



City of Bellevue

# Transportation Analysis Report SE 8<sup>th</sup> Street & Lake Hills Connector Bellevue, WA

July 2019

Contract # 1850215

PREPARED FOR



PREPARED BY

**ReidMiddleton**



**City of Bellevue Neighborhood Congestion Reduction Program  
SE 8th Street/Lake Hills Connector Corridor Transportation Analysis Report  
Contract Number 1850215  
July 2019**

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



7/18/2019

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## INTRODUCTION

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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

The SE 8th Street and Lake Hills Connector (LHC) Corridor is a major arterial that provides access to residential neighborhoods, schools, parks, and employment centers and travels between I-405 and Lake Hills. Figure 1 shows the project location. The intersection of SE 8th Street and LHC was selected for this evaluation because of the significant queuing and delay that occur during the peak commute hours, particularly for the northbound left-turn movement in the AM and the southbound through movement in the PM. The study area for this project was expanded to include the intersections to the south and west to determine if there were corridor-based solutions that could improve delay at the intersections and provide room for a future multi-use path without impacting the nearby wetlands. LHC and SE 8th Street are the future alignment for the Lake-to-Lake trail bicycle route.

The three existing signalized intersections being evaluated for this study include:

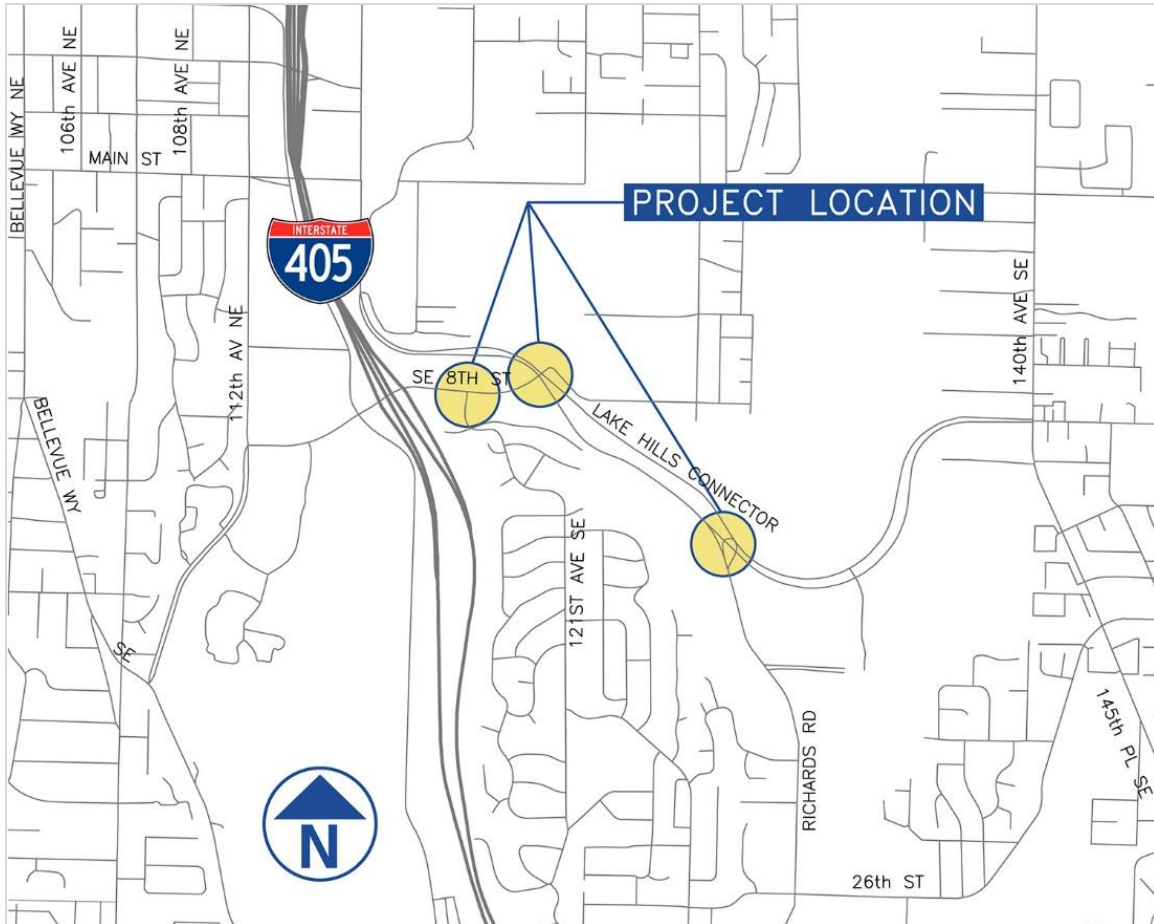
- SE 8th Street and 121st Avenue SE
- SE 8th Street and LHC
- LHC and Richards Road

The intersections of SE 8th Street and 121st Avenue SE and SE 8th Street and LHC are located approximately 900 feet apart. Although separate, distinct intersections, these locations are close enough to impact one another during peak hours with higher volumes. The intersection of LHC and Richards Road is approximately a 1/2 mile from SE 8th Street and LHC.

The following additional intersections within the study area were included in the analysis to provide a better understanding of traffic operations throughout the corridor:

- SE 8th Street and I-405 NB Ramp

- SE 8th Street and I-405 SB Ramp
- SE 8th Street and 114th Avenue SE
- LHC and 140th Avenue SE



**Figure 1. Vicinity Map.**

## Purpose

This report summarizes the analysis performed for the SE 8th Street and LHC Corridor. The study includes evaluation of existing conditions, future no-build conditions, and alternatives analysis for conceptual design alternatives for the three intersections. 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 for each location is included, along with a summary of the challenges and risks associated with the proposed alternatives.

## EXISTING CONDITIONS

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### Traffic Conditions

The SE 8th Street and LHC Corridor connects downtown Bellevue and I-405 to the neighborhoods east of I-405 and north of I-90. There are several trails and parks nearby (Kelsey Creek Park, Bannerwood Sports Park, Wilberton Hill Park), as well as schools (International School and Wilburton Elementary School). King County Metro operates multiple bus routes through the study area. Routes with stops located in the vicinity include 240, 246, 271, 823, 824, 887, and 889.

SE 8th Street is a five-lane roadway connecting 112th Avenue SE and I-405 to LHC. Sidewalks are available on one side of the roadway. West of 121st Avenue SE, the sidewalk is located on the north side of the roadway. East of 121st Avenue SE, the sidewalk is located on the south side of the roadway.

121st Avenue SE is a two-lane roadway that provides access to the Woodridge neighborhood. 121st Avenue SE has a sidewalk on the west side of the roadway. King County Metro operates bus route 246 through the study area. The posted speed is 25 MPH.

LHC is a divided four-lane roadway that traverses along Kelsey Creek Park. Sidewalk exists for much of the distance between SE 8th Street and Richards Road, transitioning to a shoulder about 700 feet southeast of SE 8th Street. A marked bike lane exists between SE 8th Street and Richards Road on the south shoulder of the eastbound roadway, with a striped buffer provided between the traveled way and bike lane. Elsewhere, shoulders are provided. The posted speed on LHC is 40 MPH.

Richards Road is a four- and five-lane roadway, with buffered bike lanes and sidewalks on both sides of the roadway. Richards Road provides access to the I-90 corridor and Factoria. The posted speed on Richards Road is 35 MPH.

### SE 8th Street and 121st Avenue SE

Traffic counts were conducted in November 2018 at all project intersections (see Appendix A). Figure 2 shows the existing peak-hour volumes for the SE 8th Street and 121st Avenue SE intersection.



**Figure 2. Existing Peak-Hour Traffic Volumes (SE 8th Street and 121st Avenue SE).**

Existing traffic conditions were modeled using Synchro (see Appendix C). The results of the analysis are shown in Table 1. The results indicate that no significant delay occurs for vehicles using the intersection.

During a field visit, only light to moderate volumes were observed at the intersection of SE 8th Street and 121st Avenue SE.

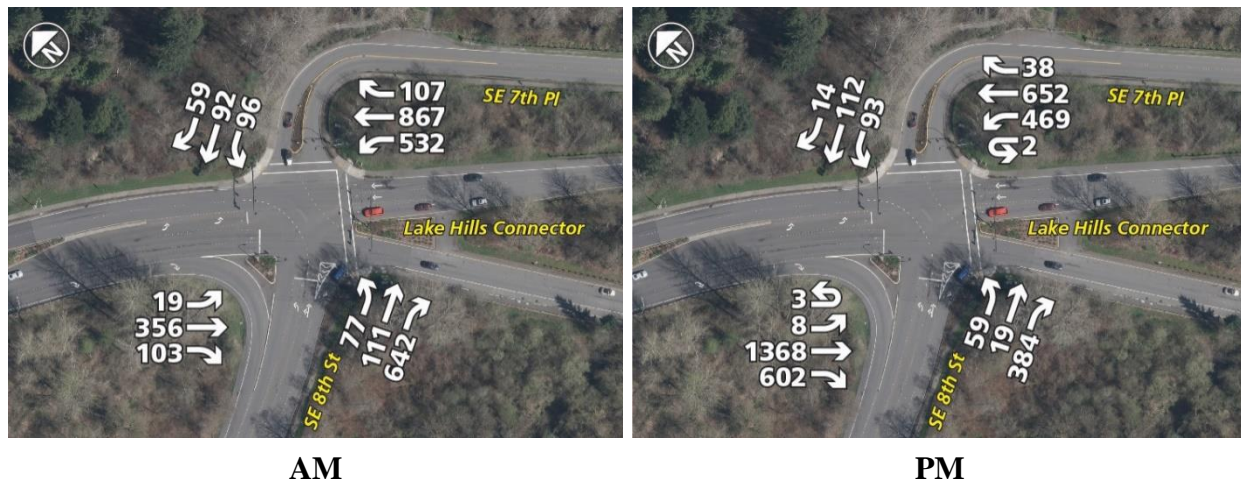
**Table 1. Existing Conditions – Synchro Results (SE 8th Street and 121st Avenue SE)**

		Existing Conditions (Current)			
Street	Movement	Delay(s)	LOS	Avg. Queue	95th Percentile Queue
<b>AM Peak</b>					
SE 8th Street	EBT/R	15	B	328	405
	WBL	5	A	4	13
	WBT	5	A	73	124
121st Avenue SE	NBL	57	E	159	227
	NBR	11	B	1	36
<b>Intersection</b>		<b>15</b>	<b>B</b>		
<b>PM Peak</b>					
SE 8th Street	EBT/R	8	A	108	117
	WBL	5	A	35	31
	WBT	4	A	134	94
121st Avenue SE	NBL	65	E	113	159
	NBR	15	B	0	28
<b>Intersection</b>		<b>10</b>	<b>A</b>		



## SE 8th Street and LHC

Figure 3 shows the existing peak-hour volumes for the SE 8th Street and LHC intersection.



**Figure 3. Existing Peak-Hour Traffic Volumes (SE 8th Street and LHC).**

Existing traffic conditions were modeled using Synchro (see Appendix C). The results of the analysis are shown in Table 2. The results indicate the intersection is close to capacity at the existing peak hours. Long delays and vehicle queues result in poor levels of service.

During a field visit, the following observations were made:

During the walk phase for the crosswalk on the south leg of the intersection, heavy eastbound right-turn traffic contributes to the potential for pedestrian conflicts with many drivers not paying adequate attention to pedestrians. During the field visit, a concerned citizen indicated that this crossing is very dangerous for students. The citizen also expressed concern about eastbound right-turning vehicles potentially colliding with buses at the far-side bus stop just south of the intersection. High pedestrian activity was observed.

The eastbound right-turn volume is heavy, and the queue is occasionally long, but the queue was noted to always clear after the end of each cycle. There is heavy southbound right-turn volume, but the southbound through volume was observed to consistently block both left- and right-turn lanes. Westbound queues were observed to exceed 700 feet. The northbound left-turn lane queue consistently spills onto the left-most through lane, even prior to the PM peak period.

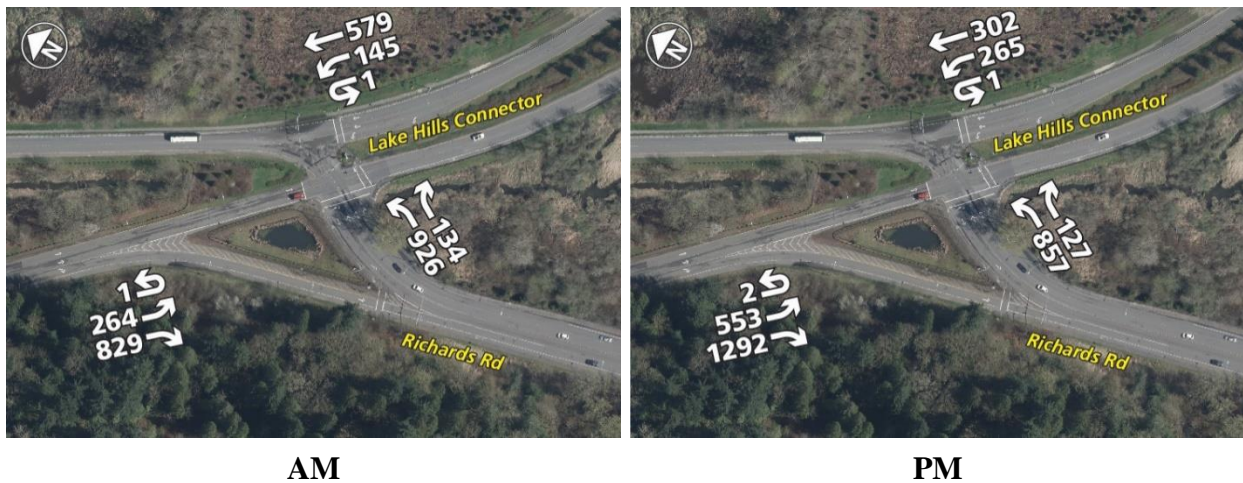


**Table 2. Existing Conditions – Synchro Results (SE 8th Street and LHC).**

		Existing Conditions (Current)			
Street	Movement	Delay(s)	LOS	Avg. Queue	95th Percentile Queue
<b>AM Peak</b>					
SE 8th Street	EBL	55	E	63	112
	EBL/T	64	E	111	176
	EBR	18	B	140	268
SE 7th Place	WBL/T/R	69	E	277	284
Lake Hills Connector	SBL	60	E	16	43
	SBT	46	D	148	200
	SBR	0	A	0	49
	NBL	106	F	627	823
	NBT/R	27	C	398	463
<b>Intersection</b>		<b>46</b>	<b>D</b>		
<b>PM Peak</b>					
SE 8th Street	EBL	62	E	44	72
	EBL/T	62	E	46	77
	EBR	12	B	123	138
SE 7th Place	WBL/T/R	68	E	184	364
Lake Hills Connector	SBL	57	E	10	29
	SBT	215	F	950	1072
	SBR	1	A	0	0
	NBL	49	D	398	578
	NBT/R	12	B	132	231
<b>Intersection</b>		<b>91</b>	<b>F</b>		

## Lake Hills Connector and Richards Road

Figure 4 shows the existing peak-hour volumes for the LHC and Richards Road intersection.



**Figure 4. Existing Peak-Hour Traffic Volumes (LHC and Richards Road).**

Existing traffic conditions were modeled using Synchro (see Appendix C). The results of the analysis are shown in Table 3. The results indicate the intersection is operating at LOS C or better under existing peak hour conditions. Left-turn movements are functioning at lower levels of service, but the overall intersection has sufficient capacity for the current traffic volumes.

At the intersection of LHC and Richards Road, the eastbound right-turn volume was observed to be very heavy and maintains a high speed during this movement. There is a pedestrian signal to cross the eastbound right-turn slip lane, but no pedestrian activity was observed at this intersection. Richards Road has bike lanes, but the northbound lane ends before meeting this intersection. LHC has a bike lane only in the eastbound direction. Both the northbound and westbound left-turn movements had heavy volumes, but the westbound through volume was observed to be only moderate.

**Table 3. Existing Conditions – Synchro Results (LHC and Richards Road).**

		Existing Conditions (Current)			
Street	Movement	Delay(s)	LOS	Avg. Queue	95th Percentile Queue
<b>AM Peak</b>					
Lake Hills Connector	EBT	27	C	56	103
	EBR	2	A	0	0
	WBL	32	C	60	137
	WBT	14	B	92	145
Richards Road	NBL	19	B	179	288
	NBR	2	A	3	19
<b>Intersection</b>		<b>14</b>	<b>B</b>		
<b>PM Peak</b>					
Lake Hills Connector	EBT	23	C	158	204
	EBR	5	A	0	0
	WBL	99	F	268	411
	WBT	8	A	54	67
Richards Road	NBL	59	E	365	476
	NBR	9	A	24	61
<b>Intersection</b>		<b>30</b>	<b>C</b>		

## 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 reports were analyzed and post-processed, and crashes were grouped based on different crash types for each of the intersections. The crash data is shown in Tables 4, 5, and 6.

**Table 4. Collision History (SE 8th Street and 121st Avenue SE).**

	Crash Count
Approach Turn	1
Head On	1
Other	1
Parked Vehicle/Fixed Object	0
Pedestrian	0
Rear End	3
Right Angle	0
Sideswipe/Lane Change	1
<b>Total</b>	<b>8</b>

At the intersection of SE 8th Street and 121st Avenue SE, there were only eight crashes in the last five years. The most common crash type was rear-end, which occurred in the eastbound and westbound directions. These are common collisions at signalized intersections.

**Table 5. Collision History (SE 8th Street and LHC).**

	Crash Count
Approach Turn	13
Head On	1
Other	0
Parked Vehicle/Fixed Object	8
Pedestrian	2
Rear End	14
Right Angle	4
Sideswipe/Lane Change	12
<b>Total</b>	<b>54</b>

There was a total of 54 crashes at the intersection of SE 8th Street and LHC in the last five years. The most common crash types were rear-end and approach turn collisions. Rear-end collisions were the most common crashes for northbound vehicles. Turning movement collisions occurred most frequently for the northbound left-turn movement conflicting with the southbound through movement. Flashing yellow permissive left-turn signal displays at the SE 8th Street intersection were in place from 2011 to October 2015. This permissive movement likely contributed to increased approach turn collisions. The signal was modified in October of 2015 to change to a protected-only left-turn movement. Only one left-turn collision occurred after the revision.

**Table 6. Collision History (LHC and Richards Road).**

	Crash Count
Approach Turn	21
Head On	0
Other	1
Parked Vehicle/Fixed Object	5
Pedestrian	0
Rear End	6
Right Angle	6
Sideswipe/Lane Change	6
<b>Total</b>	<b>45</b>

There has been a total of 45 crashes at the intersection of LHC and Richards Road in the last five years. Almost half of these crashes were approach turn collisions. Analysis shows that these turning movement crashes primarily occurred in the westbound left-turn movement, conflicting with eastbound through traffic. Optically programmed left-turn signal displays at the Richards

Road intersection were in place prior to October 2015. The signal heads were difficult to see and may have contributed to drivers misidentifying signal displays. The signal heads were replaced with standard displays in October 2015. Only four left-turn collisions occurred after the revision.

## Public Outreach

An open house for the SE 8th Street and LHC Corridor analysis was conducted on the evening of March 26, 2019, at the Bellevue Botanical Garden Educational Center. Comments received included comment cards from open house participants and email correspondence from some community members that were unable to attend. The following list summarizes the comments received.

- The intersection of SE 8th Street and LHC is the worst intersection of the corridor. The other locations do not seem that bad.
- Traffic trying to access I-405 may back up to 121st Avenue SE and block the intersection. This would be a greater concern for the roundabout option shown for the intersection.
- Considerations should be given to further extending right and left turn pockets for the intersection of SE 8th Street and LHC.
- Pedestrian access for the roundabout option at SE 8th Street and LHC is a concern. Students from the International School use the intersection to access bus stops and might have difficulty navigating the roundabout.
- Has an overpass at SE 8th Street and LHC been considered?
- The traffic light alternative at SE 8th Street and LHC may provide better control of the intersection during high volumes. There is concern that the roundabout might have traffic stopped within the intersection and completely shut down functionality.
- There are lots of vehicles that speed along LHC.
- Consider eliminating one left-turn lane from SE 8th Street to LHC. A single left-turn lane and separate through lane to SE 7th Place seems like it will work.
- Education for roundabout options will be needed. Most people do not know how to drive roundabouts.
- Traffic signal coordination should be broader than just these intersections.

Copies of the comments received are included in Appendix E.

# TRAFFIC ANALYSIS

## Modeling Methodology

AM and PM peak-hour traffic analyses were conducted to evaluate operational improvements at the SE 8th Street and LHC Corridor intersections. The operation analysis covered Existing, Future No-Build, and Future Build conditions for the study area.

Synchro was used for analysis of signal alternatives and Sidra was used to evaluate roundabout alternatives (see Appendix C). The City of Bellevue provided the 2035 future volumes used in this analysis and shown in Table 7.

## Traffic Volumes

**Table 7. Intersection Volumes.**

Location	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
SE 8th/121st (AM)	0	920	80	20	810	0	240	0	60	0	0	0
	0	776	79	23	704	0	195	0	54	0	0	0
SE 8th/121st (PM)	0	400	320	230	1010	0	160	0	30	0	0	0
	0	427	182	190	993	0	115	0	34	0	0	0
SE 8th/LHC (AM)	90	160	750	90	90	50	630	980	160	30	420	120
	77	111	642	96	92	59	532	867	107	19	356	103
SE 8th/LHC (PM)	70	30	330	150	170	30	430	790	70	20	1470	620
	59	19	384	93	112	14	471	652	38	11	1368	602
LHC/Rich (AM)	0	350	910	130	630	0	1110	0	160	0	0	0
	0	265	829	146	579	0	926	0	134	0	0	0
LHC/Rich (PM)	0	620	1310	310	430	0	900	0	120	0	0	0
	0	555	1292	266	302	0	857	0	127	0	0	0

Legend: 2035 Intersection Volumes  
Existing Volumes

## Alternatives Analysis

Future scenarios were considered for the three study intersections in the corridor. Alternatives analysis considered modifications to the signalized intersections as well as roundabout options for each intersection. The primary objective of the analysis was to improve the intersection of SE 8th Street and LHC. One alternative considered was to implement roundabouts at the other two intersections to see if a travel lane between each roundabout pair could be dropped and repurposed as a multi-use path.

Each intersection has been evaluated for the following:

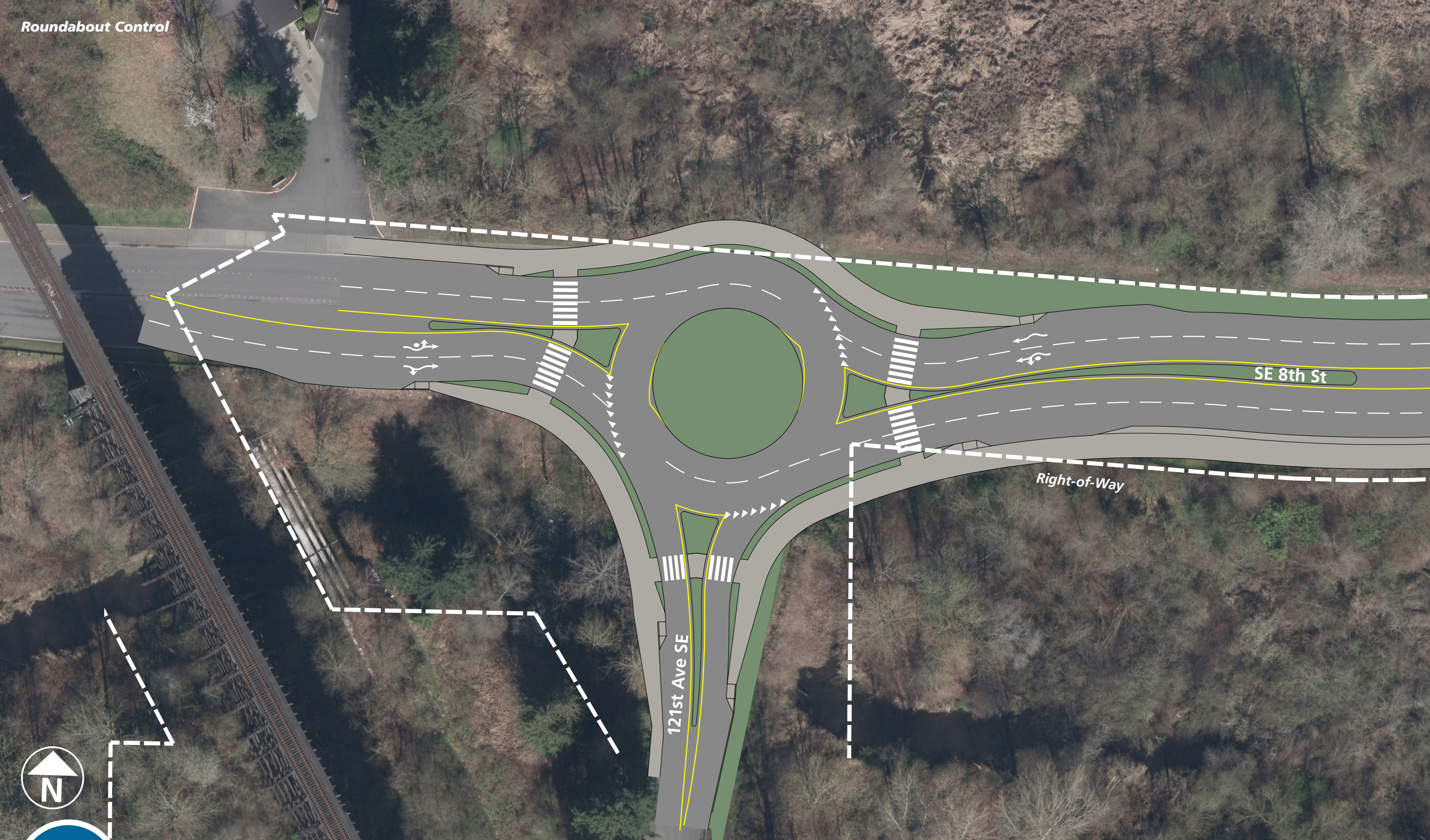
- Future No Build: Maintain existing configuration.
- Signalized Alternatives: Signalized improvements (if needed) to the intersection.
- Roundabout Alternatives: Roundabout options for the intersection.

