2	2	
Detector Template						
Leading Detector (ft)	100		100	100	100	
Trailing Detector (ft)	2		2	2	2	
Detector 1 Position(ft)	2		2	2	2	
Detector 1 Size(ft)	6		6	6	6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	
Detector 2 Position(ft)	94		94	94	94	
Detector 2 Size(ft)	6		6	6	6	
Detector 2 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)	0.0		0.0	0.0	0.0	



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Turn Type	Prot		Perm	NA	NA	
Protected Phases	8			6	2	
Permitted Phases			6			
Detector Phase	8		6	6	2	
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	
Minimum Split (s)	20.0		20.0	20.0	20.0	
Total Split (s)	20.0		40.0	40.0	40.0	
Total Split (%)	33.3%		66.7%	66.7%	66.7%	
Maximum Green (s)	15.0		35.0	35.0	35.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	1.0		1.0	1.0	1.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Minimum Gap (s)	2.0		2.0	2.0	2.0	
Time Before Reduce (s)	0.0		0.0	0.0	0.0	
Time To Reduce (s)	5.0		5.0	5.0	5.0	
Recall Mode	None		Min	Min	Min	
Walk Time (s)	5.0		5.0	5.0	5.0	
Flash Dont Walk (s)	10.0		10.0	10.0	10.0	
Pedestrian Calls (#/hr)	10		10	10	10	
Act Effct Green (s)	11.2		26.5	26.5	26.5	
Actuated g/C Ratio	0.24		0.57	0.57	0.57	
v/c Ratio	0.66		0.17	0.12	0.78	
Control Delay	17.5		7.6	5.2	14.1	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	17.5		7.6	5.2	14.1	
LOS	B		A	A	B	
Approach Delay	17.5			5.7	14.1	
Approach LOS	B			A	B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 46.3			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 14.0		Intersection LOS: B	
Intersection Capacity Utilization 63.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 906: Lakemont Blvd & Forest Drive

APPENDIX E: OPINION OF PROBABLE CONSTRUCTION COSTS

City of Bellevue

Lakemont Blvd SE & SE Forest Dr - Alternative 1 Signal

Preliminary Opinion of Probable Construction Cost

ITEM	QTY	UNIT	UNIT COST	COST
PREPARATION				
Mobilization	1	LS	$53,000	$53,000
Construction Surveying	1	LS	$13,000	$13,000
Clearing & Grubbing	0.1	AC	$50,000	$5,000
TRAFFIC CONTROL				
Traffic Control	1	LS	$100,000	$100,000
GRADING				
Roadway Excavation Incl. Haul	50	CY	$50	$2,500
Gravel Borrow	40	TN	$30	$1,200
ROADWAY SECTION				
Planing Bituminous Pavement	0	SY	$8	$0
HMA Cl. 1/2 in. PG 58H-22	0	TN	$130	$0
Crushed Surfacing Base Course	50	TN	$40	$2,000
STORM DRAINAGE				
Stormwater Improvements	1	LS	$2,800	$2,800
EROSION CONTROL				
TESC	1	LS	$14,000	$14,000
CURBING				
Cement Conc. Curbs	110	LF	$40	$4,400
STRIPING & SIGNING				
Channelization and Signing	1	LS	$2,500	$2,500
TRAFFIC SIGNAL				
Traffic Signal	1	LS	$350,000	$350,000
SIDEWALK & RAMPS				
Cement Conc. Sidewalk	70	SY	$75	$5,250
Cement Concrete Curb Ramps	6	EA	$3,500	$21,000
OTHER ITEMS				
Landscaping	0	SY	$125	$0
Retaining Walls	500	SF	$100	$50,000
Miscellaneous/Unknown Costs	1	LS	$188,000	$188,000
			Subtotal	$814,650
			Contincency (30%)	$250,000
			Total	**$1,065,000**