### **SE 8th Street and 121st Avenue SE**

Synchro analysis was performed for future peak-hour volumes for the SE 8th Street and 121st Avenue SE intersection to evaluate a Future No-Build option. The results indicated that the intersection would operate at LOS B or better during both peak hours. Therefore, no further improvements to the existing signal are deemed necessary.

Sidra analysis performed for future peak-hour volumes showed that the optimal roundabout configuration would be a hybrid, with two entry lanes for both eastbound and westbound approaches and a single-lane entry for the northbound approach on 121st Avenue SE. A conceptual plan showing the roundabout alternative is shown on Figure 5.





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Figure 5 – SE 8th Street/121st Avenue SE – Alternative 1





Table 8 provides a breakdown of the traffic analysis for the Future No-Build and Future Roundabout Alternative for SE 8th Street and 121st Avenue SE.

**Table 8. Synchro & Sidra Results (SE 8th Street and 121st Avenue SE).**

		Future No-Build (No Change)				Alt. 1 (Roundabout)				
Street	Movement	Delay (s)	LOS	Avg. Queue	95th Percentile Queue	Movement	Delay (s)	LOS	V/C	95th Percentile Queue
SE 8th St	EBT/R	21	C	467	546	EB	3.5	A	0.37	64
	WBL	7	A	4	14	WB	4.6	A	0.35	58
	WBT	7	A	102	172	-	-	-	-	-
121st Ave	NBL	55	D	210	253	NB	8.9	A	0.46	56
	NBR	15	B	12	41	-	-	-	-	-
<b>Intersection</b>		<b>20</b>	<b>B</b>			<b>Intersection</b>	<b>4.7</b>	<b>A</b>	<b>0.46</b>	<b>64</b>
SE 8th St	EBT/R	8	A	105	136	EB	4.5	A	0.31	48
	WBL	9	A	53	96	WB	5.2	A	0.48	88
	WBT	6	A	138	203	-	-	-	-	-
121st Ave	NBL	64	E	156	205	NB	6.6	A	0.25	28
	NBR	19	B	5	31	-	-	-	-	-
<b>Intersection</b>		<b>12</b>	<b>B</b>			<b>Intersection</b>	<b>5.1</b>	<b>A</b>	<b>0.48</b>	<b>88</b>

Several other factors have been considered in addition to the traffic operations at the intersection. Table 9 provides a summary of various criteria for the No-Build and preferred roundabout option (Alternative 1). A preliminary Opinion of Probable Construction Costs for Alternative 1 can be found in Appendix B.

**Table 9. Preferred Alternatives Analysis (SE 8th Street and 121st Avenue SE).**

Future No Build – Maintain Existing Signal	Alternative 1 - Roundabout
<b>Traffic Operations</b>	
LOS B (LOS E for 121st)	LOS A (All Approaches) Potential backups of WB vehicles trying to access I-405 clogging the roundabout.
<b>Traffic Safety</b>	
No Change. Intersection continues to operate well.	Reduced number of conflict points as well as vehicle speeds through the intersection may reduce both the number of crashes and crash severity.
<b>Right-of-Way</b>	
None	Right-of-way needed to accommodate roundabout and multi-use path.

**Table 9. Preferred Alternatives Analysis (SE 8th Street and 121st Avenue SE).**

Future No Build – Maintain Existing Signal	Alternative 1 - Roundabout
<b>Stormwater Impacts</b>	
None	Increase in impervious surfacing and new hard surfacing triggers stormwater treatment and flow control
<b>Utility Impacts</b>	
None	Adjustment/relocation of underground utilities as needed to accommodate improvements.
<b>Environmental Impacts</b>	
None	Encroachment into adjacent wetlands and stream buffers will require mitigation.
<b>Construction Costs</b>	
None	\$3,800,000 (see Appendix D)

Alternative 1 was also assessed to identify how it impacts the Multi-Modal LOS for pedestrians, bikes, and transit. Table 10 summarizes the assessment.

**Table 10. Preferred Alternatives MMLOS Analysis (SE 8th Street and 121st Avenue SE).**

Element	Alternative 1 - Roundabout
<b>Pedestrian LOS</b>	
Sidewalk & Landscape Buffer	Improves: Multi-use path with landscape buffer is provided within the roundabout.
Intersection Treatment	Improves: The number of conflict points between vehicles and pedestrians is reduced.
<b>Bicycle LOS</b>	
Intersection Treatment	Improves: Multi-use path with bicycle ramps is provided on all entrances and exits of the roundabout to give bicyclists the option of having a physical separation from vehicles.
<b>Transit LOS</b>	
Passenger Amenities	No change
Transit Speed	Improves: Vehicle delay is reduced, which reduces travel times for transit.

### SE 8th Street and LHC

Synchro and Sidra analyses were performed for future peak-hour volumes for the SE 8th Street and LHC intersection to evaluate Future No-Build, Future Modified Signal, and Future Roundabout

alternatives (see Table 11 for a breakdown of the results). The results show that the intersection drops to LOS F in the PM peak hour with no improvements in the future design year 2035.

Synchro analysis of various modifications of the existing signalized configuration demonstrated that adding a second northbound lane provides the optimal improvement for the signal operation. This alternative (Alternative 1) improves the intersection operation from LOS F to LOS D in the future design year. A conceptual plan showing the modified signal alternative is shown on Figure 6.

Sidra analysis performed for future peak-hour volumes showed that the optimal roundabout configuration would be a two-lane roundabout with right-turn bypass lanes on the southbound and eastbound approaches. A conceptual plan showing the roundabout alternative is shown on Figure 7. Note that the layout shown is not striped with two full circulating lanes as assumed in the analysis, but could be constructed so that two full circulating lanes could be implemented if and when needed by simply restriping.

**Table 11. 2035 Alternatives – Synchro & Sidra Results (SE 8th Street and LHC).**

Street	Movement	Future No-Build				Alternative 1 – Modified Signal				Alternative 2 - Roundabout				
		Delay (s)	LOS	Avg. Queue	95th Percentile Queue	Delay (s)	LOS	Avg. Queue	95th Percentile Queue	Movement	Delay (s)	LOS	V/C	95th Percentile Queue
<b>AM Peak</b>														
SE 8th St	EBT/R	54	D	81	124	-	-	-	-	EB	9.6	A	0.87	282
	EBL/T	73	E	180	238	114	F	283	388	-	-	-	--	
	EBR	65	C	303	468	28	C	259	440	-	-	-	--	
SE 7th Pl	WBL/T/R	62	E	192	270	63	E	193	270	WB	18.5	B	0.66	106
Lake Hills Connector	SBL	63	E	30	66	63	E	30	66	SB	8.6	A	0.33	73
	SBT	48	D	187	241	52	D	193	249	-	-	-	-	-
	SBR	0	A	0	0	0	A	0	0	-	-	-	-	-
	NBL	119	F	709	2018	37	D	243	334	NB	13.9	B	0.88	390
	NBT/R	28	C	436	584	29	C	434	584	-	-	-	-	-
<b>Intersection</b>		<b>52</b>	<b>D</b>			<b>40</b>	<b>D</b>				<b>13.9</b>	<b>B</b>	<b>0.88</b>	<b>390</b>
<b>PM Peak</b>														
SE 8th St	EBT/R	61	E	56	78	-	-	-	-	EB	18.2	B	0.82	188
	EBL/T	60	E	58	78	89	F	122	172	-	-	-	--	
	EBR	8	A	109	42	42	D	166	207	-	-	-	--	
SE 7th Pl	WBL/T/R	142	F	363	645	88	F	361	556	WB	12.3	B	0.56	81
Lake Hills Connector	SBL	58	E	20	49	68	E	23	55	SB	17.5	B	0.86	466
	SBT	298	F	1056	1177	60	E	833	993	-	-	-	-	-
	SBR	1	A	0	0	1	A	0	0	-	-	-	-	-
	NBL	47	D	353	491	99	F	248	369	NB	6.8	A	0.56	112
	NBT/R	16	B	248	304	22	C	315	377	-	-	-	-	-
<b>Intersection</b>		<b>126</b>	<b>F</b>			<b>49</b>	<b>D</b>				<b>13.9</b>	<b>B</b>	<b>0.86</b>	<b>466</b>







Figure 6 – SE 8th Street/Lake Hills Connector – Alternative 1







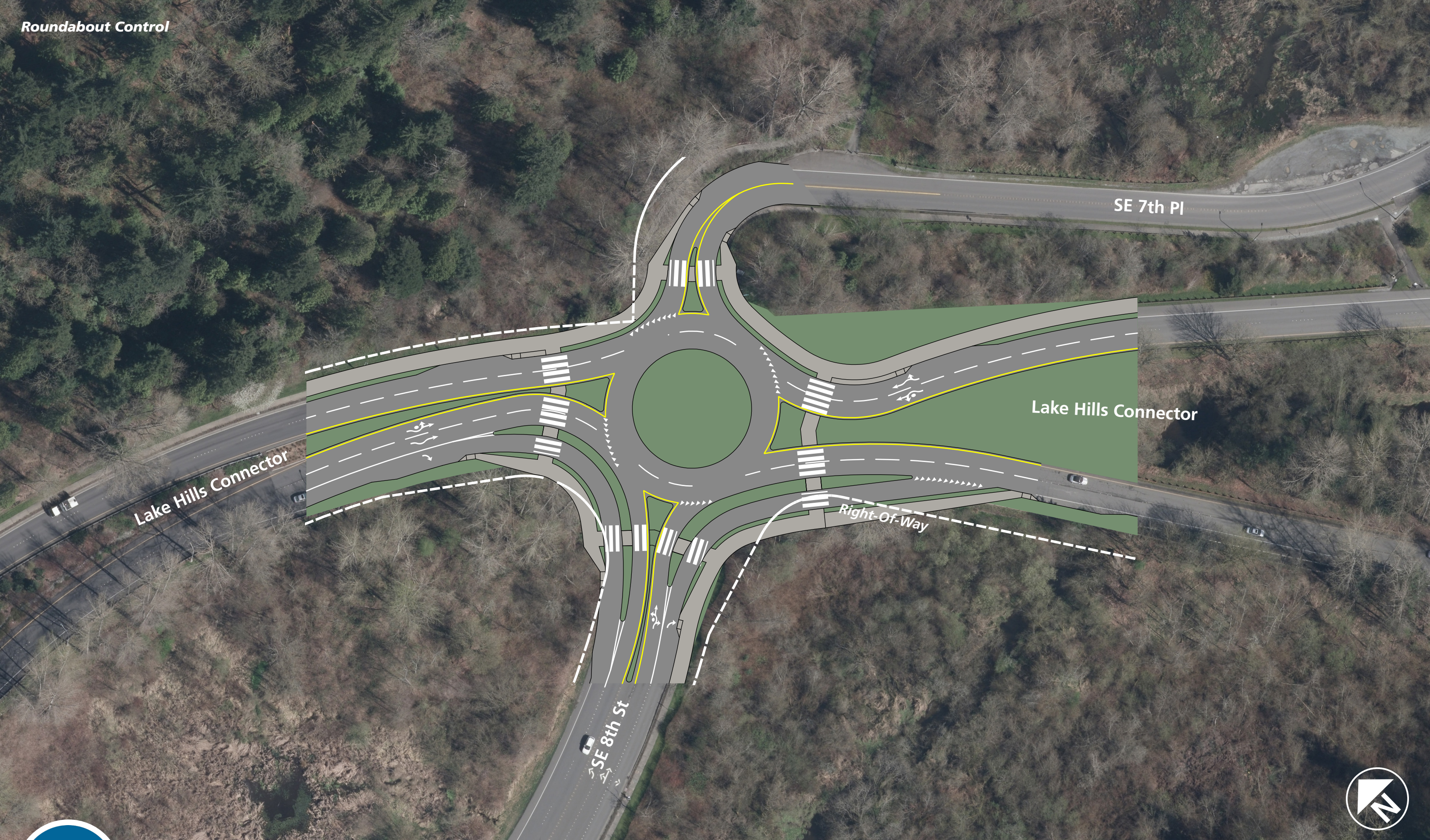


Figure 7 – SE 8th Street/Lake Hills Connector – Alternative 2





Several other factors have been considered in addition to the traffic operations at the intersection. Table 12 provides a summary of various criteria for the preferred signal option (Alternative 1) and preferred roundabout option (Alternative 2). A preliminary Opinion of Probable Construction Costs for each of the preferred alternatives can be found in Appendix B.

**Table 12. Preferred Alternatives Analysis (SE 8th Street and LHC).**

<b>Future No Build</b>	<b>Alternative 1 – Modified Signal</b>	<b>Alternative 2 – Roundabout</b>
<b>Traffic Operations</b>		
LOS F SE 8th: Moderate delays/queueing LHC: Significant queues during AM and PM Peak	LOS D (LOS E/F for SE 8th/SE 7th) SE 8th: Increased EB delay. LHC: Improved SB delay/queueing	LOS B (LOS A/B All Approaches) V/C exceeds 0.85 in 2035, indicating that the roundabout will begin to approach capacity.
<b>Traffic Safety</b>		
Signalized operations with higher volumes likely to result in continued rear-end crashes.	Reduced congestion and queueing may reduce the number of crashes.	Reduced number of conflict points as well as vehicle speeds through the intersection may reduce both the number of crashes and crash severity.
<b>Right-of-Way</b>		
None	None	Right-of-way needed to accommodate roundabout and multi-use trail.
<b>Stormwater Impacts</b>		
None	Minor increase in impervious surfacing, minimal stormwater mitigation.	Increase in impervious surfacing and new hard surfacing triggers stormwater treatment and flow control.
<b>Utility Impacts</b>		
None	None	Adjustment/relocation of underground utilities as needed to accommodate improvements.
<b>Environmental Impacts</b>		
None	None	Encroachment into adjacent wetlands and stream buffers will require mitigation.
<b>Construction Costs</b>		
None	\$1,400,000 (see Appendix D)	\$6,500,000 (see Appendix D)

Each alternative was also assessed to identify how it impacts the Multi-Modal LOS for pedestrians, bikes, and transit. Table 13 summarizes the assessment.

**Table 13. Preferred Alternatives MMLOS Analysis (SE 8th Street and LHC)**

Element	Alternative 1 – Modified Signal	Alternative 2 - Roundabout
<b>Pedestrian LOS</b>		
Sidewalk & Landscape Buffer	No change	Improves: Multi-use path with landscape buffer is provided within the roundabout.
Intersection Treatment	No change	Improves: The number of conflict points between vehicles and pedestrians is reduced.
<b>Bicycle LOS</b>		
Intersection Treatment	No change	Improves: Multi-use path with bicycle ramps is provided on all entrances and exits of the roundabout to give bicyclists the option of having a physical separation from vehicles.
<b>Transit LOS</b>		
Passenger Amenities	No change	No change
Transit Speed	Improves: Vehicle delay is reduced, which reduces travel times for transit.	Improves: Vehicle delay is reduced, which reduces travel times for transit.

### Lake Hills Connector and Richards Road

Synchro analysis was performed for future peak-hour volumes for the LHC and Richards Road intersection to evaluate a Future No-Build option. The results indicated that the intersection would operate at LOS D or better during both peak hours. Therefore, no further improvements to the existing signal are deemed necessary.

Sidra analysis performed for future peak-hour volumes showed that the optimal roundabout configuration would be a hybrid, with two entry lanes for both northbound and westbound approaches and a single-lane entry for the eastbound approach, along with a right-turn bypass. A conceptual plan showing the roundabout alternative is shown on Figure 8.





Figure 8 – Lake Hills Connector/Richards Road – Alternative 1







Table 14 provides a breakdown of the traffic analysis for the Future No-Build and Future Roundabout Alternative for LHC at Richards Road.

**Table 14. 2035 Alternatives – Synchro & Sidra Results (LHC and Richards Road).**

Street	Movement	Future No-Build				Alternative 1 – Roundabout				
		Delay (s)	LOS	Avg. Queue	95th Percentile Queue	Movement	Delay (s)	LOS	V/C	95th Percentile Queue
<b>AM Peak</b>										
Lake Hills Connector	EBT	27	C	70	124	EB	4.1	A	0.41	81
	EBR	2	A	0	0	-	-	-	-	-
	WBL	33	C	58	123	WB	10.0	A	0.61	104
	WBT	14	B	109	157	-	-	-	-	-
Richards Road	NBL	19	B	185	332	NB	10.0	B	0.54	108
	NBR	2	A	3	23	-	-	-	-	-
<b>Intersection</b>		<b>14</b>	<b>B</b>				<b>7.8</b>	<b>A</b>	<b>0.61</b>	<b>108</b>
<b>PM Peak</b>										
Lake Hills Connector	EBT	24	C	182	232	EB	6.3	A	0.67	193
	EBR	6	A	0	0	-	-	-	-	-
	WBL	147	F	368	510	WB	10.2	B	0.56	95
	WBT	9	A	81	96	-	-	-	-	-
Richards Road	NBL	64	E	390	516	NB	13.4	B	0.58	154
	NBR	9	A	24	60	-	-	-	-	-
<b>Intersection</b>		<b>36</b>	<b>D</b>				<b>8.6</b>	<b>A</b>	<b>0.67</b>	<b>193</b>

Several other factors have been considered in addition to the traffic operations at the intersection. Table 15 provides a summary of various criteria for the No-Build and preferred roundabout option (Alternative 1). A preliminary Opinion of Probable Construction Costs for Alternative 1 can be found in Appendix B.

**Table 15. Preferred Alternatives Analysis (LHC and Richards Road).**

Future No Build	Alternative 1 – Roundabout
<b>Traffic Operations</b>	
LOS D (LOS B for AM) LHC: Delays/queueing for WB in PM. Richards Rd: Delays/queueing for NB in PM.	LOS A (LOS A or B for all approaches).
<b>Traffic Safety</b>	
Signalized operations with higher volumes likely to result in continued rear-end crashes.	Reduced number of conflict points as well as vehicle speeds through the intersection may reduce both the number of crashes and crash severity.

**Table 15. Preferred Alternatives Analysis (LHC and Richards Road).**

<b>Future No Build</b>	<b>Alternative 1 – Roundabout</b>
<b>Right-of-Way</b>	
None	None. Sufficient right-of-way exists for proposed improvements.
<b>Stormwater Impacts</b>	
None	Increase in impervious surfacing and new hard surfacing triggers stormwater treatment and flow control. Relocation/reconstruction of existing stormwater pond required.
<b>Utility Impacts</b>	
None	Adjustment/relocation of underground utilities as needed to accommodate improvements.
<b>Environmental Impacts</b>	
None	Encroachment into adjacent wetlands and stream buffers will require mitigation.
<b>Construction Costs</b>	
None	\$6,000,000 (see Appendix D)

Alternative 1 was also assessed to identify how it impacts the Multi-Modal LOS for pedestrians, bikes, and transit. Table 16 summarizes the assessment.

**Table 16. Preferred Alternatives MMLOS Analysis (LHC and Richards Road).**

<b>Element</b>	<b>Alternative 1 - Roundabout</b>
<b>Pedestrian LOS</b>	
Sidewalk & Landscape Buffer	Improves: Multi-use path with landscape buffer is provided within the roundabout.
Intersection Treatment	Improves: The number of conflict points between vehicles and pedestrians is reduced.
<b>Bicycle LOS</b>	
Intersection Treatment	Improves: Multi-use path with bicycle ramps is provided on all entrances and exits of the roundabout to give bicyclists the option of having a physical separation from vehicles.
<b>Transit LOS</b>	
Passenger Amenities	No change
Transit Speed	Improves: Vehicle delay is reduced, which reduces travel times for transit.

In conducting the roundabout analysis as described above, the viability of eliminating a westbound lane along SE 8th Street and LHC was also considered, for the purpose of accommodating a multi-use path along the north side of the roadway, within the existing roadway prism. If all three intersections were converted to roundabouts, each of the roundabout configurations would accommodate a multi-use path through the intersection. However, two westbound lanes are needed exiting the roundabout at Richards Road and entering the roundabout at SE 8th Street and LHC; therefore, some widening outside the existing roadway prism would be necessary between the two intersections to accommodate a multi-use path.

## Recommended Alternative

The roundabout alternative for the SE 8th Street and LHC intersection is considered the best long-term solution at this location because it significantly reduces congestion and would have a calming effect on traffic. However, the modified signal option is recommended as the best near-term solution because it provides needed congestion relief at less than a quarter of the cost of a roundabout. Converting the intersection of SE 8th Street and 121st Avenue SE to a roundabout, on the other hand, provides minimal congestion reduction over the No Build Alternative, and should only be considered as a companion improvement to a roundabout at SE 8th Street and LHC to eliminate the possibility of signal queues backing up into the adjacent roundabout. The roundabout alternative at LHC and Richards Road is recommended only as a long-term solution since the existing signal will operate at an adequate level of service in the near to mid-term.

## Anticipated Benefits

The anticipated benefits of the recommended alternatives are summarized in Table 17.

**Table 17. Anticipated Benefits.**

Location	Recommended Alternative	Anticipated Benefits
SE 8th St/121st Ave SE	No Build	<ul style="list-style-type: none"> <li>• Maintains LOS B operation in 2035</li> </ul>
SE 8th St/LHC	Alternative 1 – Modified Signal	<ul style="list-style-type: none"> <li>• Reduced congestion relieves driver frustration</li> <li>• Cost effective solution for the level of investment</li> </ul>
LHC/Richards Rd	No-Build	<ul style="list-style-type: none"> <li>• Maintains LOS D or better operation in 2035</li> </ul>

## Challenges and Risks

The challenges and risks associated with the recommended alternatives are summarized in Table 18.

**Table 18. Challenges and Risks.**

Location	Recommended Alt.	Challenges and Risks
SE 8th St/121st Ave SE	No Build	<ul style="list-style-type: none"><li>• None.</li></ul>
SE 8th St/LHC	Alternative 1- Modified Signal	<ul style="list-style-type: none"><li>• Several of the approaches including WB SE 7th Place will drop to LOS F in 2035. Even with the signal improvements, the roundabout option will need to be considered in the future if conditions continue to degrade as modeled.</li><li>• Impacts to critical areas are thought to be minor but further investigation is needed to confirm the level of impact.</li></ul>
LHC/Richards Rd	No Build	<ul style="list-style-type: none"><li>• WB and NB left-turn movements will experience significant congestion in 2035 during the PM peak hour.</li></ul>

## Opinion of Probable Construction Costs

The total preliminary opinion of probable construction costs for the preferred alternatives is \$1,400,000. This estimate includes construction costs only.