City of Bellevue

Lakemont Blvd SE & SE Forest Dr - Alternative 2 Signal

Preliminary Opinion of Probable Construction Cost

ITEM	QTY	UNIT	UNIT COST	COST
PREPARATION				
Mobilization	1	LS	$77,000	$77,000
Construction Surveying	1	LS	$19,000	$19,000
Clearing & Grubbing	0.2	AC	$50,000	$10,000
TRAFFIC CONTROL				
Traffic Control	1	LS	$150,000	$150,000
GRADING				
Roadway Excavation Incl. Haul	470	CY	$50	$23,500
Gravel Borrow	380	TN	$30	$11,400
ROADWAY SECTION				
Planing Bituminous Pavement	2,660	SY	$8	$22,000
HMA Cl. 1/2 in. PG 58H-22	320	TN	$130	$41,600
Crushed Surfacing Base Course	610	TN	$40	$24,400
STORM DRAINAGE				
Stormwater Improvements	1	LS	$28,000	$28,000
EROSION CONTROL				
TESC	1	LS	$18,000	$18,000
CURBING				
Cement Conc. Curbs	810	LF	$40	$32,400
STRIPING & SIGNING				
Channelization and Signing	1	LS	$7,200	$7,200
TRAFFIC SIGNAL				
Traffic Signal	1	LS	$350,000	$350,000
SIDEWALK & RAMPS				
Cement Conc. Sidewalk	140	SY	$75	$10,500
Cement Concrete Curb Ramps	6	EA	$3,500	$21,000
OTHER ITEMS				
Landscaping & Irrigation	0	SY	$125	$0
Retaining Walls	1,000	SF	$150	$150,000
Miscellaneous/Unknown costs	1	LS	$299,000	$299,000
			Subtotal	$1,295,000
			Contincency (30%)	$390,000
			Total	**$1,685,000**

APPENDIX F: PUBLIC COMMENTS

COMMENT SHEET
Intersection Study on Lakemont Blvd
Open House – February 20, 2019

Your input is valuable. Please add your comments, questions, concerns, and ideas for one or more of the study intersections and leave this sheet with us tonight.

Lakemont Blvd and Forest Drive SE

No traffic light! a traffic light will be too disruptive for traffic on Lakemont

Lakemont Blvd SE and SE Newport Way

Like the roundabout solution to keep traffic moving

I-90 Eastbound On-ramp on SE Newport Way

Thank you for taking the time to provide your input.

Name: _____

Contact and/or address

_____

For more information about the project or to submit comments online, visit:
BellevueWa.gov/transportationlevy
You can also contact:
Jun An, P.E., Project Manager | 425-452-4230 | jan@BellevueWa.gov

COMMENT SHEET
Intersection Study on Lakemont Blvd
Open House – February 20, 2019

Your input is valuable. Please add your comments, questions, concerns, and ideas for one or more of the study intersections and leave this sheet with us tonight.

Lakemont Blvd and Forest Drive SE

At a minimum a left turn lane from Lakemont N to Forest would be a big help.
The traffic light would be a bigger help ~~[illegible]~~ for those turning from Forest onto Lakemont – Lower priority but still helpful.

Lakemont Blvd SE and SE Newport Way

No strong opinion on this one or the one below – traffic circles seem to make sense but disruptions from removal of existing lights and installation of circles is something I'm not looking forward to.

I-90 Eastbound On-ramp on SE Newport Way

Thank *ide your input.*

Name: _____

Contact **l/or address)**

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Jun An, P.E., Project Manager | 425-452-4230 | jan@BellevueWa.gov

COMMENT SHEET
Intersection Study on Lakemont Blvd
Open House – February 20, 2019

Your input is valuable. Please add your comments, questions, concerns, and ideas for one or more of the study intersections and leave this sheet with us tonight.

Lakemont Blvd and Forest Drive SE

Left hand turn FROM Lmt. Blvd Northbound into FD will dramatically Reduce backup on FD/Lmt Blvd junction IN THE AFTERNOON. TRAFFIC SIGNAL NOT NEEDED.