# APPENDICES

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## APPENDIX A: TRAFFIC COUNTS

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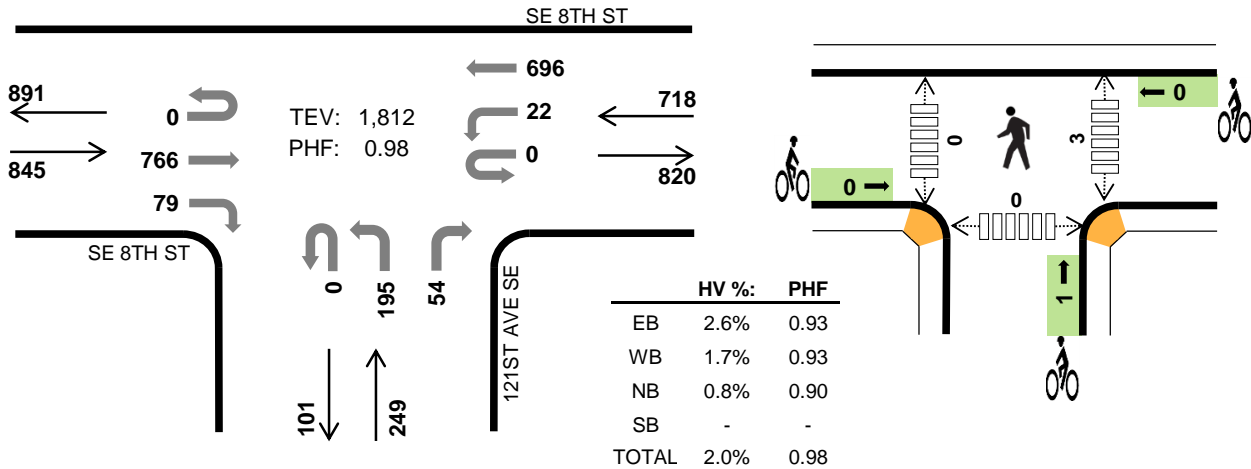


# 121ST AVE SE SE 8TH ST



Peak Hour

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



## Two-Hour Count Summaries

Interval Start	SE 8TH ST Eastbound				SE 8TH ST Westbound				121ST AVE SE Northbound				0 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	138	14	0	5	125	0	0	26	0	5	0	0	0	0	313	0
7:15 AM	0	0	148	15	0	3	179	0	0	52	0	11	0	0	0	0	408	0
7:30 AM	0	0	152	15	0	2	147	0	0	63	0	5	0	0	0	0	384	0
<b>7:45 AM</b>	<b>0</b>	<b>0</b>	<b>214</b>	<b>13</b>	<b>0</b>	<b>3</b>	<b>165</b>	<b>0</b>	<b>0</b>	<b>50</b>	<b>0</b>	<b>19</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>464</b>	1,569
8:00 AM	0	0	195	20	0	8	164	0	0	52	0	16	0	0	0	0	455	1,711
8:15 AM	0	0	196	19	0	7	185	0	0	40	0	7	0	0	0	0	454	1,757
8:30 AM	0	0	161	27	0	4	182	0	0	53	0	12	0	0	0	0	439	1,812
8:45 AM	0	0	143	17	0	9	163	0	0	67	0	17	0	0	0	0	416	1,764
Count Total	0	0	1,347	140	0	41	1,310	0	0	403	0	92	0	0	0	0	3,333	0
Peak Hour	0	0	766	79	0	22	696	0	0	195	0	54	0	0	0	0	1,812	0

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

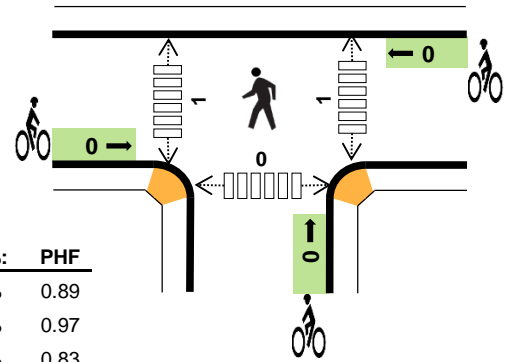
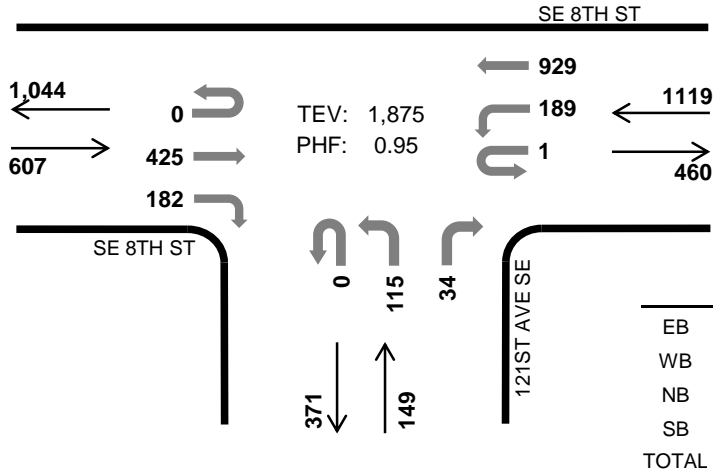
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	8	7	2	0	17	0	0	0	0	0	0	0	0	0	0
7:15 AM	8	8	0	0	16	0	0	0	0	0	0	0	0	0	0
7:30 AM	1	8	2	0	11	0	0	1	0	1	0	0	0	0	0
<b>7:45 AM</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>4</b>
8:00 AM	7	4	0	0	11	0	0	0	0	0	0	0	0	0	0
8:15 AM	5	2	0	0	7	0	0	0	0	0	1	0	1	0	2
8:30 AM	7	3	2	0	12	0	0	0	0	0	0	0	0	0	0
8:45 AM	4	5	2	0	11	0	1	0	0	1	0	0	0	0	0
Count Total	43	40	8	0	91	0	1	2	0	3	3	0	3	0	6
Peak Hr	22	12	2	0	36	0	0	1	0	1	3	0	3	0	6

# 121ST AVE SE SE 8TH ST



Peak Hour

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



	HV %:	PHF
EB	1.2%	0.89
WB	1.2%	0.97
NB	0.7%	0.83
SB	-	-
TOTAL	1.1%	0.95

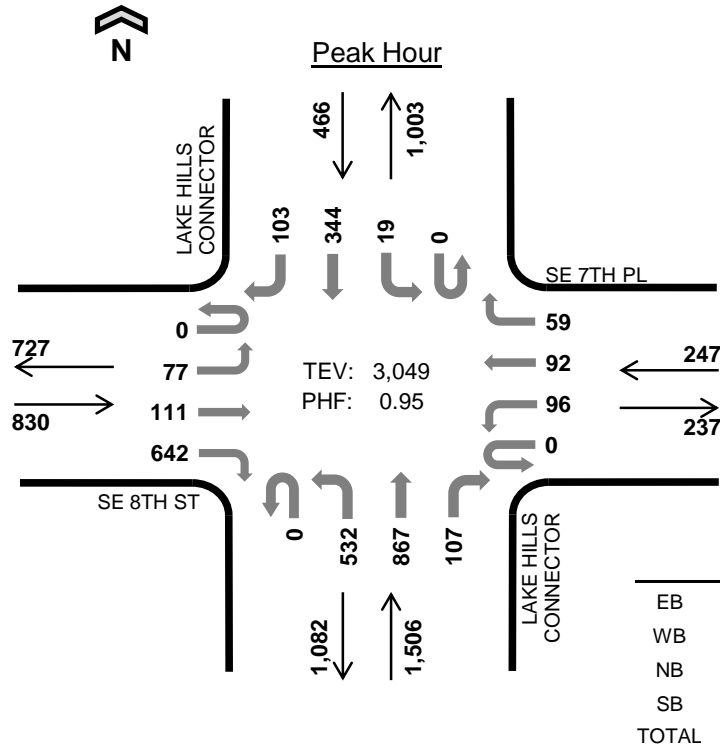
## Two-Hour Count Summaries

Interval Start	SE 8TH ST Eastbound				SE 8TH ST Westbound				121ST AVE SE Northbound				0 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	115	24	0	23	242	0	0	20	0	8	0	0	0	0	432	0
4:15 PM	0	0	102	35	0	35	268	0	0	33	0	7	0	0	0	0	480	0
4:30 PM	0	0	115	29	0	32	235	0	0	19	0	10	0	0	0	0	440	0
4:45 PM	0	0	116	36	1	36	233	0	0	30	0	11	0	0	0	0	463	1,815
5:00 PM	0	0	89	35	0	38	231	0	0	33	0	12	0	0	0	0	438	1,821
5:15 PM	0	0	104	52	0	46	235	0	0	23	0	8	0	0	0	0	468	1,809
5:30 PM	0	0	132	39	0	55	226	0	0	39	0	5	0	0	0	0	496	1,865
5:45 PM	0	0	100	56	1	50	237	0	0	20	0	9	0	0	0	0	473	1,875
Count Total	0	0	873	306	2	315	1,907	0	0	217	0	70	0	0	0	0	3,690	0
Peak Hour	0	0	425	182	1	189	929	0	0	115	0	34	0	0	0	0	1,875	0

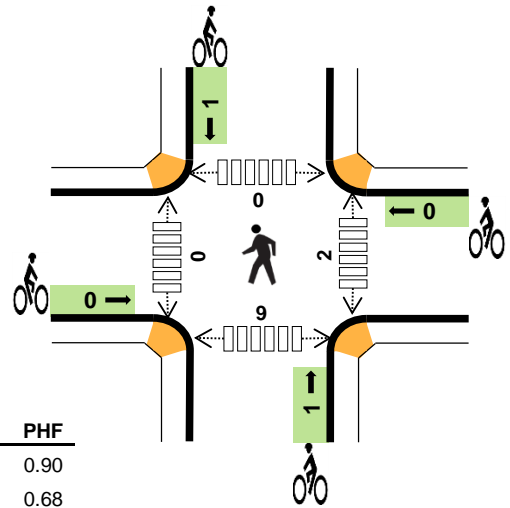
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

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	4	5	1	0	10	1	0	0	0	1	1	0	1	1	3
4:15 PM	5	3	0	0	8	0	0	0	0	0	1	0	1	0	2
4:30 PM	2	5	0	0	7	0	0	0	0	0	2	0	2	0	4
4:45 PM	4	3	1	0	8	1	0	0	0	1	0	0	0	3	3
5:00 PM	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0
5:15 PM	2	3	0	0	5	0	0	0	0	0	0	0	0	0	0
5:30 PM	2	5	0	0	7	0	0	0	0	0	0	1	0	0	1
5:45 PM	2	3	1	0	6	0	0	0	0	0	1	0	1	0	2
Count Total	22	29	3	0	54	2	0	0	0	2	5	1	5	4	15
Peak Hr	7	13	1	0	21	0	0	0	0	0	1	1	1	0	3

# LAKE HILLS CONNECTOR SE 8TH ST



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



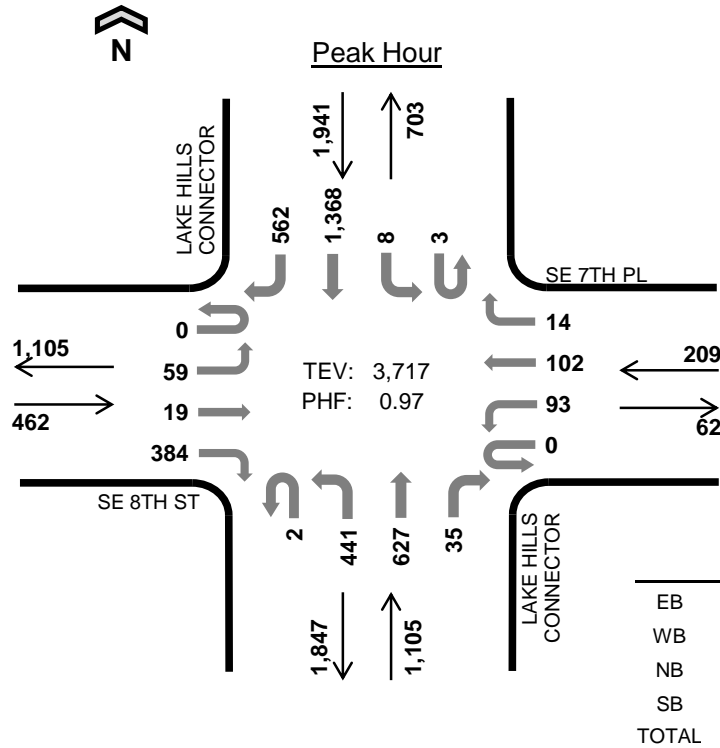
## Two-Hour Count Summaries

Interval Start	SE 8TH ST				SE 7TH PL				LAKE HILLS CONNECTOR				LAKE HILLS CONNECTOR				15-min Total	Rolling One Hour
	Eastbound		Westbound		Westbound		Northbound		Southbound		Southbound		Northbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	7	15	120	0	5	15	5	0	104	152	10	0	1	44	17	495	0
7:15 AM	0	16	9	125	0	7	23	6	1	134	160	10	0	7	63	27	588	0
7:30 AM	0	14	16	136	0	8	17	11	0	120	208	19	0	7	70	20	646	0
<b>7:45 AM</b>	<b>0</b>	<b>16</b>	<b>54</b>	<b>160</b>	<b>0</b>	<b>29</b>	<b>26</b>	<b>18</b>	<b>0</b>	<b>118</b>	<b>207</b>	<b>48</b>	<b>0</b>	<b>12</b>	<b>88</b>	<b>25</b>	<b>801</b>	2,530
8:00 AM	0	22	43	156	0	38	33	20	0	117	190	47	0	6	94	20	786	2,821
8:15 AM	0	21	8	176	0	19	24	13	0	142	193	9	0	0	92	29	726	2,959
8:30 AM	0	18	6	150	0	10	9	8	0	155	277	3	0	1	70	29	736	3,049
8:45 AM	0	23	3	140	0	12	11	1	0	131	218	4	1	0	85	35	664	2,912
Count Total	0	137	154	1,163	0	128	158	82	1	1,021	1,605	150	1	34	606	202	5,442	0
Peak Hour	0	77	111	642	0	96	92	59	0	532	867	107	0	19	344	103	3,049	0

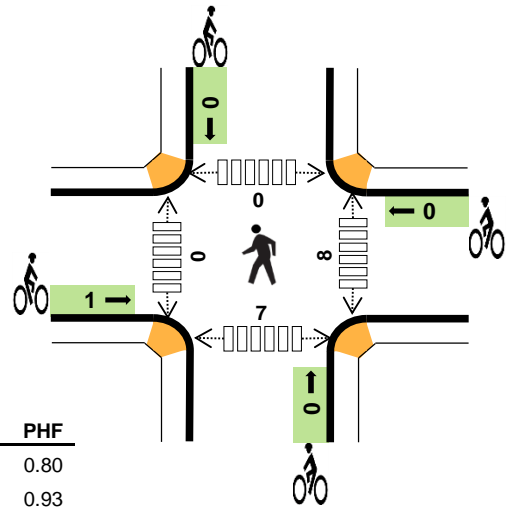
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

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	7	3	7	9	26	0	0	0	0	0	1	0	0	0	1
7:15 AM	7	1	13	3	24	0	0	0	1	1	0	0	0	0	0
7:30 AM	1	2	15	7	25	0	0	0	1	1	0	0	0	1	1
<b>7:45 AM</b>	<b>2</b>	<b>5</b>	<b>15</b>	<b>4</b>	<b>26</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>
8:00 AM	5	2	14	6	27	0	0	0	0	0	2	0	0	1	3
8:15 AM	5	3	4	5	17	0	0	0	0	0	0	0	0	1	1
8:30 AM	4	0	12	7	23	0	0	0	0	0	0	0	0	0	0
8:45 AM	7	1	11	3	22	0	0	1	0	1	2	0	0	0	2
Count Total	38	17	91	44	190	0	0	2	3	5	5	0	0	10	15
Peak Hour	16	10	45	22	93	0	0	1	1	2	2	0	0	9	11

# LAKE HILLS CONNECTOR SE 8TH ST



Date: Tue, Nov 13, 2018  
Count Period: 4:00 PM to 6:00 PM  
Peak Hour: 4:30 PM to 5:30 PM



## Two-Hour Count Summaries

Interval Start	SE 8TH ST				SE 7TH PL				LAKE HILLS CONNECTOR				LAKE HILLS CONNECTOR				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	16	10	114	0	31	35	15	0	127	133	13	0	3	276	131	904	0
4:15 PM	0	9	11	89	0	20	24	7	0	132	153	7	0	4	311	132	899	0
<b>4:30 PM</b>	<b>0</b>	<b>16</b>	<b>2</b>	<b>93</b>	<b>0</b>	<b>30</b>	<b>17</b>	<b>6</b>	<b>0</b>	<b>113</b>	<b>151</b>	<b>7</b>	<b>0</b>	<b>3</b>	<b>354</b>	<b>139</b>	<b>931</b>	<b>0</b>
4:45 PM	0	17	8	119	0	22	29	4	1	123	146	9	1	1	287	120	887	3,621
5:00 PM	0	13	6	74	0	23	31	2	1	81	159	6	2	1	375	165	939	3,656
<b>5:15 PM</b>	<b>0</b>	<b>13</b>	<b>3</b>	<b>98</b>	<b>0</b>	<b>18</b>	<b>25</b>	<b>2</b>	<b>0</b>	<b>124</b>	<b>171</b>	<b>13</b>	<b>0</b>	<b>3</b>	<b>352</b>	<b>138</b>	<b>960</b>	<b>3,717</b>
5:30 PM	0	11	9	120	0	11	20	0	1	132	131	5	0	2	283	130	855	3,641
5:45 PM	0	10	6	93	0	14	16	1	1	127	152	8	0	1	284	154	867	3,621
Count Total	0	105	55	800	0	169	197	37	4	959	1,196	68	3	18	2,522	1,109	7,242	0
<b>Peak Hour</b>	<b>0</b>	<b>59</b>	<b>19</b>	<b>384</b>	<b>0</b>	<b>93</b>	<b>102</b>	<b>14</b>	<b>2</b>	<b>441</b>	<b>627</b>	<b>35</b>	<b>3</b>	<b>8</b>	<b>1,368</b>	<b>562</b>	<b>3,717</b>	<b>0</b>

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

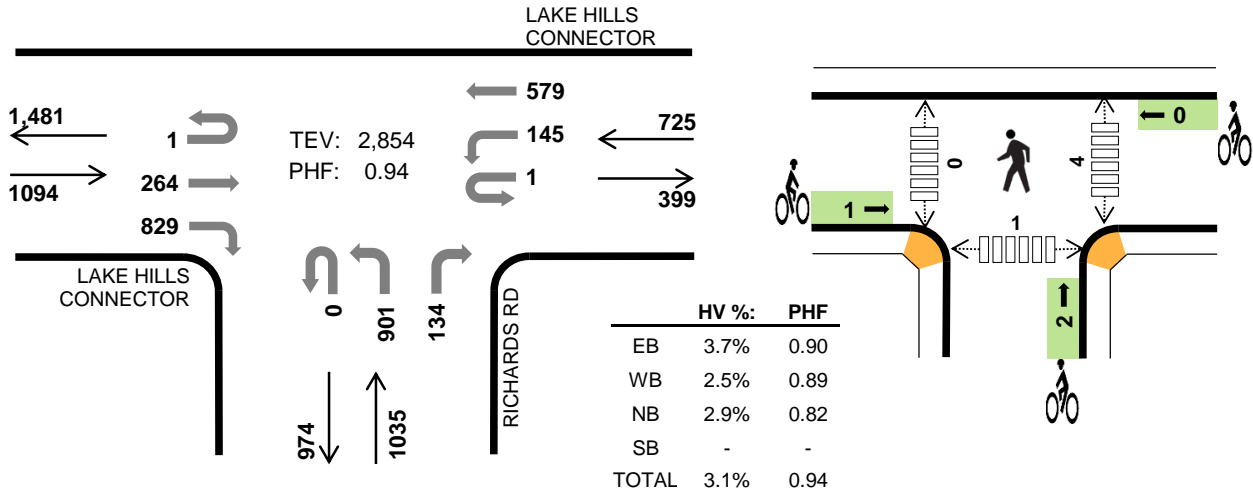
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	4	2	10	6	22	0	0	0	1	1	0	0	0	1	1
4:15 PM	5	0	8	2	15	0	0	1	0	1	1	0	0	1	2
<b>4:30 PM</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>4</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>5</b>
4:45 PM	4	2	6	2	14	1	0	0	0	1	3	0	0	3	6
5:00 PM	1	0	3	4	8	0	0	0	0	0	3	0	0	1	4
<b>5:15 PM</b>	<b>2</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
5:30 PM	2	0	8	7	17	0	0	0	0	0	1	0	0	1	2
5:45 PM	1	0	6	3	10	0	0	0	0	0	0	0	0	0	0
Count Total	20	5	49	32	106	1	0	1	1	3	10	0	0	10	20
<b>Peak Hour</b>	<b>8</b>	<b>3</b>	<b>17</b>	<b>14</b>	<b>42</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>15</b>

# RICHARDS RD LAKE HILLS CONNECTOR



Peak Hour

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



## Two-Hour Count Summaries

Interval Start	LAKE HILLS CONNECTOR				LAKE HILLS CONNECTOR				RICHARDS RD				0				15-min Total	Rolling One Hour
	Eastbound		Westbound		Northbound		Southbound		UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	36	126	0	16	89	0	0	174	0	31	0	0	0	0	472	0
7:15 AM	0	0	56	142	0	15	133	0	0	187	0	32	0	0	0	0	565	0
7:30 AM	0	0	45	156	0	20	138	0	0	234	0	28	0	0	0	0	621	0
<b>7:45 AM</b>	<b>0</b>	<b>0</b>	<b>67</b>	<b>218</b>	<b>0</b>	<b>40</b>	<b>164</b>	<b>0</b>	<b>0</b>	<b>229</b>	<b>0</b>	<b>39</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>757</b>	2,415
8:00 AM	0	0	76	202	0	39	136	0	0	177	0	33	0	0	0	0	663	2,606
8:15 AM	1	0	73	230	1	31	121	0	0	212	0	30	0	0	0	0	699	2,740
8:30 AM	0	0	48	179	0	35	158	0	0	283	0	32	0	0	0	0	735	2,854
8:45 AM	0	0	58	182	0	35	134	0	0	210	0	37	0	0	0	0	656	2,753
Count Total	1	0	459	1,435	1	231	1,073	0	0	1,706	0	262	0	0	0	0	5,168	0
Peak Hour	1	0	264	829	1	145	579	0	0	901	0	134	0	0	0	0	2,854	0

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

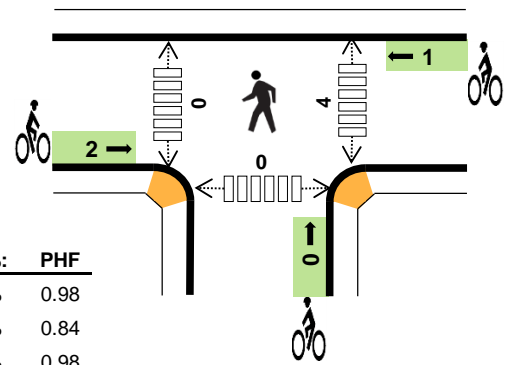
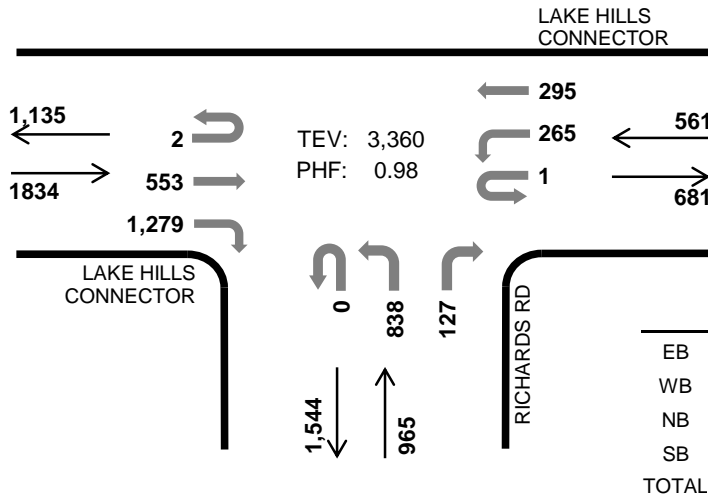
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	14	3	7	0	24	0	0	0	0	0	0	0	0	0	0
7:15 AM	9	3	13	0	25	1	0	0	0	1	0	0	1	0	1
7:30 AM	6	1	15	0	22	1	0	0	0	1	0	0	0	0	0
<b>7:45 AM</b>	<b>7</b>	<b>5</b>	<b>10</b>	<b>0</b>	<b>22</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>
8:00 AM	11	2	9	0	22	0	0	0	0	0	1	0	0	0	1
8:15 AM	12	4	4	0	20	0	0	0	0	0	1	0	0	0	1
8:30 AM	10	7	7	0	24	0	0	0	0	0	1	0	0	1	2
8:45 AM	6	2	12	0	20	0	1	1	0	2	0	0	1	0	1
Count Total	75	27	77	0	179	3	1	3	0	7	4	0	3	1	8
Peak Hr	40	18	30	0	88	1	0	2	0	3	4	0	1	1	6

# RICHARDS RD LAKE HILLS CONNECTOR



Peak Hour

Date: Tue, Nov 13, 2018  
Count Period: 4:00 PM to 6:00 PM  
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	1.0%	0.98
WB	1.6%	0.84
NB	1.3%	0.98
SB	-	-
TOTAL	1.2%	0.98

## Two-Hour Count Summaries

Interval Start	LAKE HILLS CONNECTOR				LAKE HILLS CONNECTOR				RICHARDS RD				0				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	0	130	308	1	39	67	0	0	206	0	36	0	0	0	0	787	0
4:15 PM	0	0	125	272	0	56	81	0	0	209	0	19	0	0	0	0	762	0
<b>4:30 PM</b>	<b>0</b>	<b>0</b>	<b>131</b>	<b>337</b>	<b>0</b>	<b>49</b>	<b>75</b>	<b>0</b>	<b>0</b>	<b>217</b>	<b>0</b>	<b>30</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>839</b>	<b>0</b>
4:45 PM	0	0	144	312	0	64	65	0	0	209	0	31	0	0	0	0	825	3,213
5:00 PM	1	0	147	312	0	69	73	0	0	207	0	33	0	0	0	0	842	3,268
<b>5:15 PM</b>	<b>1</b>	<b>0</b>	<b>131</b>	<b>318</b>	<b>1</b>	<b>83</b>	<b>82</b>	<b>0</b>	<b>0</b>	<b>205</b>	<b>0</b>	<b>33</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>854</b>	<b>3,360</b>
5:30 PM	0	0	130	311	1	74	52	0	0	203	0	27	0	0	0	0	798	3,319
5:45 PM	0	0	126	272	0	62	70	0	0	202	0	32	0	0	0	0	764	3,258
Count Total	2	0	1,064	2,442	3	496	565	0	0	1,658	0	241	0	0	0	0	6,471	0
Peak Hour	2	0	553	1,279	1	265	295	0	0	838	0	127	0	0	0	0	3,360	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	7	5	9	0	21	1	0	0	0	1	0	0	0	0	0
4:15 PM	5	3	4	0	12	1	1	1	0	3	0	0	0	0	0
<b>4:30 PM</b>	<b>5</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>10</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
4:45 PM	5	3	4	0	12	0	1	0	0	1	2	0	2	0	4
5:00 PM	4	3	3	0	10	0	0	0	0	0	1	0	1	0	2
<b>5:15 PM</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>
5:30 PM	7	3	2	0	12	0	0	0	0	0	0	0	1	0	1
5:45 PM	4	2	5	0	11	0	0	0	0	0	0	0	1	0	1
Count Total	41	22	33	0	96	4	2	1	0	7	4	0	6	0	10
Peak Hr	18	9	13	0	40	2	1	0	0	3	4	0	4	0	8