Lakemont Blvd SE and SE Newport Way

ROUNDABAUT is a slam dunk

I-90 Eastbound On-ramp on SE Newport Way

" " SAME

SE Cougar Mt Way / Lakemont signal: Real issues - NOT NEEDED except 7:00-10:00 AM & 3:30-6:30pm M-F. WEEKEND NOT NEEDED AT ALL CARS turning NORTH on Lakemont FROM Cougar Mt. Way trigger turn signal EVEN IF NO ONCOMING traffic forcing a stop.

Thank you for taking the time to provide your input.

Name: _____

Contact information (phone, email and/or address): _____

_____ _____

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BellevueWa.gov/transportationlevy
You can also contact:
Jun An, P.E., Project Manager | 425-452-4230 | jan@BellevueWa.gov

COMMENT SHEET
Intersection Study on Lakemont Blvd
Open House – February 20, 2019

Your input is valuable. Please add your comments, questions, concerns, and ideas for one or more of the study intersections and leave this sheet with us tonight.

Lakemont Blvd and Forest Drive SE

Left turn lane from Northbound Lakemont to Forest is good idea and would help. Just widening Forest to have fairly long right turn lane might be sufficient first step.

Lakemont Blvd SE and SE Newport Way

Double roundabout idea seem best option to me. It is sorely needed

I-90 Eastbound On-ramp on SE Newport Way

Just making left turn green arrow signal stay green longer would be a useful 1st step.

Thank you for taking the time to provide your input.

Name: _____

Contac **'or address):** _____

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BellevueWa.gov/transportationlevy
You can also contact:
Jun An, P.E., Project Manager | 425-452-4230 | jan@BellevueWa.gov

COMMENT SHEET
Intersection Study on Lakemont Blvd
Open House – February 20, 2019

Your input is valuable. Please add your comments, questions, concerns, and ideas for one or more of the study intersections and leave this sheet with us tonight.

Lakemont Blvd and Forest Drive SE

Has the volume of bicycle traffic on Lakemont been addressed? Traffic signal with left turn lane would work best but without left turn would work also

Lakemont Blvd SE and SE Newport Way

Round about looks like best option

I-90 Eastbound On-ramp on SE Newport Way

Really like 2 lanes for traffic onto I-90.

Thank you for taking the time to provide your input.

Name: _____

Contact information (phone, email and/or address): _____

_____

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BellevueWa.gov/transportationlevy
You can also contact:
Jun An, P.E., Project Manager | 425-452-4230 | jan@BellevueWa.gov

From:
To: An, Jun Suk
Subject: Feb 20th Open House
Date: Tuesday, February 26, 2019 1:20:02 AM

Dear Jun,

Thank you for the invitation we received with notification of your Open House on Feb 20th regarding the 3 nearby intersection studies currently underway. We were unable to attend and would like to offer some input regarding the intersection of Lakemont and Forest Drive. We have lived in the Forest Ridge neighborhood for 28 years so we have observed the transition from a newly developed extension of Forest Drive with the addition of several new neighborhoods to what is now a stable, fully built-out area. And therefore we have also had a great deal of experience driving through this intersection on a daily basis. Although there is a fairly consistent rate of traffic throughout the day, it is wonderful how efficiently it flows. We consider it an anomaly when there are any temporary delays turning from Forest Drive onto Lakemont Blvd and it can usually be attributed to stopping behind a school bus or utility/construction projects nearby on the roads. During rush hour in the evening there is a higher volume of cars going both directions on Lakemont but this rarely causes us any inconvenience. The visibility at that intersection is excellent and we have not had any safety concerns.

Therefore we strongly feel that we would not be well served with a traffic light there at the top of Forest Drive. We need cars to continue to move smoothly and efficiently to clear the area and a traffic light would have the opposite affect at that location. Further, the routine back up of cars that would be caused every time a red light was triggered by a car reaching that intersection on Forest Drive could actually impede our ability to exit our neighborhood from 156th onto Forest Drive because of our entry's proximity to that intersection and would similarly impact Summit Ridge neighborhood whose access to Forest Drive is directly across from ours.

In speaking with others in our neighborhood who are equally familiar with the intersection, the concept that seems more constructive would be to add a short turn lane on eastbound Forest Drive so that cars turning right (southbound?) onto Lakemont can do so smoothly without waiting. Then a short turn lane on Lakemont Blvd (northbound?) might be helpful to allow cars to continue to flow rather than waiting for those cars which are turning onto Forest Drive westbound.

In summary, we appreciate the study being done and we do not have any concerns about the current intersection. If your department has data that indicates a revision is advised for some reason, turn lanes should be studied. We believe that a light at this intersection would negatively impact what is currently a very well-functioning intersection all hours of the day. Those funds would be better used to assist with the growing traffic on Newport Way and those intersections you are currently studying there.

I hope this all makes sense … it's difficulty to describe our thoughts without using visuals! I would be happy to discuss this further or answer any questions you may have. Thank you very much for your time.

From:
To: An, Jun Suk
Subject: Neighborhood congestion reduction studies
Date: Wednesday, January 30, 2019 9:04:40 PM

Hi - As a resident of Lakemont Highlands, I received notification of the upcoming open house to discuss traffic congestion in our area on Feb. 20th. I will try to attend out of curiosity to see what is being considered for the intersections mentioned; I don't drive through those intersections on a regular basis during heavy traffic but can understand the need for mediation of congestion.

I'm writing, however, to ask why consideration of mediation of traffic congestion for residents who live in the Lakemont Highlands and Lakemont Woods neighborhoods and who try to get out onto Lakemont Blvd. during rush hour(s) isn't also up for discussion. Traffic along Lakemont is getting steadily worse, as anyone who pays attention must realize; residents of Renton regularly use Lakemont to get to and from I-90 and Coal Creek Parkway, and with the new residential housing near the Newcastle YMCA, it's only going to get worse - much worse. The city has done nothing to help reduce the impact of traffic - speed limits aren't enforced, people are allowed to line up for the turn onto Cougar Mountain Way from Lakemont by backing up into the only (and pathetic) way residents have to get out onto the street - the two-way turn lane on Lakemont; and there has been no mention of installation of a traffic light or roundabout to help the people who live along Lakemont - at the Lewis Creek Park entrance, for example. During rush hour, it is not unusual to sit for 7-8 minutes to try to get out of my Lakemont Highlands neighborhood onto Lakemont; I use the turn lane into Lewis Creek Park (illegally) when I can to get out of my neighborhood and decrease my wait. Just how bad does traffic have to get before the city realizes that residents have the right to be able to get out of their own neighborhoods within a reasonable period of time?

I look forward to hearing from you as to when I can expect the city to listen to my concerns and do something about the traffic problem along Lakemont. Instead of actually doing something about the traffic - widening the lanes, restricting use of the road to an extent, forbidding additional apartment construction until the mess is alleviated - the city appears content to allow things to stay as they are, making the occasional minor change when it's forced to. OK, I'll play - how do I force the city to protect my interests?

Sent from my iPad

From:
To: An, Jun Suk
Subject: Neighborhood Construction Congestion, Lakemont BLVD. SE and Forest Drive SE
Date: Friday, February 1, 2019 9:09:59 AM

Jan,

We are Our address is Bellevue, 98006. I will not be able to attend the open house scheduled for 2/20. We are really aware of the congestion and dangers at the nearby intersections. Taking a left from SE62nd onto Lakemont can be frustrating and dangerous at certain times during the day. There is often a back up at the light(Lakemont and Cougar Mountain way with car taking a left at the light to drop off and pick up kids attending the school up Cougar Mountain way. The back up can be such that you end up taking a right then turning around at Lewis Creek park to get in line to go through the light. Car are often traveling faster than the posted spend limit as they head down the hill towards the light after passing Lewis Creek park.

Maybe a solution could be to extend the current left hand turn lane for the light farther North on Lakemont.

I hope City of Bellevue can look at the stretch from SE62nd to Forest Drive to see if the safety can be improved and the traffic flow can improve during peak times.

Regards,

ReidMiddleton

728 134th Street SW, Suite 200
Everett, WA 98204-5322
(425) 741-3800
www.reidmiddleton.com
File No. 252018.003