## APPENDIX B: COLLISION DATA

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Date	Year	CoTypeDesc	PossInjuries	NDInjuries	DInjuries	Fatalities	Injury	RoadSurface	LightCondDesc	VehDirLong	VehMovement	StreetName	CrossStreetName	CrossStreetName2	Contrib1CircumDesc	Contrib2CircumDesc	Contrib3CircumDesc
1/23/2013 0:36	2013	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Dark - No Street Lights	Northbound	T	LK HILLS CN	RICHARDS RD	SE 8TH ST	Driver distractions outside of veh		
1/23/2013 0:36	2013	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Dark - No Street Lights	Northbound	T	LK HILLS CN	RICHARDS RD	SE 8TH ST	Driver not distracted		
1/26/2013 18:10	2013	Approach Turn	0	0	0	0	PDO	wet	Dark - Street Lights On	Westbound	LT	SE 8TH ST	121ST AV SE		Did Not Grant R/W to Vehicle		
1/26/2013 18:10	2013	Approach Turn	0	0	0	0	PDO	wet	Dark - Street Lights On	Eastbound	T	SE 8TH ST	121ST AV SE		None		
1/26/2013 18:10	2013	Approach Turn	0	0	0	0	PDO	wet	Dark - Street Lights On	Eastbound	T	SE 8TH ST	121ST AV SE		None		
1/27/2013 17:20	2013	Approach Turn	0	0	0	0	PDO	wet	Dark - Street Lights On	Northbound	LT	SE 8TH ST	LK HILLS CN		Did Not Grant R/W to Vehicle		
1/27/2013 17:20	2013	Approach Turn	0	0	0	0	PDO	wet	Dark - Street Lights On	Southbound	T	SE 8TH ST	LK HILLS CN		None		
2/7/2013 17:51	2013	Rear End	0	0	0	0	PDO	dry	Dark - Street Lights On	Northbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Inattention	Exceeding Reasonable Safe Speed	Unknown driver distraction
2/7/2013 17:51	2013	Rear End	0	0	0	0	PDO	dry	Dark - Street Lights On	Northbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
2/7/2013 17:51	2013	Rear End	0	0	0	0	PDO	dry	Dark - Street Lights On	Northbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
2/7/2013 17:51	2013	Rear End	0	0	0	0	PDO	dry	Dark - Street Lights On	Northbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
2/15/2013 9:11	2013	Right Angle	0	1	0	0	Non-Disabling Injury	dry	Daylight	Northbound	T	LK HILLS CN	RICHARDS RD		Disregard Stop and Go Signal		
2/15/2013 9:11	2013	Right Angle	0	1	0	0	Non-Disabling Injury	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		Driver not distracted		
3/7/2013 14:44	2013	Head On	1	0	0	0	Possible Injury	dry	Daylight	Eastbound	T	SE 8TH ST	121ST AV SE	LK HILLS CN	On Wrong Side of Road		
3/7/2013 14:44	2013	Head On	1	0	0	0	Possible Injury	dry	Daylight	Westbound	T	SE 8TH ST	121ST AV SE	LK HILLS CN	None		
3/23/2013 22:50	2013	Approach Turn	3	0	0	0	Possible Injury	dry	Dark - Street Lights On	Eastbound	T	LK HILLS CN	RICHARDS RD		Inattention	Apparently Fatigued	
3/23/2013 22:50	2013	Approach Turn	3	0	0	0	Possible Injury	dry	Dark - Street Lights On	Westbound	LT	LK HILLS CN	RICHARDS RD		None		
4/2/2013 13:57	2013	Parked Vehicle/Fixed Object	1	0	0	0	Possible Injury	dry	Daylight	Eastbound	RT	LK HILLS CN	RICHARDS RD		Inattention		
4/4/2013 15:12	2013	Approach Turn	0	0	0	0	PDO	wet	Daylight	Northbound	LT	SE 8TH ST	LK HILLS CN		Did Not Grant R/W to Vehicle		
4/4/2013 15:12	2013	Approach Turn	0	0	0	0	PDO	wet	Daylight	Southbound	T	SE 8TH ST	LK HILLS CN		None		
5/14/2013 18:22	2013	Rear End	0	0	0	0	PDO	dry	Daylight	Southbound	T	SE 8TH ST	LK HILLS CN		Inattention		
5/14/2013 18:22	2013	Rear End	0	0	0	0	PDO	dry	Daylight	Southbound	T	SE 8TH ST	LK HILLS CN		None		
5/17/2013 9:26	2013	Rear End	1	0	0	0	Possible Injury	wet	Daylight	Eastbound	T	SE 8TH ST	LK HILLS CN		Inattention		
5/17/2013 9:26	2013	Rear End	1	0	0	0	Possible Injury	wet	Daylight	Eastbound	T	SE 8TH ST	LK HILLS CN		None		
6/11/2013 14:11	2013	Approach Turn	0	0	0	0	PDO	dry	Daylight	Westbound	LT	LK HILLS CN	RICHARDS RD		Disregard Stop and Go Signal		
6/11/2013 14:11	2013	Approach Turn	0	0	0	0	PDO	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
10/8/2013 14:29	2013	Approach Turn	0	0	0	0	PDO	wet	Daylight	Westbound	LT	LK HILLS CN	RICHARDS RD		Disregard Stop and Go Signal		
10/8/2013 14:29	2013	Approach Turn	0	0	0	0	PDO	wet	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
10/18/2013 16:51	2013	Other	0	0	0	0	PDO	dry	Daylight	Southbound	UT	SE 8TH ST	121ST AV SE		Improper U Turn		
10/18/2013 16:51	2013	Other	0	0	0	0	PDO	dry	Daylight	Northbound	T	SE 8TH ST	121ST AV SE		None		
10/28/2013 7:40	2013	Approach Turn	0	2	0	0	Non-Disabling Injury	dry	Daylight	Northbound	LT	SE 8TH ST	LK HILLS CN		Did Not Grant R/W to Vehicle		
10/28/2013 7:40	2013	Approach Turn	0	2	0	0	Non-Disabling Injury	dry	Daylight	Southbound	T	SE 8TH ST	LK HILLS CN		None		
11/5/2013 18:30	2013	Rear End	0	0	0	0	PDO	dry	Dark - Street Lights On	Eastbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Driver not distracted		
11/5/2013 18:30	2013	Rear End	0	0	0	0	PDO	dry	Dark - Street Lights On	Eastbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Driver not distracted		
11/15/2013 6:57	2013	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Dawn	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Other * (List in Narrative)		
11/15/2013 6:57	2013	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Dawn	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
12/4/2013 11:55	2013	Rear End	0	1	0	0	Non-Disabling Injury	dry	Daylight	Eastbound	T	SE 8TH ST	121ST AV SE		Inattention		
12/4/2013 11:55	2013	Rear End	0	1	0	0	Non-Disabling Injury	dry	Daylight	Eastbound	T	SE 8TH ST	121ST AV SE		None		
1/3/2014 13:01	2014	Approach Turn	0	0	0	0	PDO	wet	Daylight	Westbound	LT	LK HILLS CN	RICHARDS RD		Unknown driver distraction		
1/3/2014 13:01	2014	Approach Turn	0	0	0	0	PDO	wet	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
2/8/2014 20:20	2014	Parked Vehicle/Fixed Object	1	0	0	0	Possible Injury	snow/slush	Dark - No Street Lights	Northbound	T	LK HILLS CN	RICHARDS RD	SE 8TH ST	Exceeding Reasonable Safe Speed		
2/20/2014 12:39	2014	Right Angle	1	0	0	0	Possible Injury	dry	Daylight	Eastbound	T	SE 8TH ST	LK HILLS CN		Other * (List in Narrative)		
2/20/2014 12:39	2014	Right Angle	1	0	0	0	Possible Injury	dry	Daylight	Southbound	T	SE 8TH ST	LK HILLS CN		Other * (List in Narrative)		
4/17/2014 12:03	2014	Parked Vehicle/Fixed Object	0	0	0	0	PDO	wet	Daylight	Northbound	T	LK HILLS CN	RICHARDS RD		Inattention	Exceeding Reasonable Safe Speed	
5/14/2014 14:31	2014	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Did Not Grant R/W to Vehicle		
5/14/2014 14:31	2014	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
5/24/2014 22:03	2014	Approach Turn	0	0	0	0	PDO	dry	Dark - Street Lights On	Eastbound	T	LK HILLS CN	RICHARDS RD		Driver not distracted		
5/24/2014 22:03	2014	Approach Turn	0	0	0	0	PDO	dry	Dark - Street Lights On	Westbound	LT	LK HILLS CN	RICHARDS RD		Disregard Stop and Go Signal		
7/9/2014 14:25	2014	Head On	0	0	0	0	PDO	dry	Daylight	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	On Wrong Side of Road	Driver operating other electronic de	Unknown driver distraction
7/9/2014 14:25	2014	Head On	0	0	0	0	PDO	dry	Daylight	Eastbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
7/21/2014 8:33	2014	Approach Turn	0	0	0	0	PDO	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		Other * (List in Narrative)		
7/21/2014 8:33	2014	Approach Turn	0	0	0	0	PDO	dry	Daylight	Westbound	LT	LK HILLS CN	RICHARDS RD		Other * (List in Narrative)		
7/23/2014 14:36	2014	Parked Vehicle/Fixed Object	1	0	0	0	Possible Injury	wet	Daylight	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
7/28/2014 12:32	2014	Rear End	0	0	0	0	PDO	dry	Daylight	Eastbound	RT	LK HILLS CN	RICHARDS RD		Other * (List in Narrative)		
7/28/2014 12:32	2014	Rear End	0	0	0	0	PDO	dry	Daylight	Eastbound	RT	LK HILLS CN	RICHARDS RD		Other * (List in Narrative)		
10/15/2014 7:47	2014	Rear End	0	0	0	0	PDO	wet	Daylight	Northbound	T	LK HILLS CN	RICHARDS RD	SE 8TH ST	Inattention		
10/15/2014 7:47	2014	Rear End	0	0	0	0	PDO	wet	Daylight	Northbound	T	LK HILLS CN	RICHARDS RD	SE 8TH ST	Driver not distracted		
10/15/2014 7:47	2014	Rear End	0	0	0	0	PDO	wet	Daylight	Northbound	T	LK HILLS CN	RICHARDS RD	SE 8TH ST	Driver not distracted		
10/20/2014 8:00	2014	Approach Turn	0	0	0	0	PDO	wet	Daylight	Southbound	LT	SE 8TH ST	LK HILLS CN		Improper Turn	Inattention	
10/20/2014 8:00	2014	Approach Turn	0	0	0	0	PDO	wet	Daylight	Northbound	T	SE 8TH ST	LK HILLS CN		None		
10/22/2014 21:41	2014	Approach Turn	0	0	0	0	PDO	wet	Dark - Street Lights On	Westbound	LT	LK HILLS CN	RICHARDS RD		Improper Turn	Did Not Grant R/W to Vehicle	
10/22/2014 21:41	2014	Approach Turn	0	0	0	0	PDO	wet	Dark - Street Lights On	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
11/18/2014 18:39	2014	Approach Turn	0	0	0	0	PDO	wet	Dark - Street Lights On	Southbound	T	SE 8TH ST	LK HILLS CN		Disregard Stop and Go Signal		
11/18/2014 18:39	2014	Approach Turn	0	0	0	0	PDO	wet	Dark - Street Lights On	Northbound	LT	SE 8TH ST	LK HILLS CN		None		
11/25/2014 7:05	2014	Approach Turn	0	0	0	0	PDO	wet	Daylight	Northbound	LT	SE 8TH ST	LK HILLS CN		Inattention		
11/25/2014 7:05	2014	Approach Turn	0	0	0	0	PDO	wet	Daylight	Southbound	T	SE 8TH ST	LK HILLS CN		None		
12/31/2014 22:03	2014	Approach Turn	0	2	1	0	Disabling Injury	dry	Dark - Street Lights On	Northbound	LT	SE 8TH ST	LK HILLS CN		Improper Turn	Exceeding Reasonable Safe Speed	
12/31/2014 22:03	2014	Approach Turn	0	2	1	0	Disabling Injury	dry	Dark - Street Lights On	Southbound	T	SE 8TH ST	LK HILLS CN		None		
1/21/2015 9:02	2015	Approach Turn	1	0	0	0	Possible Injury	dry	Daylight	Northbound	LT	LK HILLS CN	SE 8TH ST		Did Not Grant R/W to Vehicle		
1/21/2015 9:02	2015	Approach Turn	1	0	0	0	Possible Injury	dry	Daylight	Southbound	T	LK HILLS CN	SE 8TH ST		None		
1/21/2015 9:02	2015	Approach Turn	1	0	0	0	Possible Injury	dry	Daylight	Eastbound	T	LK HILLS CN	SE 8TH ST		None		
1/27/2015 17:00	2015	Sideswipe/Lane Change	0	0	0	0	PDO	wet	Dusk	Northbound	T	LK HILLS CN	RICHARDS RD	SE 8TH ST	Did Not Grant R/W to Vehicle		

Date	Year	ColTypeDesc	PossInjuries	NDInjuries	DInjuries	Fatalities	Injury	RoadSurface	LightCondDesc	VehDirLong	VehMovement	StreetName	CrossStreetName	CrossStreetName2	Contrib1CircumDesc	Contrib2CircumDesc	Contrib3CircumDesc
1/27/2015 17:00	2015	Sideswipe/Lane Change	0	0	0	0	PDO	wet	Dusk	Northbound	T	LK HILLS CN	RICHARDS RD	SE 8TH ST	None		
2/10/2015 9:30	2015	Approach Turn	0	0	0	0	PDO	dry	Daylight	Northbound	LT	SE 8TH ST	LK HILLS CN		Did Not Grant R/W to Vehicle		
2/10/2015 9:30	2015	Approach Turn	0	0	0	0	PDO	dry	Daylight	Southbound	T	SE 8TH ST	LK HILLS CN		None		
2/10/2015 9:30	2015	Approach Turn	0	0	0	0	PDO	dry	Daylight	Eastbound	T	SE 8TH ST	LK HILLS CN		None		
2/17/2015 10:05	2015	Approach Turn	1	0	0	0	Possible Injury	dry	Daylight	Westbound	LT	LK HILLS CN	RICHARDS RD		Did Not Grant R/W to Vehicle		
2/17/2015 10:05	2015	Approach Turn	1	0	0	0	Possible Injury	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
2/24/2015 12:00	2015	Parked Vehicle/Fixed Object	1	0	0	0	Possible Injury	dry	Daylight	Eastbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Other * (List in Narrative)		
3/20/2015 14:21	2015	Rear End	1	1	0	0	Non-Disabling Injury	wet	Daylight	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Did Not Grant R/W to Vehicle		
3/20/2015 14:21	2015	Rear End	1	1	0	0	Non-Disabling Injury	wet	Daylight	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
3/25/2015 13:04	2015	Approach Turn	0	0	0	0	PDO	wet	Daylight	Northbound	LT	LK HILLS CN	SE 8TH ST		Did Not Grant R/W to Vehicle		
3/25/2015 13:04	2015	Approach Turn	0	0	0	0	PDO	wet	Daylight	Southbound	T	LK HILLS CN	SE 8TH ST		None		
3/31/2015 8:06	2015	Approach Turn	0	0	0	0	PDO	wet	Daylight	Northbound	LT	SE 8TH ST	LK HILLS CN		Did Not Grant R/W to Vehicle		
3/31/2015 8:06	2015	Approach Turn	0	0	0	0	PDO	wet	Daylight	Southbound	T	SE 8TH ST	LK HILLS CN		None		
4/7/2015 16:50	2015	Approach Turn	0	0	0	0	PDO	dry	Daylight	Westbound	LT	LK HILLS CN	RICHARDS RD		Improper Turn	Disregard Stop and Go Signal	
4/7/2015 16:50	2015	Approach Turn	0	0	0	0	PDO	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
4/24/2015 17:07	2015	Rear End	1	0	0	0	Possible Injury	dry	Daylight	Northbound	T	LK HILLS CN	RICHARDS RD		Did Not Grant R/W to Vehicle	Following Too Closely	
4/24/2015 17:07	2015	Rear End	1	0	0	0	Possible Injury	dry	Daylight	Northbound	T	LK HILLS CN	RICHARDS RD		None		
5/4/2015 12:03	2015	Approach Turn	1	0	0	0	Possible Injury	dry	Daylight	Westbound	LT	LK HILLS CN	RICHARDS RD		Other * (List in Narrative)		
5/4/2015 12:03	2015	Approach Turn	1	0	0	0	Possible Injury	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		Other * (List in Narrative)		
5/20/2015 14:13	2015	Rear End	1	0	0	0	Possible Injury	dry	Daylight	Eastbound	T	SE 8TH ST	LK HILLS CN		Inattention		
5/20/2015 14:13	2015	Rear End	1	0	0	0	Possible Injury	dry	Daylight	Eastbound	T	SE 8TH ST	LK HILLS CN		None		
6/30/2015 8:29	2015	Approach Turn	0	0	0	0	PDO	dry	Daylight	Westbound	LT	LK HILLS CN	RICHARDS RD		Disregard Stop and Go Signal		
6/30/2015 8:29	2015	Approach Turn	0	0	0	0	PDO	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
7/16/2015 15:24	2015	Approach Turn	0	0	0	0	PDO	dry	Daylight	Northbound	LT	SE 8TH ST	LK HILLS CN		Did Not Grant R/W to Vehicle		
7/16/2015 15:24	2015	Approach Turn	0	0	0	0	PDO	dry	Daylight	Southbound	T	SE 8TH ST	LK HILLS CN		None		
8/7/2015 7:00	2015	Right Angle	0	0	0	0	PDO	dry	Daylight	Northbound	T	LK HILLS CN	RICHARDS RD		Other * (List in Narrative)		
8/7/2015 7:00	2015	Right Angle	0	0	0	0	PDO	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
8/8/2015 12:28	2015	Approach Turn	1	1	0	0	Non-Disabling Injury	dry	Daylight	Westbound	LT	LK HILLS CN	RICHARDS RD		None		
8/8/2015 12:28	2015	Approach Turn	1	1	0	0	Non-Disabling Injury	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
8/14/2015 18:26	2015	Approach Turn	0	0	0	0	PDO	wet	Daylight	Westbound	LT	LK HILLS CN	RICHARDS RD		Disregard Stop and Go Signal		
8/14/2015 18:26	2015	Approach Turn	0	0	0	0	PDO	wet	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
8/14/2015 21:07	2015	Approach Turn	1	0	0	0	Possible Injury	wet	Daylight	Westbound	LT	LK HILLS CN	RICHARDS RD		Other * (List in Narrative)		
8/14/2015 21:07	2015	Approach Turn	1	0	0	0	Possible Injury	wet	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
8/23/2015 16:38	2015	Approach Turn	0	0	0	0	PDO	dry	Daylight	Westbound	LT	LK HILLS CN	RICHARDS RD		Did Not Grant R/W to Vehicle		
8/23/2015 16:38	2015	Approach Turn	0	0	0	0	PDO	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
8/23/2015 23:22	2015	Parked Vehicle/Fixed Object	0	0	0	0	PDO	dry	Dark - Street Lights On	Southbound	RT	SE 8TH ST	LK HILLS CN		Inattention	Driver interacting w/ pass, pet, or objects	
8/29/2015 23:46	2015	Approach Turn	1	0	0	0	Possible Injury	wet	Dark - No Street Lights	Eastbound	RT	LK HILLS CN	RICHARDS RD		Inattention		
8/29/2015 23:46	2015	Approach Turn	1	0	0	0	Possible Injury	wet	Dark - No Street Lights	Westbound	T	LK HILLS CN	RICHARDS RD		None		
10/9/2015 12:37	2015	Rear End	1	0	0	0	Possible Injury	wet	Daylight	Westbound	T	SE 8TH ST	121ST AV SE		Inattention		
10/9/2015 12:37	2015	Rear End	1	0	0	0	Possible Injury	wet	Daylight	Westbound	T	SE 8TH ST	121ST AV SE		None		
11/25/2015 12:39	2015	Rear End	0	0	0	0	PDO	dry	Daylight	Northbound	T	SE 8TH ST	LK HILLS CN		Following Too Closely		
11/25/2015 12:39	2015	Rear End	0	0	0	0	PDO	dry	Daylight	Northbound	T	SE 8TH ST	LK HILLS CN		None		
12/2/2015 8:49	2015	Right Angle	1	0	0	0	Possible Injury	dry	Daylight	Southbound	T	SE 8TH ST	LK HILLS CN		Disregard Stop and Go Signal		
12/2/2015 8:49	2015	Right Angle	1	0	0	0	Possible Injury	dry	Daylight	Eastbound	T	SE 8TH ST	LK HILLS CN		None		
12/14/2015 10:32	2015	Parked Vehicle/Fixed Object	0	0	0	0	PDO	wet	Daylight	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Inattention		
12/15/2015 18:33	2015	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Dark - Street Lights On	Eastbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Inattention	Failing to Signal	
12/15/2015 18:33	2015	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Dark - Street Lights On	Eastbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
12/18/2015 15:20	2015	Sideswipe/Lane Change	0	0	0	0	PDO	wet	Daylight	Northbound	T	LK HILLS CN	RICHARDS RD		Did Not Grant R/W to Vehicle		
12/18/2015 15:20	2015	Sideswipe/Lane Change	0	0	0	0	PDO	wet	Daylight	Northbound	T	LK HILLS CN	RICHARDS RD		None		
12/23/2015 19:22	2015	Parked Vehicle/Fixed Object	0	0	0	0	PDO	wet	Dark - No Street Lights	Eastbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Inattention	Exceeding Reasonable Safe Speed	
1/6/2016 17:15	2016	Sideswipe/Lane Change	0	0	0	0	PDO	wet	Dark - No Street Lights	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Inattention	Did Not Grant R/W to Vehicle	Over Center Line
1/6/2016 17:15	2016	Sideswipe/Lane Change	0	0	0	0	PDO	wet	Dark - No Street Lights	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
1/15/2016 18:59	2016	Rear End	0	0	0	0	PDO	wet	Dark - Street Lights On	Westbound	T	LK HILLS CN	RICHARDS RD		Other * (List in Narrative)		
1/15/2016 18:59	2016	Rear End	0	0	0	0	PDO	wet	Dark - Street Lights On	Westbound	T	LK HILLS CN	RICHARDS RD		None		
1/22/2016 16:46	2016	Rear End	0	0	0	0	PDO	dry	Dusk	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Exceeding Reasonable Safe Speed		
1/22/2016 16:46	2016	Rear End	0	0	0	0	PDO	dry	Dusk	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
5/22/2016 11:39	2016	Right Angle	0	0	0	0	PDO	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		Exceeding Reasonable Safe Speed	Disregard Stop and Go Signal	
5/22/2016 11:39	2016	Right Angle	0	0	0	0	PDO	dry	Daylight	Northbound	T	LK HILLS CN	RICHARDS RD		Driver not distracted		
6/4/2016 17:53	2016	Parked Vehicle/Fixed Object	0	0	0	1	Disabling Injury	dry	Daylight	Eastbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Exceeding Reasonable Safe Speed		
6/17/2016 6:08	2016	Approach Turn	0	0	0	0	PDO	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		Other * (List in Narrative)		
6/17/2016 6:08	2016	Approach Turn	0	0	0	0	PDO	dry	Daylight	Westbound	LT	LK HILLS CN	RICHARDS RD		Other * (List in Narrative)		
6/24/2016 16:43	2016	Other	1	0	0	0	Possible Injury	dry	Daylight	Westbound	UT	LK HILLS CN	RICHARDS RD		Inattention		
6/24/2016 16:43	2016	Other	1	0	0	0	Possible Injury	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
6/24/2016 16:43	2016	Other	1	0	0	0	Possible Injury	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
7/28/2016 17:41	2016	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Northbound	T	LK HILLS CN	RICHARDS RD		None		
7/28/2016 17:41	2016	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Northbound	T	LK HILLS CN	RICHARDS RD		Did Not Grant R/W to Vehicle		
8/9/2016 13:22	2016	Approach Turn	1	1	0	0	Non-Disabling Injury	dry	Daylight	Westbound	LT	LK HILLS CN	RICHARDS RD		Disregard Stop and Go Signal		
8/9/2016 13:22	2016	Approach Turn	1	1	0	0	Non-Disabling Injury	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
9/6/2016 14:30	2016	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Northbound	LT	LK HILLS CN	RICHARDS RD		Other * (List in Narrative)		
9/6/2016 14:30	2016	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Northbound	LT	LK HILLS CN	RICHARDS RD		Other * (List in Narrative)		
10/3/2016 12:30	2016	Pedestrian	1	0	0	0	Possible Injury	dry	Daylight	Westbound	LT	SE 8TH ST	LK HILLS CN		Did Not Grant R/W to Pedestrian/Pedalcyclist		
10/3/2016 12:30	2016	Pedestrian	1	0	0	0	Possible Injury	dry	Daylight	Westbound	T	SE 8TH ST	LK HILLS CN		None		

Date	Year	CoTypeDesc	PossInjuries	NDInjuries	DInjuries	Fatalities	Injury	RoadSurface	LightCondDesc	VehDirLong	VehMovement	StreetName	CrossStreetName	CrossStreetName2	Contrib1CircumDesc	Contrib2CircumDesc	Contrib3CircumDesc
10/10/2016 11:13	2016	Right Angle	0	0	0	0	PDO	wet	Daylight	Eastbound	T	SE 8TH ST	LK HILLS CN		Unknown driver distraction		
10/10/2016 11:13	2016	Right Angle	0	0	0	0	PDO	wet	Daylight	Southbound	T	SE 8TH ST	LK HILLS CN		None		
10/13/2016 11:39	2016	Rear End	0	0	0	0	PDO	wet	Daylight	Northbound	T	RICHARDS RD	LK HILLS CN		Exceeding Reasonable Safe Speed		
10/13/2016 11:39	2016	Rear End	0	0	0	0	PDO	wet	Daylight	Northbound	T	RICHARDS RD	LK HILLS CN		None		
10/13/2016 11:39	2016	Sideswipe/Lane Change	0	0	0	0	PDO	wet	Daylight	Northbound	T	LK HILLS CN	RICHARDS RD		Exceeding Reasonable Safe Speed		
10/13/2016 11:39	2016	Sideswipe/Lane Change	0	0	0	0	PDO	wet	Daylight	Northbound	T	LK HILLS CN	RICHARDS RD		None		
11/5/2016 10:28	2016	Rear End	0	0	0	0	PDO	wet	Daylight	Westbound	T	LK HILLS CN	RICHARDS RD		Inattention	Exceeding Reasonable Safe Speed	
11/5/2016 10:28	2016	Rear End	0	0	0	0	PDO	wet	Daylight	Westbound	T	LK HILLS CN	RICHARDS RD		None		
12/18/2016 18:29	2016	Rear End	0	0	0	0	PDO	dry	Dark - Street Lights On	Westbound	T	SE 8TH ST	121ST AV SE		Unknown driver distraction		
12/18/2016 18:29	2016	Rear End	0	0	0	0	PDO	dry	Dark - Street Lights On	Westbound	T	SE 8TH ST	121ST AV SE		Operating Defective Equipment	Driver not distracted	
12/19/2016 10:43	2016	Right Angle	1	0	0	0	Possible Injury	wet	Daylight	Westbound	T	SE 8TH ST	LK HILLS CN		Disregard Stop and Go Signal		
12/19/2016 10:43	2016	Right Angle	1	0	0	0	Possible Injury	wet	Daylight	Southbound	T	SE 8TH ST	LK HILLS CN		None		
12/30/2016 11:18	2016	Other	0	0	0	0	PDO	dry	Daylight	Westbound	UT	SE 8TH ST	121ST AV SE	LK HILLS CN	Improper U Turn		
12/30/2016 11:18	2016	Other	0	0	0	0	PDO	dry	Daylight	Westbound	T	SE 8TH ST	121ST AV SE	LK HILLS CN	None		
1/31/2017 18:03	2017	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Dark - No Street Lights	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Did Not Grant R/W to Vehicle	Unknown driver distraction	
1/31/2017 18:03	2017	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Dark - No Street Lights	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
2/17/2017 16:23	2017	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Following Too Closely		
2/17/2017 16:23	2017	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
4/6/2017 12:59	2017	Right Angle	1	0	0	0	Possible Injury	wet	Daylight	Northbound	T	LK HILLS CN	RICHARDS RD		On Wrong Side of Road	Exceeding Reasonable Safe Speed	Unknown driver distraction
4/6/2017 12:59	2017	Right Angle	1	0	0	0	Possible Injury	wet	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
5/1/2017 18:01	2017	Parked Vehicle/Fixed Object	0	0	0	0	PDO	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		Under Influence of Alcohol		
5/23/2017 18:30	2017	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Westbound	T	SE 8TH ST	121ST AV SE		On Wrong Side of Road		
5/23/2017 18:30	2017	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Westbound	LT	SE 8TH ST	121ST AV SE		None		
7/6/2017 7:48	2017	Approach Turn	0	1	0	0	Non-Disabling Injury	dry	Daylight	Southbound	T	SE 8TH ST	LK HILLS CN		Disregard Stop and Go Signal		
7/6/2017 7:48	2017	Approach Turn	0	1	0	0	Non-Disabling Injury	dry	Daylight	Northbound	LT	SE 8TH ST	LK HILLS CN		None		
7/8/2017 15:19	2017	Approach Turn	1	0	0	0	Possible Injury	dry	Daylight	Westbound	LT	LK HILLS CN	RICHARDS RD		Unknown driver distraction		
7/8/2017 15:19	2017	Approach Turn	1	0	0	0	Possible Injury	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
7/12/2017 13:50	2017	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Did Not Grant R/W to Vehicle		
7/12/2017 13:50	2017	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Driver not distracted		
7/14/2017 21:02	2017	Right Angle	2	0	0	0	Possible Injury	dry	Dark - Street Lights On	Northbound	T	LK HILLS CN	RICHARDS RD		Did Not Grant R/W to Vehicle		
7/14/2017 21:02	2017	Right Angle	2	0	0	0	Possible Injury	dry	Dark - Street Lights On	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
7/22/2017 10:04	2017	Rear End	0	0	0	0	PDO	dry	Daylight	Northbound	T	SE 8TH ST	LK HILLS CN		Inattention		
7/22/2017 10:04	2017	Rear End	0	0	0	0	PDO	dry	Daylight	Northbound	T	SE 8TH ST	LK HILLS CN		None		
9/11/2017 14:10	2017	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Southbound	T	SE 8TH ST	LK HILLS CN		Did Not Grant R/W to Vehicle		
9/11/2017 14:10	2017	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Southbound	T	SE 8TH ST	LK HILLS CN		None		
9/24/2017 17:45	2017	Rear End	0	1	0	0	Non-Disabling Injury	dry	Daylight	Eastbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Under Influence of Alcohol	Inattention	Exceeding Reasonable Safe Speed
9/24/2017 17:45	2017	Rear End	0	1	0	0	Non-Disabling Injury	dry	Daylight	Eastbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
9/24/2017 17:45	2017	Rear End	0	1	0	0	Non-Disabling Injury	dry	Daylight	Eastbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
9/26/2017 6:15	2017	Right Angle	0	0	0	0	PDO	dry	Dark - Street Lights On	Eastbound	T	LK HILLS CN	RICHARDS RD		Disregard Stop and Go Signal		
9/26/2017 6:15	2017	Right Angle	0	0	0	0	PDO	dry	Dark - Street Lights On	Northbound	T	LK HILLS CN	RICHARDS RD		None		
10/25/2017 11:10	2017	Parked Vehicle/Fixed Object	0	0	0	0	PDO	wet	Daylight	Eastbound	RT	LK HILLS CN	RICHARDS RD		Exceeding Stated Speed Limit		
11/13/2017 16:54	2017	Sideswipe/Lane Change	0	0	0	0	PDO	wet	Dark - No Street Lights	Eastbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Did Not Grant R/W to Vehicle		
11/13/2017 16:54	2017	Sideswipe/Lane Change	0	0	0	0	PDO	wet	Dark - No Street Lights	Eastbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
11/21/2017 17:42	2017	Rear End	0	0	0	0	PDO	wet	Dark - No Street Lights	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Inattention	Unknown driver distraction	Following Too Closely
11/21/2017 17:42	2017	Rear End	0	0	0	0	PDO	wet	Dark - No Street Lights	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
12/5/2017 16:31	2017	Rear End	1	0	0	0	Possible Injury	dry	Dark - Street Lights On	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Exceeding Reasonable Safe Speed	Driver eating or drinking	
12/5/2017 16:31	2017	Rear End	1	0	0	0	Possible Injury	dry	Dark - Street Lights On	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
12/5/2017 16:31	2017	Rear End	1	0	0	0	Possible Injury	dry	Dark - Street Lights On	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	None		
12/21/2017 22:50	2017	Parked Vehicle/Fixed Object	1	0	0	0	Possible Injury	wet	Dark - No Street Lights	Eastbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Other * (List in Narrative)		
1/12/2018 18:10	2018	Sideswipe/Lane Change	1	0	0	0	Possible Injury	wet	Dark - Street Lights On	Eastbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Driver not distracted		
1/12/2018 18:10	2018	Sideswipe/Lane Change	1	0	0	0	Possible Injury	wet	Dark - Street Lights On	Eastbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Did Not Grant R/W to Vehicle		
2/14/2018 12:37	2018	Rear End	0	0	0	0	PDO	wet	Daylight	Northbound	T	SE 8TH ST	LK HILLS CN		Exceeding Reasonable Safe Speed		
2/14/2018 12:37	2018	Rear End	0	0	0	0	PDO	wet	Daylight	Northbound	T	SE 8TH ST	LK HILLS CN		None		
3/9/2018 6:53	2018	Pedestrian	0	1	0	0	Non-Disabling Injury	dry	Daylight	Eastbound	RT	SE 8TH ST	LK HILLS CN		Did Not Grant R/W to Pedestrian/Pedalcyclist		
3/9/2018 6:53	2018	Pedestrian	0	1	0	0	Non-Disabling Injury	dry	Daylight	Eastbound	T	SE 8TH ST	LK HILLS CN		None		
3/20/2018 12:01	2018	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Southbound	T	SE 8TH ST	LK HILLS CN		Unknown driver distraction		
3/20/2018 12:01	2018	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Southbound	T	SE 8TH ST	LK HILLS CN		Unknown driver distraction		
5/11/2018 20:43	2018	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Southbound	RT	SE 8TH ST	LK HILLS CN		Did Not Grant R/W to Vehicle		
5/11/2018 20:43	2018	Sideswipe/Lane Change	0	0	0	0	PDO	dry	Daylight	Southbound	LT	SE 8TH ST	LK HILLS CN		None		
5/15/2018 19:01	2018	Approach Turn	0	0	0	0	PDO	dry	Daylight	Northbound	LT	LK HILLS CN	RICHARDS RD		Other * (List in Narrative)		
5/15/2018 19:01	2018	Approach Turn	0	0	0	0	PDO	dry	Daylight	Southbound	T	LK HILLS CN	RICHARDS RD		None		
6/5/2018 8:08	2018	Parked Vehicle/Fixed Object	0	1	0	0	Non-Disabling Injury	dry	Daylight	Westbound	T	LK HILLS CN	SE 8TH ST	RICHARDS RD	Under Influence of Drugs	Over Center Line	
6/28/2018 13:39	2018	Approach Turn	1	0	0	0	Possible Injury	dry	Daylight	Westbound	LT	LK HILLS CN	RICHARDS RD		Improper Turn	Inattention	
6/28/2018 13:39	2018	Approach Turn	1	0	0	0	Possible Injury	dry	Daylight	Eastbound	T	LK HILLS CN	RICHARDS RD		None		
6/30/2018 16:16	2018	Rear End	1	0	0	0	Possible Injury	wet	Daylight	Northbound	T	SE 8TH ST	LK HILLS CN		Exceeding Reasonable Safe Speed		
6/30/2018 16:16	2018	Rear End	1	0	0	0	Possible Injury	wet	Daylight	Northbound	T	SE 8TH ST	LK HILLS CN		None		





## APPENDIX C: TRAFFIC ANALYSIS

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Lanes, Volumes, Timings  
106: 121st & SE 8th St

05/28/2019



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↙	↗
Traffic Volume (vph)	776	79	23	704	195	54
Future Volume (vph)	776	79	23	704	195	54
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	130		0	85
Storage Lanes		0	1		1	1
Taper Length (ft)			100		25	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Ped Bike Factor						0.98
Frt	0.986					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3456	0	1770	3539	1787	1599
Flt Permitted			0.245		0.950	
Satd. Flow (perm)	3456	0	456	3539	1787	1569
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	9					58
Link Speed (mph)	35			35	25	
Link Distance (ft)	729			908	353	
Travel Time (s)	14.2			17.7	11.8	
Confl. Peds. (#/hr)						3
Confl. Bikes (#/hr)						1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.90	0.90
Heavy Vehicles (%)	3%	3%	2%	2%	1%	1%
Adj. Flow (vph)	834	85	25	757	217	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	919	0	25	757	217	60
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
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)		9	15		15	9
Number of Detectors	2		1	3	2	0
Detector Template						
Leading Detector (ft)	126		37	296	100	0
Trailing Detector (ft)	2		2	2	2	0
Detector 1 Position(ft)	2		2	2	2	2
Detector 1 Size(ft)	20		35	20	20	6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)	120			115	94	
Detector 2 Size(ft)	6			6	6	
Detector 2 Type	Cl+Ex			Cl+Ex	Cl+Ex	
Detector 2 Channel						

Lanes, Volumes, Timings  
106: 121st & SE 8th St

05/28/2019



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector 2 Extend (s)	0.0			0.0	0.0	
Detector 3 Position(ft)				290		
Detector 3 Size(ft)				6		
Detector 3 Type				Cl+Ex		
Detector 3 Channel						
Detector 3 Extend (s)				0.0		
Turn Type	NA		D.P+P	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases			6			4
Detector Phase	6		5	2	4	4
Switch Phase						
Minimum Initial (s)	7.0		5.0	7.0	5.0	5.0
Minimum Split (s)	17.0		10.0	12.0	22.5	22.5
Total Split (s)	39.5		34.0	73.5	46.5	46.5
Total Split (%)	32.9%		28.3%	61.3%	38.8%	38.8%
Maximum Green (s)	34.5		29.0	68.5	42.0	42.0
Yellow Time (s)	4.0		4.0	4.0	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0		3.0	3.0	2.5	2.5
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.0		2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0		2.0	2.0	2.0	2.0
Time Before Reduce (s)	0.0		0.0	0.0	0.0	0.0
Time To Reduce (s)	5.0		5.0	5.0	5.0	5.0
Recall Mode	C-Max		None	C-Max	None	None
Walk Time (s)	5.0				5.0	5.0
Flash Dont Walk (s)	7.0				13.0	13.0
Pedestrian Calls (#/hr)	0				2	2
Act Effect Green (s)	72.9		91.5	93.3	21.2	21.2
Actuated g/C Ratio	0.61		0.76	0.78	0.18	0.18
v/c Ratio	0.44		0.04	0.28	0.69	0.18
Control Delay	14.5		4.6	4.5	57.1	11.4
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	14.5		4.6	4.5	57.1	11.4
LOS	B		A	A	E	B
Approach Delay	14.5			4.5	47.2	
Approach LOS	B			A	D	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	14 (12%), Referenced to phase 2:WBT and 6:EBWB, Start of Red
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.69
Intersection Signal Delay:	15.1
Intersection LOS:	B

Lanes, Volumes, Timings  
 106: 121st & SE 8th St

05/28/2019

Intersection Capacity Utilization 41.8% ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 106: 121st & SE 8th St



Lanes, Volumes, Timings  
106: 121st & SE 8th St

05/28/2019



Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↙	↑↑	↙	↗
Traffic Volume (vph)	427	182	1	189	993	115	34
Future Volume (vph)	427	182	1	189	993	115	34
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		130		0	85
Storage Lanes		0		1		1	1
Taper Length (ft)				100		25	
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	1.00	1.00
Ped Bike Factor						1.00	0.99
Frt	0.955						0.850
Flt Protected				0.950		0.950	
Satd. Flow (prot)	3413	0	0	1787	3574	1787	1599
Flt Permitted				0.358		0.950	
Satd. Flow (perm)	3413	0	0	673	3574	1783	1576
Right Turn on Red		Yes					Yes
Satd. Flow (RTOR)	89						41
Link Speed (mph)	35				35	25	
Link Distance (ft)	729				908	353	
Travel Time (s)	14.2				17.7	11.8	
Confl. Peds. (#/hr)						1	1
Peak Hour Factor	0.89	0.89	0.97	0.97	0.97	0.83	0.83
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	480	204	1	195	1024	139	41
Shared Lane Traffic (%)							
Lane Group Flow (vph)	684	0	0	196	1024	139	41
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	12				12	12	
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	1.00
Turning Speed (mph)		9	9	15		15	9
Number of Detectors	2		2	1	3	2	0
Detector Template							
Leading Detector (ft)	126		100	37	296	100	0
Trailing Detector (ft)	2		2	2	2	2	0
Detector 1 Position(ft)	2		2	2	2	2	2
Detector 1 Size(ft)	20		6	35	20	20	6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	120		94		115	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	



Lanes, Volumes, Timings  
106: 121st & SE 8th St

05/28/2019



Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Detector 3 Position(ft)	290						
Detector 3 Size(ft)	6						
Detector 3 Type	Cl+Ex						
Detector 3 Channel							
Detector 3 Extend (s)	0.0						
Turn Type	NA	custom	D,P+P	NA	Prot	Perm	
Protected Phases	6			5	2	4	
Permitted Phases			5	6			4
Detector Phase	6		5	5	2	4	4
Switch Phase							
Minimum Initial (s)	7.0		5.0	5.0	7.0	5.0	5.0
Minimum Split (s)	17.0		10.0	10.0	12.0	22.5	22.5
Total Split (s)	80.0		20.0	20.0	100.0	30.0	30.0
Total Split (%)	61.5%		15.4%	15.4%	76.9%	23.1%	23.1%
Maximum Green (s)	75.0		15.0	15.0	95.0	25.5	25.5
Yellow Time (s)	4.0		4.0	4.0	4.0	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0			-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0			3.0	3.0	2.5	2.5
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Vehicle Extension (s)	2.0		2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0		2.0	2.0	2.0	2.0	2.0
Time Before Reduce (s)	0.0		0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	5.0		5.0	5.0	5.0	5.0	5.0
Recall Mode	C-Max		None	None	C-Max	None	None
Walk Time (s)	5.0					5.0	5.0
Flash Dont Walk (s)	7.0					13.0	13.0
Pedestrian Calls (#/hr)	0					1	1
Act Effct Green (s)	88.0			105.0	108.0	16.5	16.5
Actuated g/C Ratio	0.68			0.81	0.83	0.13	0.13
v/c Ratio	0.29			0.28	0.34	0.62	0.17
Control Delay	7.7			6.7	5.3	64.9	15.4
Queue Delay	0.0			0.0	0.0	0.0	0.0
Total Delay	7.7			6.7	5.3	64.9	15.4
LOS	A			A	A	E	B
Approach Delay	7.7				5.5	53.6	
Approach LOS	A				A	D	

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	115 (88%), Referenced to phase 2:WBT and 6:EBWB, Start of Red
Natural Cycle:	50
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.62
Intersection Signal Delay:	10.4
Intersection Capacity Utilization	44.8%
Intersection LOS:	B
ICU Level of Service	A

Analysis Period (min) 15

Splits and Phases: 106: 121st & SE 8th St



Lanes, Volumes, Timings  
106: 121st & SE 8th St

05/28/2019



Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↙	↑↑	↙	↗
Traffic Volume (vph)	920	80	1	20	810	240	60
Future Volume (vph)	920	80	1	20	810	240	60
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		130		0	85
Storage Lanes		0		1		1	1
Taper Length (ft)				100		25	
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	1.00	1.00
Ped Bike Factor						1.00	0.99
Frt	0.988						0.850
Flt Protected				0.950		0.950	
Satd. Flow (prot)	3531	0	0	1787	3574	1787	1599
Flt Permitted				0.163		0.950	
Satd. Flow (perm)	3531	0	0	307	3574	1784	1577
Right Turn on Red		Yes					Yes
Satd. Flow (RTOR)	8						52
Link Speed (mph)	35				35	25	
Link Distance (ft)	729				908	353	
Travel Time (s)	14.2				17.7	11.8	
Confl. Peds. (#/hr)						1	1
Peak Hour Factor	0.89	0.89	0.97	0.97	0.97	0.83	0.83
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	1034	90	1	21	835	289	72
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1124	0	0	22	835	289	72
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	12				12	12	
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	1.00
Turning Speed (mph)		9	9	15		15	9
Number of Detectors	2		2	1	3	2	0
Detector Template							
Leading Detector (ft)	126		100	37	296	100	0
Trailing Detector (ft)	2		2	2	2	2	0
Detector 1 Position(ft)	2		2	2	2	2	2
Detector 1 Size(ft)	20		6	35	20	20	6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	120		94		115	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	

Lanes, Volumes, Timings  
106: 121st & SE 8th St

05/28/2019



Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Detector 3 Position(ft)							290
Detector 3 Size(ft)							6
Detector 3 Type							Cl+Ex
Detector 3 Channel							
Detector 3 Extend (s)							0.0
Turn Type	NA	custom	D,P+P	NA	Prot	Perm	
Protected Phases	6			5	2	4	
Permitted Phases			5	6			4
Detector Phase	6		5	5	2	4	4
Switch Phase							
Minimum Initial (s)	7.0		5.0	5.0	7.0	5.0	5.0
Minimum Split (s)	17.0		10.0	10.0	12.0	22.5	22.5
Total Split (s)	39.5		34.0	34.0	73.5	46.5	46.5
Total Split (%)	32.9%		28.3%	28.3%	61.3%	38.8%	38.8%
Maximum Green (s)	34.5		29.0	29.0	68.5	42.0	42.0
Yellow Time (s)	4.0		4.0	4.0	4.0	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0			-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0			3.0	3.0	2.5	2.5
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Vehicle Extension (s)	2.0		2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0		2.0	2.0	2.0	2.0	2.0
Time Before Reduce (s)	0.0		0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	5.0		5.0	5.0	5.0	5.0	5.0
Recall Mode	C-Max		None	None	C-Max	None	None
Walk Time (s)	5.0					5.0	5.0
Flash Dont Walk (s)	7.0					13.0	13.0
Pedestrian Calls (#/hr)	0					2	2
Act Effct Green (s)	67.8			86.4	88.2	26.3	26.3
Actuated g/C Ratio	0.56			0.72	0.74	0.22	0.22
v/c Ratio	0.56			0.05	0.32	0.74	0.19
Control Delay	20.8			6.8	6.5	54.5	14.5
Queue Delay	0.0			0.0	0.0	0.0	0.0
Total Delay	20.8			6.8	6.5	54.5	14.5
LOS	C			A	A	D	B
Approach Delay	20.8				6.5	46.5	
Approach LOS	C				A	D	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	14 (12%), Referenced to phase 2:WBT and 6:EBWB, Start of Red
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.74
Intersection Signal Delay:	19.5
Intersection Capacity Utilization	48.0%
Intersection LOS:	B
ICU Level of Service	A



Analysis Period (min) 15

Splits and Phases: 106: 121st & SE 8th St



Lanes, Volumes, Timings  
106: 121st & SE 8th St

05/28/2019



Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↙	↑↑	↙	↗
Traffic Volume (vph)	400	320	1	230	1010	160	30
Future Volume (vph)	400	320	1	230	1010	160	30
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		130		0	85
Storage Lanes		0		1		1	1
Taper Length (ft)				100		25	
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	1.00	1.00
Ped Bike Factor						1.00	0.99
Frt	0.933						0.850
Flt Protected				0.950		0.950	
Satd. Flow (prot)	3335	0	0	1787	3574	1787	1599
Flt Permitted				0.300		0.950	
Satd. Flow (perm)	3335	0	0	564	3574	1783	1576
Right Turn on Red		Yes					Yes
Satd. Flow (RTOR)	275						29
Link Speed (mph)	35				35	25	
Link Distance (ft)	729				908	353	
Travel Time (s)	14.2				17.7	11.8	
Confl. Peds. (#/hr)						1	1
Peak Hour Factor	0.89	0.89	0.97	0.97	0.97	0.83	0.83
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	449	360	1	237	1041	193	36
Shared Lane Traffic (%)							
Lane Group Flow (vph)	809	0	0	238	1041	193	36
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	12				12	12	
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	1.00
Turning Speed (mph)		9	9	15		15	9
Number of Detectors	2		2	1	3	2	0
Detector Template							
Leading Detector (ft)	126		100	37	296	100	0
Trailing Detector (ft)	2		2	2	2	2	0
Detector 1 Position(ft)	2		2	2	2	2	2
Detector 1 Size(ft)	20		6	35	20	20	6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	120		94		115	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	

Lanes, Volumes, Timings  
106: 121st & SE 8th St

05/28/2019



Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Detector 3 Position(ft)	290						
Detector 3 Size(ft)	6						
Detector 3 Type	Cl+Ex						
Detector 3 Channel							
Detector 3 Extend (s)	0.0						
Turn Type	NA	custom	D,P+P	NA	Prot	Perm	
Protected Phases	6			5	2	4	
Permitted Phases			5	6			4
Detector Phase	6		5	5	2	4	4
Switch Phase							
Minimum Initial (s)	7.0		5.0	5.0	7.0	5.0	5.0
Minimum Split (s)	17.0		10.0	10.0	12.0	22.5	22.5
Total Split (s)	80.0		20.0	20.0	100.0	30.0	30.0
Total Split (%)	61.5%		15.4%	15.4%	76.9%	23.1%	23.1%
Maximum Green (s)	75.0		15.0	15.0	95.0	25.5	25.5
Yellow Time (s)	4.0		4.0	4.0	4.0	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0			-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0			3.0	3.0	2.5	2.5
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Vehicle Extension (s)	2.0		2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0		2.0	2.0	2.0	2.0	2.0
Time Before Reduce (s)	0.0		0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	5.0		5.0	5.0	5.0	5.0	5.0
Recall Mode	C-Max		None	None	C-Max	None	None
Walk Time (s)	5.0					5.0	5.0
Flash Dont Walk (s)	7.0					13.0	13.0
Pedestrian Calls (#/hr)	0					1	1
Act Effct Green (s)	84.2			101.2	104.2	20.3	20.3
Actuated g/C Ratio	0.65			0.78	0.80	0.16	0.16
v/c Ratio	0.36			0.40	0.36	0.69	0.13
Control Delay	7.7			9.4	6.1	64.3	19.4
Queue Delay	0.0			0.0	0.0	0.0	0.0
Total Delay	7.7			9.4	6.1	64.3	19.4
LOS	A			A	A	E	B
Approach Delay	7.7				6.7	57.2	
Approach LOS	A				A	E	

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	115 (88%), Referenced to phase 2:WBT and 6:EBWB, Start of Red
Natural Cycle:	50
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.69
Intersection Signal Delay:	12.1
Intersection Capacity Utilization	53.2%
Intersection LOS:	B
ICU Level of Service	A

Analysis Period (min) 15

Splits and Phases: 106: 121st & SE 8th St





# MOVEMENT SUMMARY

 Site: 4 [8th and 121st AM]

Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: 121st											
3	L2	289	1.0	0.460	9.7	LOS A	2.2	55.8	0.65	0.89	23.4
18	R2	72	1.0	0.460	5.7	LOS A	2.2	55.8	0.65	0.89	23.4
Approach		361	1.0	0.460	8.9	LOS A	2.2	55.8	0.65	0.89	23.4
East: 8th											
1	L2	21	1.0	0.345	9.7	LOS A	2.2	55.3	0.53	0.52	28.8
6	T1	835	1.0	0.345	4.5	LOS A	2.3	58.0	0.52	0.49	29.7
Approach		856	1.0	0.345	4.6	LOS A	2.3	58.0	0.52	0.49	29.7
West: 8th											
2	T1	1034	1.0	0.367	3.5	LOS A	2.5	64.0	0.13	0.35	32.0
12	R2	90	1.0	0.367	3.7	LOS A	2.5	64.0	0.13	0.36	27.2
Approach		1124	1.0	0.367	3.5	LOS A	2.5	64.0	0.13	0.35	31.6
All Vehicles		2341	1.0	0.460	4.7	LOS A	2.5	64.0	0.35	0.49	29.6

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

 Site: 4 [8th and 121st PM]

Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: 121st											
3	L2	193	1.0	0.247	7.2	LOS A	1.1	27.8	0.50	0.68	23.0
18	R2	36	1.0	0.247	3.3	LOS A	1.1	27.8	0.50	0.68	21.4
Approach		229	1.0	0.247	6.6	LOS A	1.1	27.8	0.50	0.68	22.7
East: 8th											
1	L2	237	1.0	0.476	9.5	LOS A	3.4	85.5	0.49	0.56	28.0
6	T1	1041	1.0	0.476	4.2	LOS A	3.5	88.1	0.47	0.49	29.7
Approach		1278	1.0	0.476	5.2	LOS A	3.5	88.1	0.47	0.50	29.4
West: 8th											
2	T1	449	1.0	0.311	4.4	LOS A	1.9	48.2	0.45	0.48	30.2
12	R2	360	1.0	0.311	4.5	LOS A	1.9	48.2	0.43	0.52	25.5
Approach		809	1.0	0.311	4.5	LOS A	1.9	48.2	0.44	0.50	28.3
All Vehicles		2316	1.0	0.476	5.1	LOS A	3.5	88.1	0.46	0.52	28.3

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

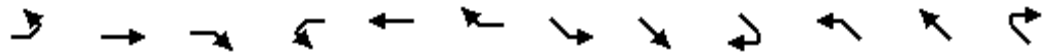
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Lanes, Volumes, Timings  
71: 116th Ave & SE 8th St/SE 7th Pl

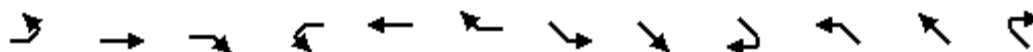
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	77	111	642	96	92	59	19	356	103	532	867	107
Future Volume (vph)	77	111	642	96	92	59	19	356	103	532	867	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	490		0	0		0	190		225	110		0
Storage Lanes	1		1	0		0	1		1	1		0
Taper Length (ft)	130			25			100			100		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor			0.97		1.00		1.00		0.99		1.00	
Frt			0.850		0.968				0.850		0.984	
Flt Protected	0.950	0.997			0.981		0.950			0.950		
Satd. Flow (prot)	1681	1764	1583	0	1735	0	1719	3438	1538	1752	3438	0
Flt Permitted	0.950	0.997			0.981		0.950			0.950		
Satd. Flow (perm)	1681	1764	1543	0	1727	0	1717	3438	1519	1752	3438	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			334		11				181		13	
Link Speed (mph)		35			25			35			40	
Link Distance (ft)		908			356			1436			800	
Travel Time (s)		17.7			9.7			28.0			11.1	
Confl. Peds. (#/hr)			9	9			2					2
Confl. Bikes (#/hr)									1			1
Peak Hour Factor	0.90	0.90	0.90	0.68	0.68	0.68	0.93	0.93	0.93	0.87	0.87	0.87
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	5%	5%	5%	3%	3%	3%
Adj. Flow (vph)	86	123	713	141	135	87	20	383	111	611	997	123
Shared Lane Traffic (%)	10%											
Lane Group Flow (vph)	77	132	713	0	363	0	20	383	111	611	1120	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		10			10			10			10	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	3	2	2	2		1	2	1	2	2	
Detector Template												
Leading Detector (ft)	536	536	536	100	81		22	131	131	141	141	
Trailing Detector (ft)	2	2	2	2	2		2	2	125	2	2	
Detector 1 Position(ft)	2	2	2	2	2		2	2	125	2	2	
Detector 1 Size(ft)	20	20	20	6	20		20	20	6	20	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94	94	530	94	75			125		135	135	
Detector 2 Size(ft)	6	6	6	6	6			6		6	6	
Detector 2 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings  
71: 116th Ave & SE 8th St/SE 7th Pl

05/28/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0			0.0		0.0	0.0	
Detector 3 Position(ft)	530	530										
Detector 3 Size(ft)	6	6										
Detector 3 Type	Cl+Ex	Cl+Ex										
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0										
Turn Type	Split	NA	pm+ov	Split	NA		Prot	NA	Free	Prot	NA	
Protected Phases	8	8	1	7	7		5	2		1	6	
Permitted Phases			8						Free			
Detector Phase	8	8	1	7	7		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	7.0		5.0	7.0	
Minimum Split (s)	30.5	30.5	10.2	9.5	9.5		10.2	12.2		10.2	24.2	
Total Split (s)	24.0	24.0	40.0	33.0	33.0		13.0	33.0		40.0	60.0	
Total Split (%)	18.5%	18.5%	30.8%	25.4%	25.4%		10.0%	25.4%		30.8%	46.2%	
Maximum Green (s)	19.5	19.5	34.8	28.5	28.5		7.8	27.8		34.8	54.8	
Yellow Time (s)	3.5	3.5	4.2	3.5	3.5		4.2	4.2		4.2	4.2	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0		-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	2.5	2.5	3.2		2.5		3.2	3.2		3.2	3.2	
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Walk Time (s)	5.0	5.0										5.0
Flash Dont Walk (s)	21.0	21.0										14.0
Pedestrian Calls (#/hr)	5	5										1
Act Effct Green (s)	16.6	16.6	57.6		30.5		8.7	29.8	130.0	41.8	67.0	
Actuated g/C Ratio	0.13	0.13	0.44		0.23		0.07	0.23	1.00	0.32	0.52	
v/c Ratio	0.36	0.59	0.81		0.88		0.18	0.49	0.07	1.09	0.63	
Control Delay	55.3	63.5	17.5		68.6		60.3	45.9	0.1	105.5	26.7	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	55.3	63.5	17.5		68.6		60.3	45.9	0.1	105.5	26.7	
LOS	E	E	B		E		E	D	A	F	C	
Approach Delay		27.2			68.6			36.6			54.5	
Approach LOS		C			E			D			D	

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Red
Natural Cycle:	120
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.09
Intersection Signal Delay:	46.2
Intersection LOS:	D

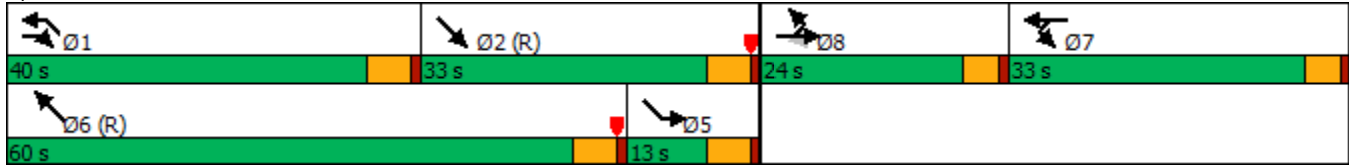


Lanes, Volumes, Timings  
 71: 116th Ave & SE 8th St/SE 7th Pl

05/28/2019

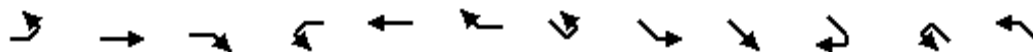
Intersection Capacity Utilization 74.3% ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 71: 116th Ave & SE 8th St/SE 7th Pl



Lanes, Volumes, Timings  
71: 116th Ave & SE 8th St/SE 7th Pl

05/28/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEU	SEL	SET	SER	NWU	NWL
Lane Configurations												
Traffic Volume (vph)	59	19	384	93	112	14	3	8	1368	602	2	469
Future Volume (vph)	59	19	384	93	112	14	3	8	1368	602	2	469
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	490		0	0		0		190		225		110
Storage Lanes	1		1	0		0		1		1		1
Taper Length (ft)	130			25				100				100
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Ped Bike Factor			0.98		1.00			0.99				
Frt			0.850		0.991					0.850		
Flt Protected	0.950	0.975			0.979			0.950				0.950
Satd. Flow (prot)	1681	1725	1583	0	1825	0	0	1787	3574	1599	0	1770
Flt Permitted	0.950	0.975			0.979			0.950				0.950
Satd. Flow (perm)	1681	1725	1547	0	1818	0	0	1770	3574	1599	0	1770
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			144		2					231		
Link Speed (mph)		35			25				35			
Link Distance (ft)		908			356				1436			
Travel Time (s)		17.7			9.7				28.0			
Confl. Peds. (#/hr)			7	7				8				
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.80	0.80	0.80	0.93	0.93	0.93	0.89	0.89	0.89	0.89	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	2%	2%
Adj. Flow (vph)	74	24	480	100	120	15	3	9	1537	676	2	521
Shared Lane Traffic (%)	35%											
Lane Group Flow (vph)	48	50	480	0	235	0	0	12	1537	676	0	523
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	R NA	Left
Median Width(ft)		12			12				12			
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	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	9	15		9	9	15
Number of Detectors	3	3	2	2	2		2	1	2	1	2	2
Detector Template												
Leading Detector (ft)	536	536	536	100	81		100	22	131	131	100	141
Trailing Detector (ft)	2	2	2	2	2		2	2	2	125	2	2
Detector 1 Position(ft)	2	2	2	2	2		2	2	2	125	2	2
Detector 1 Size(ft)	20	20	20	6	20		6	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94	94	530	94	75		94		125		94	135
Detector 2 Size(ft)	6	6	6	6	6		6		6		6	6
Detector 2 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings  
 71: 116th Ave & SE 8th St/SE 7th Pl

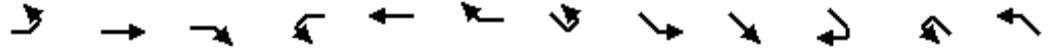
05/28/2019



Lane Group	NWT	NWR
Lane Configurations	↑↓	
Traffic Volume (vph)	652	38
Future Volume (vph)	652	38
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		
Lane Util. Factor	0.95	0.95
Ped Bike Factor	1.00	
Frt	0.992	
Flt Protected		
Satd. Flow (prot)	3502	0
Flt Permitted		
Satd. Flow (perm)	3502	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	7	
Link Speed (mph)	40	
Link Distance (ft)	800	
Travel Time (s)	11.1	
Confl. Peds. (#/hr)		8
Confl. Bikes (#/hr)		
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	2%	2%
Adj. Flow (vph)	724	42
Shared Lane Traffic (%)		
Lane Group Flow (vph)	766	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	12	
Link Offset(ft)	0	
Crosswalk Width(ft)	10	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Number of Detectors	2	
Detector Template		
Leading Detector (ft)	141	
Trailing Detector (ft)	2	
Detector 1 Position(ft)	2	
Detector 1 Size(ft)	20	
Detector 1 Type	Cl+Ex	
Detector 1 Channel		
Detector 1 Extend (s)	0.0	
Detector 1 Queue (s)	0.0	
Detector 1 Delay (s)	0.0	
Detector 2 Position(ft)	135	
Detector 2 Size(ft)	6	
Detector 2 Type	Cl+Ex	
Detector 2 Channel		

Lanes, Volumes, Timings  
 71: 116th Ave & SE 8th St/SE 7th Pl

05/28/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEU	SEL	SET	SER	NWU	NWL
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0
Detector 3 Position(ft)	530	530										
Detector 3 Size(ft)	6	6										
Detector 3 Type	Cl+Ex	Cl+Ex										
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0										
Turn Type	Split	NA	pm+ov	Split	NA		Prot	Prot	NA	Free	Prot	Prot
Protected Phases	8	8	1!	7	7		5	5	2		1!	1
Permitted Phases			8							Free		
Detector Phase	8	8	1	7	7		5	5	2		1	1
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	7.0		5.0	5.0
Minimum Split (s)	30.5	30.5	10.2	9.5	9.5		10.2	10.2	12.2		10.2	10.2
Total Split (s)	20.0	20.0	50.0	20.0	20.0		15.0	15.0	40.0		50.0	50.0
Total Split (%)	15.4%	15.4%	38.5%	15.4%	15.4%		11.5%	11.5%	30.8%		38.5%	38.5%
Maximum Green (s)	15.5	15.5	44.8	15.5	15.5		9.8	9.8	34.8		44.8	44.8
Yellow Time (s)	3.5	3.5	4.2	3.5	3.5		4.2	4.2	4.2		4.2	4.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0		-2.0			-2.0	-2.0			-2.0
Total Lost Time (s)	2.5	2.5	3.2		2.5			3.2	3.2			3.2
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lag	Lag	Lag		Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0		2.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0		2.0	2.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Time To Reduce (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0	5.0
Recall Mode	None	None	None	None	None		None	None	C-Max		None	None
Walk Time (s)	5.0	5.0										
Flash Dont Walk (s)	21.0	21.0										
Pedestrian Calls (#/hr)	4	4										
Act Effect Green (s)	11.0	11.0	56.5		21.8		9.0	40.3	130.0			47.4
Actuated g/C Ratio	0.08	0.08	0.43		0.17		0.07	0.31	1.00			0.36
v/c Ratio	0.34	0.34	0.63		0.77		0.10	1.39	0.42			0.81
Control Delay	61.7	61.7	11.9		68.2		56.9	215.4	0.8			48.7
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0	0.0			0.0
Total Delay	61.7	61.7	11.9		68.2		56.9	215.4	0.8			48.7
LOS	E	E	B		E		E	F	A			D
Approach Delay		20.4			68.2			149.3				
Approach LOS		C			E			F				

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 40 (31%), Referenced to phase 2:SET and 6:NWT, Start of Red  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.39  
 Intersection Signal Delay: 91.3  
 Intersection LOS: F





Lane Group	NWT	NWR
Detector 2 Extend (s)	0.0	
Detector 3 Position(ft)		
Detector 3 Size(ft)		
Detector 3 Type		
Detector 3 Channel		
Detector 3 Extend (s)		
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	7.0	
Minimum Split (s)	24.2	
Total Split (s)	75.0	
Total Split (%)	57.7%	
Maximum Green (s)	69.8	
Yellow Time (s)	4.2	
All-Red Time (s)	1.0	
Lost Time Adjust (s)	-2.0	
Total Lost Time (s)	3.2	
Lead/Lag	Lead	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	2.0	
Minimum Gap (s)	2.0	
Time Before Reduce (s)	0.0	
Time To Reduce (s)	5.0	
Recall Mode	C-Max	
Walk Time (s)	5.0	
Flash Dont Walk (s)	14.0	
Pedestrian Calls (#/hr)	4	
Act Effct Green (s)	84.9	
Actuated g/C Ratio	0.65	
v/c Ratio	0.33	
Control Delay	12.2	
Queue Delay	0.0	
Total Delay	12.2	
LOS	B	
Approach Delay	27.0	
Approach LOS	C	
<b>Intersection Summary</b>		

Lanes, Volumes, Timings  
 71: 116th Ave & SE 8th St/SE 7th Pl

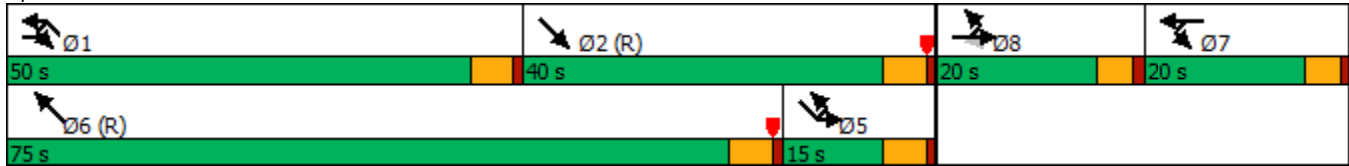
05/28/2019

Intersection Capacity Utilization 113.6%      ICU Level of Service H

Analysis Period (min) 15

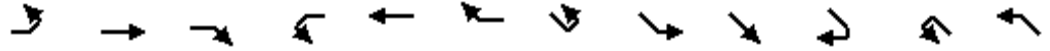
! Phase conflict between lane groups.

Splits and Phases: 71: 116th Ave & SE 8th St/SE 7th Pl



Lanes, Volumes, Timings  
 71: 116th Ave & SE 8th St/SE 7th Pl

05/28/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEU	SEL	SET	SER	NWU	NWL
Lane Configurations												
Traffic Volume (vph)	90	160	750	90	90	50	3	30	420	120	2	630
Future Volume (vph)	90	160	750	90	90	50	3	30	420	120	2	630
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	490		0	0		0		190		225		110
Storage Lanes	1		1	0		0		1		1		1
Taper Length (ft)	130			25				100				100
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Ped Bike Factor			0.98		1.00			1.00				
Frt			0.850		0.971					0.850		
Flt Protected	0.950	0.997			0.981			0.950				0.950
Satd. Flow (prot)	1681	1764	1583	0	1792	0	0	1787	3574	1599	0	1770
Flt Permitted	0.950	0.997			0.981			0.950				0.950
Satd. Flow (perm)	1681	1764	1547	0	1786	0	0	1779	3574	1599	0	1770
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			389		10					181		
Link Speed (mph)		35			25				35			
Link Distance (ft)		908			356				1436			
Travel Time (s)		17.7			9.7				28.0			
Confl. Peds. (#/hr)			7	7				8				
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.80	0.80	0.80	0.93	0.93	0.93	0.89	0.89	0.89	0.89	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	2%	2%
Adj. Flow (vph)	113	200	938	97	97	54	3	34	472	135	2	700
Shared Lane Traffic (%)	10%											
Lane Group Flow (vph)	102	211	938	0	248	0	0	37	472	135	0	702
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	R NA	Left
Median Width(ft)		12			12				12			
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	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	9	15		9	9	15
Number of Detectors	3	3	2	2	2		2	1	2	1	2	2
Detector Template												
Leading Detector (ft)	536	536	536	100	81		100	22	131	131	100	141
Trailing Detector (ft)	2	2	2	2	2		2	2	2	125	2	2
Detector 1 Position(ft)	2	2	2	2	2		2	2	2	125	2	2
Detector 1 Size(ft)	20	20	20	6	20		6	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94	94	530	94	75		94		125		94	135
Detector 2 Size(ft)	6	6	6	6	6		6		6		6	6
Detector 2 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings  
 71: 116th Ave & SE 8th St/SE 7th Pl

05/28/2019

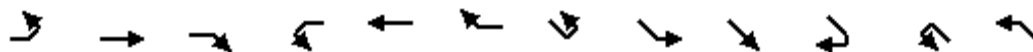


Lane Group	NWT	NWR
Lane Configurations	↑↓	
Traffic Volume (vph)	980	160
Future Volume (vph)	980	160
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		
Lane Util. Factor	0.95	0.95
Ped Bike Factor	0.99	
Frt	0.979	
Flt Protected		
Satd. Flow (prot)	3442	0
Flt Permitted		
Satd. Flow (perm)	3442	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	18	
Link Speed (mph)	40	
Link Distance (ft)	800	
Travel Time (s)	11.1	
Confl. Peds. (#/hr)		8
Confl. Bikes (#/hr)		
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	2%	2%
Adj. Flow (vph)	1089	178
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1267	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	12	
Link Offset(ft)	0	
Crosswalk Width(ft)	10	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Number of Detectors	2	
Detector Template		
Leading Detector (ft)	141	
Trailing Detector (ft)	2	
Detector 1 Position(ft)	2	
Detector 1 Size(ft)	20	
Detector 1 Type	Cl+Ex	
Detector 1 Channel		
Detector 1 Extend (s)	0.0	
Detector 1 Queue (s)	0.0	
Detector 1 Delay (s)	0.0	
Detector 2 Position(ft)	135	
Detector 2 Size(ft)	6	
Detector 2 Type	Cl+Ex	
Detector 2 Channel		



Lanes, Volumes, Timings  
71: 116th Ave & SE 8th St/SE 7th Pl

05/28/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEU	SEL	SET	SER	NWU	NWL
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0
Detector 3 Position(ft)	530	530										
Detector 3 Size(ft)	6	6										
Detector 3 Type	Cl+Ex	Cl+Ex										
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0										
Turn Type	Split	NA	pm+ov	Split	NA		Prot	Prot	NA	Free	Prot	Prot
Protected Phases	8	8	1!	7	7		5	5	2		1!	1
Permitted Phases			8							Free		
Detector Phase	8	8	1	7	7		5	5	2		1	1
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	7.0		5.0	5.0
Minimum Split (s)	30.5	30.5	10.2	9.5	9.5		10.2	10.2	12.2		10.2	10.2
Total Split (s)	24.0	24.0	40.0	33.0	33.0		13.0	13.0	33.0		40.0	40.0
Total Split (%)	18.5%	18.5%	30.8%	25.4%	25.4%		10.0%	10.0%	25.4%		30.8%	30.8%
Maximum Green (s)	19.5	19.5	34.8	28.5	28.5		7.8	7.8	27.8		34.8	34.8
Yellow Time (s)	3.5	3.5	4.2	3.5	3.5		4.2	4.2	4.2		4.2	4.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0		-2.0			-2.0	-2.0			-2.0
Total Lost Time (s)	2.5	2.5	3.2		2.5			3.2	3.2			3.2
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lag	Lag	Lag		Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0		2.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0		2.0	2.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Time To Reduce (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0	5.0
Recall Mode	None	None	None	None	None		None	None	C-Max		None	None
Walk Time (s)	5.0	5.0										
Flash Dont Walk (s)	21.0	21.0										
Pedestrian Calls (#/hr)	5	5										
Act Effct Green (s)	19.9	19.9	64.6		23.5			9.2	29.8	130.0		45.4
Actuated g/C Ratio	0.15	0.15	0.50		0.18			0.07	0.23	1.00		0.35
v/c Ratio	0.40	0.78	0.96		0.75			0.29	0.58	0.08		1.14
Control Delay	54.0	72.9	34.8		61.9			63.2	47.8	0.1		119.4
Queue Delay	0.0	0.0	0.0		0.0			0.0	0.0	0.0		0.0
Total Delay	54.0	72.9	34.8		61.9			63.2	47.8	0.1		119.4
LOS	D	E	C		E			E	D	A		F
Approach Delay		42.8			61.9				38.7			
Approach LOS		D			E				D			

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Red
Natural Cycle:	120
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.14
Intersection Signal Delay:	51.8
Intersection LOS:	D



Lane Group	NWT	NWR
Detector 2 Extend (s)	0.0	
Detector 3 Position(ft)		
Detector 3 Size(ft)		
Detector 3 Type		
Detector 3 Channel		
Detector 3 Extend (s)		
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	7.0	
Minimum Split (s)	24.2	
Total Split (s)	60.0	
Total Split (%)	46.2%	
Maximum Green (s)	54.8	
Yellow Time (s)	4.2	
All-Red Time (s)	1.0	
Lost Time Adjust (s)	-2.0	
Total Lost Time (s)	3.2	
Lead/Lag	Lead	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	2.0	
Minimum Gap (s)	2.0	
Time Before Reduce (s)	0.0	
Time To Reduce (s)	5.0	
Recall Mode	C-Max	
Walk Time (s)	5.0	
Flash Dont Walk (s)	14.0	
Pedestrian Calls (#/hr)	1	
Act Effct Green (s)	68.0	
Actuated g/C Ratio	0.52	
v/c Ratio	0.70	
Control Delay	28.0	
Queue Delay	0.0	
Total Delay	28.0	
LOS	C	
Approach Delay	60.6	
Approach LOS	E	
<b>Intersection Summary</b>		

Lanes, Volumes, Timings  
 71: 116th Ave & SE 8th St/SE 7th Pl

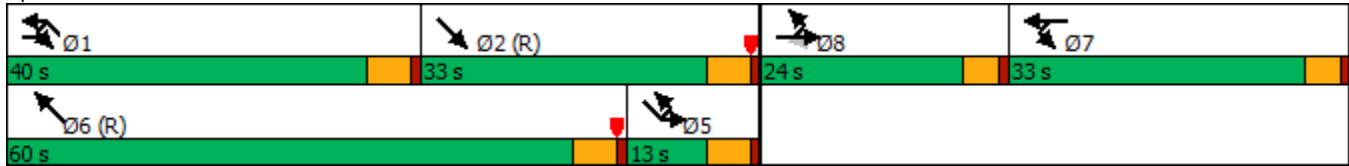
05/28/2019

Intersection Capacity Utilization 119.9% ICU Level of Service H

Analysis Period (min) 15

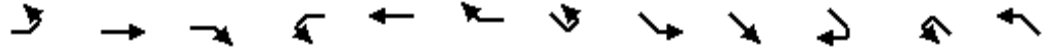
! Phase conflict between lane groups.

Splits and Phases: 71: 116th Ave & SE 8th St/SE 7th Pl



Lanes, Volumes, Timings  
71: 116th Ave & SE 8th St/SE 7th Pl

05/28/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEU	SEL	SET	SER	NWU	NWL
Lane Configurations												
Traffic Volume (vph)	70	30	330	150	170	30	3	20	1470	620	2	430
Future Volume (vph)	70	30	330	150	170	30	3	20	1470	620	2	430
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	490		0	0		0		190		225		110
Storage Lanes	1		1	0		0		1		1		1
Taper Length (ft)	130			25				100				100
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Ped Bike Factor			0.98		1.00			0.99				
Frt			0.850		0.989					0.850		
Flt Protected	0.950	0.980			0.979			0.950				0.950
Satd. Flow (prot)	1681	1734	1583	0	1821	0	0	1787	3574	1599	0	1770
Flt Permitted	0.950	0.980			0.979			0.950				0.950
Satd. Flow (perm)	1681	1734	1547	0	1814	0	0	1774	3574	1599	0	1770
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			100		3					222		
Link Speed (mph)		35			25				35			
Link Distance (ft)		908			356				1436			
Travel Time (s)		17.7			9.7				28.0			
Confl. Peds. (#/hr)			7	7				8				
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.80	0.80	0.80	0.93	0.93	0.93	0.89	0.89	0.89	0.89	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	2%	2%
Adj. Flow (vph)	88	38	413	161	183	32	3	22	1652	697	2	478
Shared Lane Traffic (%)	29%											
Lane Group Flow (vph)	62	64	413	0	376	0	0	25	1652	697	0	480
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	R NA	Left
Median Width(ft)		12			12				12			
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	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	9	15		9	9	15
Number of Detectors	3	3	2	2	2		2	1	2	1	2	2
Detector Template												
Leading Detector (ft)	536	536	536	100	81		100	22	131	131	100	141
Trailing Detector (ft)	2	2	2	2	2		2	2	2	125	2	2
Detector 1 Position(ft)	2	2	2	2	2		2	2	2	125	2	2
Detector 1 Size(ft)	20	20	20	6	20		6	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94	94	530	94	75		94		125		94	135
Detector 2 Size(ft)	6	6	6	6	6		6		6		6	6
Detector 2 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex
Detector 2 Channel												



Lanes, Volumes, Timings  
 71: 116th Ave & SE 8th St/SE 7th Pl

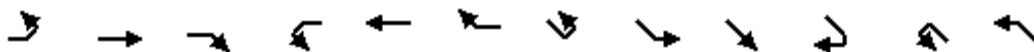
05/28/2019



Lane Group	NWT	NWR
Lane Configurations	↑↓	
Traffic Volume (vph)	790	70
Future Volume (vph)	790	70
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		
Lane Util. Factor	0.95	0.95
Ped Bike Factor	1.00	
Frt	0.988	
Flt Protected		
Satd. Flow (prot)	3483	0
Flt Permitted		
Satd. Flow (perm)	3483	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	11	
Link Speed (mph)	40	
Link Distance (ft)	800	
Travel Time (s)	11.1	
Confl. Peds. (#/hr)		8
Confl. Bikes (#/hr)		
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	2%	2%
Adj. Flow (vph)	878	78
Shared Lane Traffic (%)		
Lane Group Flow (vph)	956	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	12	
Link Offset(ft)	0	
Crosswalk Width(ft)	10	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Number of Detectors	2	
Detector Template		
Leading Detector (ft)	141	
Trailing Detector (ft)	2	
Detector 1 Position(ft)	2	
Detector 1 Size(ft)	20	
Detector 1 Type	Cl+Ex	
Detector 1 Channel		
Detector 1 Extend (s)	0.0	
Detector 1 Queue (s)	0.0	
Detector 1 Delay (s)	0.0	
Detector 2 Position(ft)	135	
Detector 2 Size(ft)	6	
Detector 2 Type	Cl+Ex	
Detector 2 Channel		

Lanes, Volumes, Timings  
71: 116th Ave & SE 8th St/SE 7th Pl

05/28/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEU	SEL	SET	SER	NWU	NWL
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0
Detector 3 Position(ft)	530	530										
Detector 3 Size(ft)	6	6										
Detector 3 Type	Cl+Ex	Cl+Ex										
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0										
Turn Type	Split	NA	pm+ov	Split	NA		Prot	Prot	NA	Free	Prot	Prot
Protected Phases	8	8	1!	7	7		5	5	2		1!	1
Permitted Phases			8							Free		
Detector Phase	8	8	1	7	7		5	5	2		1	1
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	7.0		5.0	5.0
Minimum Split (s)	30.5	30.5	10.2	9.5	9.5		10.2	10.2	12.2		10.2	10.2
Total Split (s)	20.0	20.0	50.0	20.0	20.0		15.0	15.0	40.0		50.0	50.0
Total Split (%)	15.4%	15.4%	38.5%	15.4%	15.4%		11.5%	11.5%	30.8%		38.5%	38.5%
Maximum Green (s)	15.5	15.5	44.8	15.5	15.5		9.8	9.8	34.8		44.8	44.8
Yellow Time (s)	3.5	3.5	4.2	3.5	3.5		4.2	4.2	4.2		4.2	4.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0		-2.0			-2.0	-2.0			-2.0
Total Lost Time (s)	2.5	2.5	3.2		2.5			3.2	3.2			3.2
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lag	Lag	Lag		Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0		2.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0		2.0	2.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Time To Reduce (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0	5.0
Recall Mode	None	None	None	None	None		None	None	C-Max		None	None
Walk Time (s)	5.0	5.0										
Flash Dont Walk (s)	21.0	21.0										
Pedestrian Calls (#/hr)	4	4										
Act Effct Green (s)	11.7	11.7	56.5		23.3			9.9	38.0	130.0		45.6
Actuated g/C Ratio	0.09	0.09	0.43		0.18			0.08	0.29	1.00		0.35
v/c Ratio	0.41	0.41	0.56		1.14			0.18	1.58	0.44		0.77
Control Delay	60.5	59.9	8.3		141.5			58.4	298.2	0.9		47.2
Queue Delay	0.0	0.0	0.0		0.0			0.0	0.0	0.0		0.0
Total Delay	60.5	59.9	8.3		141.5			58.4	298.2	0.9		47.2
LOS	E	E	A		F			E	F	A		D
Approach Delay		20.4			141.5				208.4			
Approach LOS		C			F				F			

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	40 (31%), Referenced to phase 2:SET and 6:NWT, Start of Red
Natural Cycle:	150
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.58
Intersection Signal Delay:	126.3
Intersection LOS:	F



Lane Group	NWT	NWR
Detector 2 Extend (s)	0.0	
Detector 3 Position(ft)		
Detector 3 Size(ft)		
Detector 3 Type		
Detector 3 Channel		
Detector 3 Extend (s)		
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	7.0	
Minimum Split (s)	24.2	
Total Split (s)	75.0	
Total Split (%)	57.7%	
Maximum Green (s)	69.8	
Yellow Time (s)	4.2	
All-Red Time (s)	1.0	
Lost Time Adjust (s)	-2.0	
Total Lost Time (s)	3.2	
Lead/Lag	Lead	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	2.0	
Minimum Gap (s)	2.0	
Time Before Reduce (s)	0.0	
Time To Reduce (s)	5.0	
Recall Mode	C-Max	
Walk Time (s)	5.0	
Flash Dont Walk (s)	14.0	
Pedestrian Calls (#/hr)	4	
Act Effct Green (s)	77.8	
Actuated g/C Ratio	0.60	
v/c Ratio	0.46	
Control Delay	16.1	
Queue Delay	0.0	
Total Delay	16.1	
LOS	B	
Approach Delay	26.5	
Approach LOS	C	
<b>Intersection Summary</b>		

Lanes, Volumes, Timings  
 71: 116th Ave & SE 8th St/SE 7th Pl

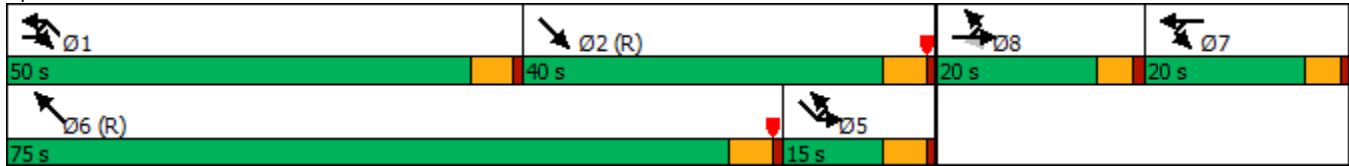
05/28/2019

Intersection Capacity Utilization 118.1% ICU Level of Service H

Analysis Period (min) 15

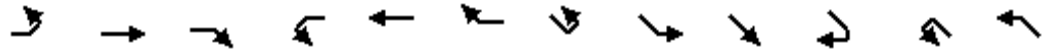
! Phase conflict between lane groups.

Splits and Phases: 71: 116th Ave & SE 8th St/SE 7th Pl



Lanes, Volumes, Timings  
 71: 116th Ave & SE 8th St/SE 7th Pl

05/28/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEU	SEL	SET	SER	NWU	NWL
Lane Configurations		↕	↗		↔			↖	↕↕	↗		↖↗
Traffic Volume (vph)	90	160	750	90	90	50	3	30	420	120	2	630
Future Volume (vph)	90	160	750	90	90	50	3	30	420	120	2	630
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	490		0	0		0		190		225		110
Storage Lanes	0		1	0		0		1		1		2
Taper Length (ft)	130			25				100				100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	0.97
Ped Bike Factor			0.98		1.00			1.00				
Frt			0.850		0.971					0.850		
Flt Protected		0.982			0.981			0.950				0.950
Satd. Flow (prot)	0	1829	1583	0	1792	0	0	1787	3574	1599	0	3433
Flt Permitted		0.982			0.981			0.950				0.950
Satd. Flow (perm)	0	1829	1547	0	1787	0	0	1779	3574	1599	0	3433
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			401		10							
Link Speed (mph)		35			25			35				
Link Distance (ft)		908			356			1436				
Travel Time (s)		17.7			9.7			28.0				
Confl. Peds. (#/hr)			7	7				8				
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.80	0.80	0.80	0.93	0.93	0.93	0.89	0.89	0.89	0.89	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	2%	2%
Adj. Flow (vph)	113	200	938	97	97	54	3	34	472	135	2	700
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	313	938	0	248	0	0	37	472	135	0	702
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	R NA	Left
Median Width(ft)		0			0			24				
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	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	9	15		9	9	15
Number of Detectors	3	3	2	2	2		2	1	2	1	2	2
Detector Template												
Leading Detector (ft)	536	536	536	100	81		100	22	131	131	100	141
Trailing Detector (ft)	2	2	2	2	2		2	2	2	125	2	2
Detector 1 Position(ft)	2	2	2	2	2		2	2	2	125	2	2
Detector 1 Size(ft)	20	20	20	6	20		6	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94	94	530	94	75		94		125		94	135
Detector 2 Size(ft)	6	6	6	6	6		6		6		6	6
Detector 2 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex
Detector 2 Channel												



Lanes, Volumes, Timings  
 71: 116th Ave & SE 8th St/SE 7th Pl

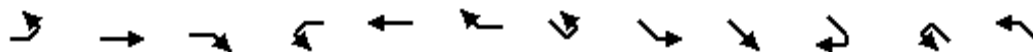
05/28/2019



Lane Group	NWT	NWR
Lane Configurations	↑↓	
Traffic Volume (vph)	980	160
Future Volume (vph)	980	160
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		
Lane Util. Factor	0.95	0.95
Ped Bike Factor	0.99	
Frt	0.979	
Flt Protected		
Satd. Flow (prot)	3442	0
Flt Permitted		
Satd. Flow (perm)	3442	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	18	
Link Speed (mph)	40	
Link Distance (ft)	800	
Travel Time (s)	11.1	
Confl. Peds. (#/hr)		8
Confl. Bikes (#/hr)		
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	2%	2%
Adj. Flow (vph)	1089	178
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1267	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	24	
Link Offset(ft)	0	
Crosswalk Width(ft)	10	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Number of Detectors	2	
Detector Template		
Leading Detector (ft)	141	
Trailing Detector (ft)	2	
Detector 1 Position(ft)	2	
Detector 1 Size(ft)	20	
Detector 1 Type	Cl+Ex	
Detector 1 Channel		
Detector 1 Extend (s)	0.0	
Detector 1 Queue (s)	0.0	
Detector 1 Delay (s)	0.0	
Detector 2 Position(ft)	135	
Detector 2 Size(ft)	6	
Detector 2 Type	Cl+Ex	
Detector 2 Channel		

Lanes, Volumes, Timings  
71: 116th Ave & SE 8th St/SE 7th Pl

05/28/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEU	SEL	SET	SER	NWU	NWL
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0
Detector 3 Position(ft)	530	530										
Detector 3 Size(ft)	6	6										
Detector 3 Type	Cl+Ex	Cl+Ex										
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0										
Turn Type	Split	NA	pm+ov	Split	NA		Prot	Prot	NA	custom	Prot	Prot
Protected Phases	8	8	1!	7	7		5	5	2		1!	1
Permitted Phases			8							1 2 8 7		
Detector Phase	8	8	1	7	7		5	5	2	1 2 8 7	1	1
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	7.0		5.0	5.0
Minimum Split (s)	30.5	30.5	10.2	9.5	9.5		10.2	10.2	12.2		10.2	10.2
Total Split (s)	24.0	24.0	43.0	33.0	33.0		13.0	13.0	30.0		43.0	43.0
Total Split (%)	18.5%	18.5%	33.1%	25.4%	25.4%		10.0%	10.0%	23.1%		33.1%	33.1%
Maximum Green (s)	19.5	19.5	37.8	28.5	28.5		7.8	7.8	24.8		37.8	37.8
Yellow Time (s)	3.5	3.5	4.2	3.5	3.5		4.2	4.2	4.2		4.2	4.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)		-2.0	-2.0		-2.0			-2.0	-2.0			-2.0
Total Lost Time (s)		2.5	3.2		2.5			3.2	3.2			3.2
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lag	Lag	Lag		Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0		2.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0		2.0	2.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Time To Reduce (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0	5.0
Recall Mode	None	None	None	None	None		None	None	C-Max		None	None
Walk Time (s)	5.0	5.0										
Flash Dont Walk (s)	21.0	21.0										
Pedestrian Calls (#/hr)	5	5										
Act Effect Green (s)		21.5	67.8		23.3			9.2	26.8	130.0		47.0
Actuated g/C Ratio		0.17	0.52		0.18			0.07	0.21	1.00		0.36
v/c Ratio		1.04	0.93		0.76			0.29	0.64	0.08		0.57
Control Delay		113.9	27.7		62.7			63.2	51.8	0.1		36.5
Queue Delay		0.0	0.0		0.0			0.0	0.0	0.0		0.0
Total Delay		113.9	27.7		62.7			63.2	51.8	0.1		36.5
LOS		F	C		E			E	D	A		D
Approach Delay		49.3			62.7				41.6			
Approach LOS		D			E				D			

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Red
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.04
Intersection Signal Delay:	40.4
Intersection LOS:	D



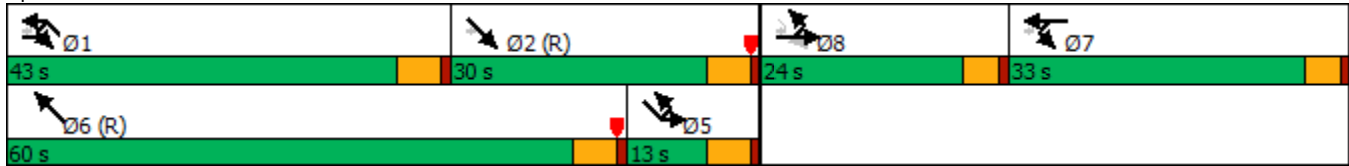
Lane Group	NWT	NWR
Detector 2 Extend (s)	0.0	
Detector 3 Position(ft)		
Detector 3 Size(ft)		
Detector 3 Type		
Detector 3 Channel		
Detector 3 Extend (s)		
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	7.0	
Minimum Split (s)	24.2	
Total Split (s)	60.0	
Total Split (%)	46.2%	
Maximum Green (s)	54.8	
Yellow Time (s)	4.2	
All-Red Time (s)	1.0	
Lost Time Adjust (s)	-2.0	
Total Lost Time (s)	3.2	
Lead/Lag	Lead	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	2.0	
Minimum Gap (s)	2.0	
Time Before Reduce (s)	0.0	
Time To Reduce (s)	5.0	
Recall Mode	C-Max	
Walk Time (s)	5.0	
Flash Dont Walk (s)	14.0	
Pedestrian Calls (#/hr)	1	
Act Effct Green (s)	66.6	
Actuated g/C Ratio	0.51	
v/c Ratio	0.71	
Control Delay	28.7	
Queue Delay	0.0	
Total Delay	28.7	
LOS	C	
Approach Delay	31.5	
Approach LOS	C	
<b>Intersection Summary</b>		

Lanes, Volumes, Timings  
 71: 116th Ave & SE 8th St/SE 7th Pl

05/28/2019

Intersection Capacity Utilization 102.9% ICU Level of Service G  
 Analysis Period (min) 15  
 ! Phase conflict between lane groups.

Splits and Phases: 71: 116th Ave & SE 8th St/SE 7th Pl



# Timings

71: 116th Ave & SE 8th St/SE 7th PI

05/16/2019

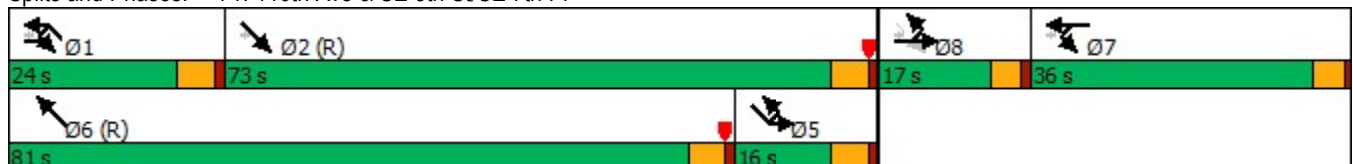


Lane Group	EBT	EBR	WBT	SEL	SET	SER	NWL	NWT
Lane Configurations	↕	↗	↔	↖	↕	↗	↖	↗
Traffic Volume (vph)	30	330	170	20	1470	620	430	790
Future Volume (vph)	30	330	170	20	1470	620	430	790
Turn Type	NA	pm+ov	NA	Prot	NA	custom	Prot	NA
Protected Phases	8	1!	7	5	2		1	6
Permitted Phases		8				1 2 8 7		
Detector Phase	8	1	7	5	2	1 2 8 7	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0		5.0	7.0
Minimum Split (s)	30.5	10.2	9.5	10.2	12.2		10.2	24.2
Total Split (s)	17.0	24.0	36.0	16.0	73.0		24.0	81.0
Total Split (%)	11.3%	16.0%	24.0%	10.7%	48.7%		16.0%	54.0%
Yellow Time (s)	3.5	4.2	3.5	4.2	4.2		4.2	4.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0
Total Lost Time (s)	2.5	3.2	2.5	3.2	3.2		3.2	3.2
Lead/Lag	Lead	Lead	Lag	Lag	Lag		Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Max		None	C-Max
Act Effct Green (s)	14.5	35.2	32.9	10.6	69.8	150.0	21.4	84.8
Actuated g/C Ratio	0.10	0.23	0.22	0.07	0.47	1.00	0.14	0.57
v/c Ratio	0.73	0.86	0.94	0.20	0.99	0.44	0.98	0.48
Control Delay	89.4	41.8	88.0	68.2	60.2	0.9	99.3	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.4	41.8	88.0	68.2	60.2	0.9	99.3	21.5
LOS	F	D	F	E	E	A	F	C
Approach Delay	52.9		88.0		42.8			47.5
Approach LOS	D		F		D			D

## Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Red  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 49.0  
 Intersection LOS: D  
 Intersection Capacity Utilization 106.5%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ! Phase conflict between lane groups.

Splits and Phases: 71: 116th Ave & SE 8th St/SE 7th PI





# Queues

71: 116th Ave & SE 8th St/SE 7th Pl

05/16/2019



Lane Group	EBT	EBR	WBT	SEL	SET	SER	NWL	NWT
Lane Group Flow (vph)	126	413	376	25	1652	697	480	956
v/c Ratio	0.73	0.86	0.94	0.20	0.99	0.44	0.98	0.48
Control Delay	89.4	41.8	88.0	68.2	60.2	0.9	99.3	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.4	41.8	88.0	68.2	60.2	0.9	99.3	21.5
Queue Length 50th (ft)	122	166	361	23	833	0	~248	315
Queue Length 95th (ft)	172	207	#556	55	#993	0	#369	377
Internal Link Dist (ft)	828		276		1356			720
Turn Bay Length (ft)				190		225	110	
Base Capacity (vph)	173	482	409	152	1663	1598	490	1972
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.86	0.92	0.16	0.99	0.44	0.98	0.48

## Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

# MOVEMENT SUMMARY

 Site: 5 [8th and Lake Hills AM]

New Site  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Lake Hills Conn											
3	L2	700	2.0	0.836	17.7	LOS A	14.1	359.4	0.98	0.99	32.1
8	T1	1089	2.0	0.836	10.5	LOS A	14.5	367.7	0.94	0.91	34.3
18	R2	178	2.0	0.836	10.3	LOS A	14.5	367.7	0.94	0.89	30.7
Approach		1967	2.0	0.836	13.1	LOS B	14.5	367.7	0.96	0.94	33.2
East: 7th											
1	L2	97	1.0	0.657	17.1	LOS A	4.1	103.3	0.92	1.08	29.2
6	T1	97	1.0	0.657	12.1	LOS A	4.1	103.3	0.92	1.08	22.5
16	R2	54	1.0	0.657	12.8	LOS A	4.1	103.3	0.92	1.08	24.5
Approach		247	1.0	0.657	14.2	LOS B	4.1	103.3	0.92	1.08	26.1
North: Lake Hills Conn											
7	L2	34	1.0	0.391	15.4	LOS A	3.0	75.5	0.95	0.94	27.8
4	T1	472	1.0	0.391	8.9	LOS A	3.4	86.4	0.97	0.90	34.4
14	R2	135	1.0	0.081	3.0	LOS A	0.0	0.0	0.00	0.41	32.8
Approach		640	1.0	0.391	8.0	LOS A	3.4	86.4	0.76	0.80	33.9
West: 8th											
5	L2	113	2.0	0.622	11.4	LOS A	4.6	116.5	0.73	0.81	31.6
2	T1	200	2.0	0.622	5.9	LOS A	4.6	116.5	0.73	0.81	26.2
12	R2	938	2.0	0.622	7.1	LOS A	4.6	116.5	0.75	0.90	34.4
Approach		1250	2.0	0.622	7.3	LOS A	4.6	116.5	0.74	0.88	33.1
All Vehicles		4104	1.8	0.836	10.6	LOS B	14.5	367.7	0.86	0.91	32.9

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: H:\(p) Projects\18\18112-002 Bellevue TO 2 Corridor Improvements (Reid Middleton)\Analysis\SIDRA\Future Build\Study Area 1\Future Build 3\20190204\_Study Area 1 Future Build 3.sip7

# MOVEMENT SUMMARY

 Site: 5 [8th and Lake Hills PM]

New Site  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Lake Hills Conn											
3	L2	478	2.0	0.524	10.7	LOS A	4.5	114.0	0.51	0.61	34.7
8	T1	878	2.0	0.524	4.9	LOS A	4.6	118.1	0.49	0.50	35.6
18	R2	78	2.0	0.524	4.9	LOS A	4.6	118.1	0.49	0.47	31.8
Approach		1433	2.0	0.524	6.8	LOS A	4.6	118.1	0.50	0.53	35.1
East: 7th											
1	L2	161	1.0	0.578	11.2	LOS A	3.3	83.0	0.79	0.96	30.9
6	T1	183	1.0	0.578	6.2	LOS A	3.3	83.0	0.79	0.96	24.7
16	R2	32	1.0	0.578	7.0	LOS A	3.3	83.0	0.79	0.96	26.3
Approach		376	1.0	0.578	8.4	LOS A	3.3	83.0	0.79	0.96	28.2
North: Lake Hills Conn											
7	L2	22	1.0	1.001	55.5	LOS F	30.1	757.7	1.00	2.01	18.1
4	T1	1652	1.0	1.001	47.4	LOS F	37.0	933.6	1.00	2.05	24.4
14	R2	697	1.0	0.420	3.1	LOS A	0.0	0.0	0.00	0.41	32.8
Approach		2371	1.0	1.001	34.4	LOS C	37.0	933.6	0.71	1.57	25.5
West: 8th											
5	L2	88	2.0	0.536	16.6	LOS A	3.5	89.2	0.93	1.03	28.7
2	T1	38	2.0	0.536	11.1	LOS A	3.5	89.2	0.93	1.03	24.0
12	R2	413	2.0	0.536	10.9	LOS A	3.5	89.2	0.92	1.03	32.7
Approach		538	2.0	0.536	11.8	LOS B	3.5	89.2	0.93	1.03	31.7
All Vehicles		4718	1.4	1.001	21.4	LOS C	37.0	933.6	0.67	1.14	28.9

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Lanes, Volumes, Timings  
134: Richard Rd & Lk Hills Conn

05/28/2019



Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations		↑↑	↑		↑	↑↑	↑↑	↑
Traffic Volume (vph)	1	264	829	1	145	579	926	134
Future Volume (vph)	1	264	829	1	145	579	926	134
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		325		100		0	100
Storage Lanes	0		1		1		2	1
Taper Length (ft)	25				100		25	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	0.95	0.97	1.00
Ped Bike Factor			0.99		1.00			0.98
Frt			0.850					0.850
Flt Protected					0.950		0.950	
Satd. Flow (prot)	0	3471	1553	0	1752	3505	3400	1568
Flt Permitted		0.953			0.950		0.950	
Satd. Flow (perm)	0	3308	1533	0	1751	3505	3400	1541
Right Turn on Red			Yes					Yes
Satd. Flow (RTOR)			921					136
Link Speed (mph)		40				40	35	
Link Distance (ft)		593				660	1203	
Travel Time (s)		10.3				15.0	23.4	
Confl. Peds. (#/hr)			1		1			4
Confl. Bikes (#/hr)			1					2
Peak Hour Factor	0.90	0.90	0.90	0.89	0.89	0.89	0.82	0.82
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	3%	3%
Adj. Flow (vph)	1	293	921	1	163	651	1129	163
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	294	921	0	164	651	1129	163
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	24	
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	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Number of Detectors	2	2	2	2	2	2	2	2
Detector Template								
Leading Detector (ft)	100	136	136	100	116	136	141	141
Trailing Detector (ft)	2	2	2	2	2	2	2	2
Detector 1 Position(ft)	2	2	2	2	2	2	2	2
Detector 1 Size(ft)	6	20	20	6	20	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel								
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94	130	130	94	110	130	135	135
Detector 2 Size(ft)	6	6	6	6	6	6	6	6
Detector 2 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 2 Channel								

Lanes, Volumes, Timings  
134: Richard Rd & Lk Hills Conn

05/28/2019



Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Free	Prot	Prot	NA	Prot	pm+ov
Protected Phases		2		1!	1	6	8	1!
Permitted Phases	2		Free					8
Detector Phase	2	2		1	1	6	8	1
Switch Phase								
Minimum Initial (s)	7.0	7.0		5.0	5.0	7.0	5.0	5.0
Minimum Split (s)	25.0	25.0		10.5	10.5	12.0	30.3	10.5
Total Split (s)	30.0	30.0		20.0	20.0	50.0	40.0	20.0
Total Split (%)	33.3%	33.3%		22.2%	22.2%	55.6%	44.4%	22.2%
Maximum Green (s)	25.0	25.0		14.5	14.5	45.0	34.7	14.5
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.1	4.0
All-Red Time (s)	1.0	1.0		1.5	1.5	1.0	1.2	1.5
Lost Time Adjust (s)		-2.0				-2.0	-2.0	-2.0
Total Lost Time (s)		3.0				3.0	3.3	3.5
Lead/Lag	Lag	Lag		Lead	Lead			Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0
Recall Mode	Min	Min		None	None	Min	None	None
Walk Time (s)	5.0	5.0					18.0	
Flash Dont Walk (s)	15.0	15.0					7.0	
Pedestrian Calls (#/hr)	1	1					2	
Act Effect Green (s)		13.6	66.6		12.7	30.0	30.0	42.5
Actuated g/C Ratio		0.20	1.00		0.19	0.45	0.45	0.64
v/c Ratio		0.43	0.60		0.49	0.41	0.74	0.16
Control Delay		26.7	1.8		32.3	13.8	19.3	1.6
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0
Total Delay		26.7	1.8		32.3	13.8	19.3	1.6
LOS		C	A		C	B	B	A
Approach Delay		7.8				17.5	17.1	
Approach LOS		A				B	B	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 66.6

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 13.8

Intersection LOS: B

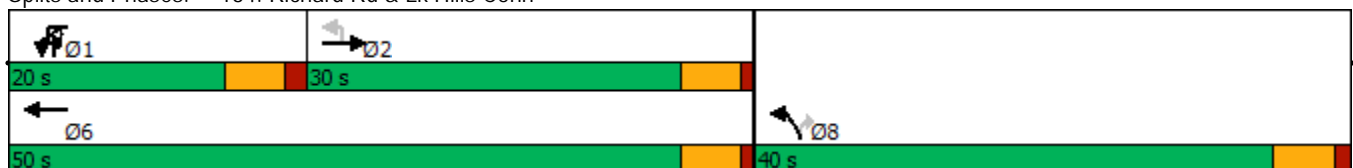
Intersection Capacity Utilization 60.1%

ICU Level of Service B

Analysis Period (min) 15

! Phase conflict between lane groups.

Splits and Phases: 134: Richard Rd & Lk Hills Conn





Lanes, Volumes, Timings  
134: Richard Rd & Lk Hills Conn

05/28/2019



Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations		↑↑	↑		↓	↑↑	↑↑	↑
Traffic Volume (vph)	2	553	1292	1	265	302	857	127
Future Volume (vph)	2	553	1292	1	265	302	857	127
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		325		100		0	100
Storage Lanes	0		1		1		2	1
Taper Length (ft)	25				100		25	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	0.95	0.97	1.00
Ped Bike Factor			0.99					0.98
Frt			0.850					0.850
Flt Protected					0.950		0.950	
Satd. Flow (prot)	0	3574	1599	0	1770	3539	3467	1599
Flt Permitted		0.954			0.950		0.950	
Satd. Flow (perm)	0	3410	1579	0	1770	3539	3467	1570
Right Turn on Red			Yes					Yes
Satd. Flow (RTOR)			906					74
Link Speed (mph)		40				40	35	
Link Distance (ft)		593				660	1203	
Travel Time (s)		10.3				15.0	23.4	
Confl. Peds. (#/hr)								4
Confl. Bikes (#/hr)			2					
Peak Hour Factor	0.98	0.98	0.98	0.84	0.84	0.84	0.98	0.98
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%
Adj. Flow (vph)	2	564	1318	1	315	360	874	130
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	566	1318	0	316	360	874	130
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	24	
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	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Number of Detectors	2	2	2	2	2	2	2	2
Detector Template								
Leading Detector (ft)	100	136	136	100	116	136	141	141
Trailing Detector (ft)	2	2	2	2	2	2	2	2
Detector 1 Position(ft)	2	2	2	2	2	2	2	2
Detector 1 Size(ft)	6	20	20	6	20	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel								
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94	130	130	94	110	130	135	135
Detector 2 Size(ft)	6	6	6	6	6	6	6	6
Detector 2 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 2 Channel								

# Lanes, Volumes, Timings

## 134: Richard Rd & Lk Hills Conn

05/28/2019



Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Free	Prot	Prot	NA	Prot	pm+ov
Protected Phases		2		1!	1	6	8	1!
Permitted Phases	2		Free					8
Detector Phase	2	2		1	1	6	8	1
Switch Phase								
Minimum Initial (s)	7.0	7.0		5.0	5.0	7.0	5.0	5.0
Minimum Split (s)	25.0	25.0		10.5	10.5	12.0	30.3	10.5
Total Split (s)	63.0	63.0		27.0	27.0	90.0	40.0	27.0
Total Split (%)	48.5%	48.5%		20.8%	20.8%	69.2%	30.8%	20.8%
Maximum Green (s)	58.0	58.0		21.5	21.5	85.0	34.7	21.5
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.1	4.0
All-Red Time (s)	1.0	1.0		1.5	1.5	1.0	1.2	1.5
Lost Time Adjust (s)		-2.0				-2.0	-2.0	-2.0
Total Lost Time (s)		3.0				3.0	3.3	3.5
Lead/Lag	Lag	Lag		Lead	Lead			Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0
Recall Mode	Max	Max		None	None	Max	None	None
Walk Time (s)	5.0	5.0					18.0	
Flash Dont Walk (s)	15.0	15.0					7.0	
Pedestrian Calls (#/hr)	0	0					2	
Act Effct Green (s)		60.0	129.1		23.5	87.0	35.8	59.1
Actuated g/C Ratio		0.46	1.00		0.18	0.67	0.28	0.46
v/c Ratio		0.36	0.83		0.98	0.15	0.91	0.17
Control Delay		23.1	5.4		98.9	7.9	59.4	8.9
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0
Total Delay		23.1	5.4		98.9	7.9	59.4	8.9
LOS		C	A		F	A	E	A
Approach Delay		10.7				50.5	52.9	
Approach LOS		B				D	D	

### Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 129.1

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 30.1

Intersection LOS: C

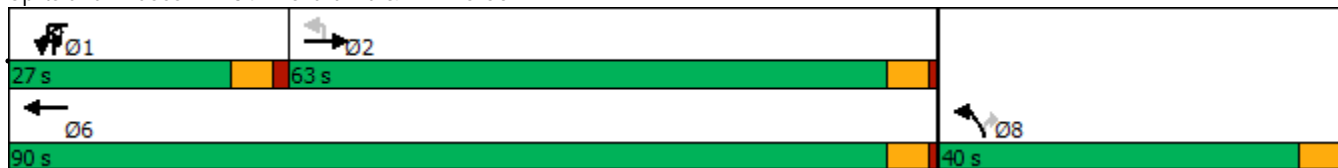
Intersection Capacity Utilization 64.5%

ICU Level of Service C

Analysis Period (min) 15

! Phase conflict between lane groups.

Splits and Phases: 134: Richard Rd & Lk Hills Conn



Lanes, Volumes, Timings  
134: Richard Rd & Lk Hills Conn

05/28/2019



Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations		↑↑	↑		↑	↑↑	↑↑	↑
Traffic Volume (vph)	2	350	910	1	130	630	1110	160
Future Volume (vph)	2	350	910	1	130	630	1110	160
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		325		100		0	100
Storage Lanes	0		1		1		2	1
Taper Length (ft)	25				100		25	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	0.95	0.97	1.00
Ped Bike Factor			0.99					0.98
Frt			0.850					0.850
Flt Protected					0.950		0.950	
Satd. Flow (prot)	0	3574	1599	0	1770	3539	3467	1599
Flt Permitted		0.950			0.950		0.950	
Satd. Flow (perm)	0	3396	1579	0	1770	3539	3467	1573
Right Turn on Red			Yes					Yes
Satd. Flow (RTOR)			929					136
Link Speed (mph)		40				40	35	
Link Distance (ft)		593				660	1203	
Travel Time (s)		10.3				15.0	23.4	
Confl. Peds. (#/hr)								4
Confl. Bikes (#/hr)			2					
Peak Hour Factor	0.98	0.98	0.98	0.84	0.84	0.84	0.98	0.98
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%
Adj. Flow (vph)	2	357	929	1	155	750	1133	163
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	359	929	0	156	750	1133	163
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	24	
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	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Number of Detectors	2	2	2	2	2	2	2	2
Detector Template								
Leading Detector (ft)	100	136	136	100	116	136	141	141
Trailing Detector (ft)	2	2	2	2	2	2	2	2
Detector 1 Position(ft)	2	2	2	2	2	2	2	2
Detector 1 Size(ft)	6	20	20	6	20	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel								
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94	130	130	94	110	130	135	135
Detector 2 Size(ft)	6	6	6	6	6	6	6	6
Detector 2 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 2 Channel								

Lanes, Volumes, Timings  
134: Richard Rd & Lk Hills Conn

05/28/2019

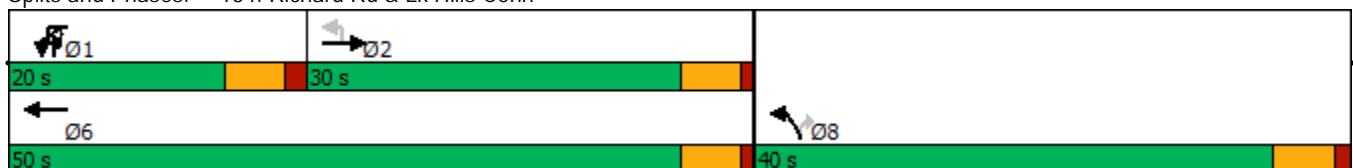


Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Free	Prot	Prot	NA	Prot	pm+ov
Protected Phases		2		1!	1	6	8	1!
Permitted Phases	2		Free					8
Detector Phase	2	2		1	1	6	8	1
Switch Phase								
Minimum Initial (s)	7.0	7.0		5.0	5.0	7.0	5.0	5.0
Minimum Split (s)	25.0	25.0		10.5	10.5	12.0	30.3	10.5
Total Split (s)	30.0	30.0		20.0	20.0	50.0	40.0	20.0
Total Split (%)	33.3%	33.3%		22.2%	22.2%	55.6%	44.4%	22.2%
Maximum Green (s)	25.0	25.0		14.5	14.5	45.0	34.7	14.5
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.1	4.0
All-Red Time (s)	1.0	1.0		1.5	1.5	1.0	1.2	1.5
Lost Time Adjust (s)		-2.0				-2.0	-2.0	-2.0
Total Lost Time (s)		3.0				3.0	3.3	3.5
Lead/Lag	Lag	Lag		Lead	Lead			Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0
Recall Mode	Min	Min		None	None	Min	None	None
Walk Time (s)	5.0	5.0					18.0	
Flash Dont Walk (s)	15.0	15.0					7.0	
Pedestrian Calls (#/hr)	1	1					2	
Act Effct Green (s)		14.6	67.4		12.5	30.7	30.1	42.4
Actuated g/C Ratio		0.22	1.00		0.19	0.46	0.45	0.63
v/c Ratio		0.49	0.59		0.48	0.46	0.73	0.16
Control Delay		27.0	1.6		32.6	14.3	19.4	1.7
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0
Total Delay		27.0	1.6		32.6	14.3	19.4	1.7
LOS		C	A		C	B	B	A
Approach Delay		8.7				17.4	17.2	
Approach LOS		A				B	B	

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 67.4  
 Natural Cycle: 70  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 14.1  
 Intersection LOS: B  
 Intersection Capacity Utilization 68.8%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 ! Phase conflict between lane groups.

Splits and Phases: 134: Richard Rd & Lk Hills Conn



Lanes, Volumes, Timings  
134: Richard Rd & Lk Hills Conn

05/28/2019



Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations		↑↑	↑		↓	↑↑	↑↑	↑
Traffic Volume (vph)	2	620	1310	1	310	430	900	120
Future Volume (vph)	2	620	1310	1	310	430	900	120
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		325		100		0	100
Storage Lanes	0		1		1		2	1
Taper Length (ft)	25				100		25	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	0.95	0.97	1.00
Ped Bike Factor			0.99					0.98
Frt			0.850					0.850
Flt Protected					0.950		0.950	
Satd. Flow (prot)	0	3574	1599	0	1770	3539	3467	1599
Flt Permitted		0.954			0.950		0.950	
Satd. Flow (perm)	0	3410	1579	0	1770	3539	3467	1570
Right Turn on Red			Yes					Yes
Satd. Flow (RTOR)			899					66
Link Speed (mph)		40				40	35	
Link Distance (ft)		593				660	1203	
Travel Time (s)		10.3				15.0	23.4	
Confl. Peds. (#/hr)								4
Confl. Bikes (#/hr)			2					
Peak Hour Factor	0.98	0.98	0.98	0.84	0.84	0.84	0.98	0.98
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%
Adj. Flow (vph)	2	633	1337	1	369	512	918	122
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	635	1337	0	370	512	918	122
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	24	
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	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Number of Detectors	2	2	2	2	2	2	2	2
Detector Template								
Leading Detector (ft)	100	136	136	100	116	136	141	141
Trailing Detector (ft)	2	2	2	2	2	2	2	2
Detector 1 Position(ft)	2	2	2	2	2	2	2	2
Detector 1 Size(ft)	6	20	20	6	20	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel								
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94	130	130	94	110	130	135	135
Detector 2 Size(ft)	6	6	6	6	6	6	6	6
Detector 2 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 2 Channel								



Lanes, Volumes, Timings  
134: Richard Rd & Lk Hills Conn

05/28/2019

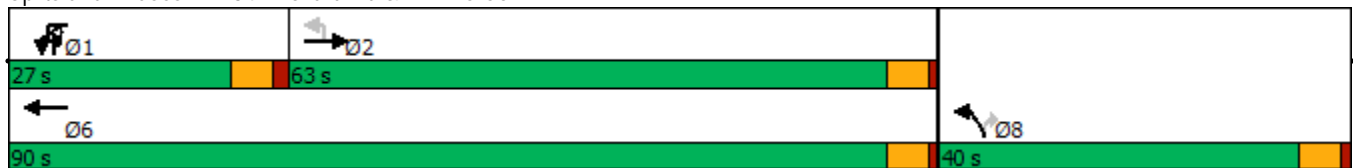


Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Free	Prot	Prot	NA	Prot	pm+ov
Protected Phases		2		1!	1	6	8	1!
Permitted Phases	2		Free					8
Detector Phase	2	2		1	1	6	8	1
Switch Phase								
Minimum Initial (s)	7.0	7.0		5.0	5.0	7.0	5.0	5.0
Minimum Split (s)	25.0	25.0		10.5	10.5	12.0	30.3	10.5
Total Split (s)	63.0	63.0		27.0	27.0	90.0	40.0	27.0
Total Split (%)	48.5%	48.5%		20.8%	20.8%	69.2%	30.8%	20.8%
Maximum Green (s)	58.0	58.0		21.5	21.5	85.0	34.7	21.5
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.1	4.0
All-Red Time (s)	1.0	1.0		1.5	1.5	1.0	1.2	1.5
Lost Time Adjust (s)		-2.0				-2.0	-2.0	-2.0
Total Lost Time (s)		3.0				3.0	3.3	3.5
Lead/Lag	Lag	Lag		Lead	Lead			Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0
Recall Mode	Max	Max		None	None	Max	None	None
Walk Time (s)	5.0	5.0					18.0	
Flash Dont Walk (s)	15.0	15.0					7.0	
Pedestrian Calls (#/hr)	0	0					2	
Act Effct Green (s)		60.0	129.8		23.5	87.0	36.5	59.8
Actuated g/C Ratio		0.46	1.00		0.18	0.67	0.28	0.46
v/c Ratio		0.40	0.85		1.16	0.22	0.94	0.16
Control Delay		24.1	5.9		146.9	8.5	63.8	9.4
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0
Total Delay		24.1	5.9		146.9	8.5	63.8	9.4
LOS		C	A		F	A	E	A
Approach Delay		11.7				66.6	57.4	
Approach LOS		B				E	E	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 129.8  
 Natural Cycle: 75  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.16  
 Intersection Signal Delay: 36.3  
 Intersection LOS: D  
 Intersection Capacity Utilization 70.1%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 ! Phase conflict between lane groups.

Splits and Phases: 134: Richard Rd & Lk Hills Conn



# MOVEMENT SUMMARY

 **Site: 6 [Lake Hills and Richards AM]**

New Site  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Richards											
3	L2	1133	1.0	0.535	10.7	LOS A	4.3	108.0	0.67	0.73	34.0
18	R2	163	1.0	0.535	5.2	LOS A	4.3	108.0	0.65	0.70	30.7
Approach		1296	1.0	0.535	10.0	LOS B	4.3	108.0	0.67	0.73	33.7
East: Lake Hills Conn											
1	L2	155	2.0	0.609	15.3	LOS A	3.8	95.9	0.81	0.99	31.7
6	T1	750	2.0	0.609	8.9	LOS A	4.1	104.5	0.81	0.90	35.7
Approach		905	2.0	0.609	10.0	LOS A	4.1	104.5	0.81	0.92	35.2
West: Lake Hills Conn											
2	T1	357	1.0	0.408	4.6	LOS A	3.2	81.1	0.44	0.48	37.4
12	R2	929	1.0	0.408	3.9	LOS A	3.2	81.1	0.12	0.46	37.5
Approach		1286	1.0	0.408	4.1	LOS A	3.2	81.1	0.21	0.46	37.4
All Vehicles		3486	1.3	0.609	7.8	LOS A	4.3	108.0	0.53	0.68	35.4

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Organisation: DKS ASSOCIATES | Processed: Monday, February 4, 2019 3:14:23 PM

Project: H:\(p) Projects\18\18112-002 Bellevue TO 2 Corridor Improvements (Reid Middleton)\Analysis\SIDRA\Future Build\Study Area 1\Future Build 3\20190204\_Study Area 1 Future Build 3.sip7

# MOVEMENT SUMMARY

 **Site: 6 [Lake Hills and Richards PM]**

New Site  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Richards											
3	L2	918	1.0	0.582	14.1	LOS A	6.1	154.4	0.92	0.95	33.1
18	R2	122	1.0	0.582	8.2	LOS A	6.1	154.4	0.92	0.91	29.7
Approach		1041	1.0	0.582	13.4	LOS B	6.1	154.4	0.92	0.95	32.8
East: Lake Hills Conn											
1	L2	369	2.0	0.565	13.9	LOS A	3.5	88.6	0.79	0.98	31.0
6	T1	512	2.0	0.565	7.5	LOS A	3.7	94.9	0.79	0.76	36.0
Approach		881	2.0	0.565	10.2	LOS B	3.7	94.9	0.79	0.85	34.2
West: Lake Hills Conn											
2	T1	633	1.0	0.672	7.1	LOS A	7.7	193.2	0.81	0.75	36.4
12	R2	1337	1.0	0.672	4.4	LOS A	7.7	193.2	0.14	0.50	37.3
Approach		1969	1.0	0.672	5.3	LOS A	7.7	193.2	0.35	0.58	37.0
All Vehicles		3891	1.2	0.672	8.6	LOS A	7.7	193.2	0.60	0.74	35.2

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: H:\(p) Projects\18\18112-002 Bellevue TO 2 Corridor Improvements (Reid Middleton)\Analysis\SIDRA\Future Build\Study Area 1\Future Build 3\20190204\_Study Area 1 Future Build 3.sip7



**APPENDIX D: OPINION OF PROBABLE CONSTRUCTION COSTS**





**City of Bellevue**  
**SE 8th St & 121st Ave SE - Alternative 1 Roundabout**  
Preliminary Opinion of Probable Construction Cost

<u>ITEM</u>	<u>QTY</u>	<u>UNIT</u>	<u>UNIT COST</u>	<u>COST</u>
<b>PREPARATION</b>				
Mobilization	1	LS	\$200,000	\$200,000
Construction Surveying	1	LS	\$50,000	\$50,000
Clearing & Grubbing	0.4	AC	\$50,000	\$20,000
<b>TRAFFIC CONTROL</b>				
Traffic Control	1	LS	\$325,000	\$325,000
<b>ROADWAY PREPARATION</b>				
Roadway Excavation Incl. Haul	4,100	CY	\$50	\$205,000
Gravel Borrow	2,800	TN	\$30	\$84,000
<b>ROADWAY SECTION</b>				
HMA Cl. 1/2 in. PG 58H-22	2,630	TN	\$130	\$341,900
Crushed Surfacing Base Course	2,780	TN	\$40	\$111,200
<b>STORM DRAINAGE</b>				
Stormwater Improvements	1	LS	\$204,800	\$204,800
<b>EROSION CONTROL</b>				
TESC	1	LS	\$31,000	\$31,000
<b>CURBING</b>				
Cement Conc. Curbs	2,650	LF	\$40	\$106,000
<b>STRIPING &amp; SIGNING</b>				
Channelization and Signing	1	LS	\$40,000	\$40,000
<b>ILLUMINATION</b>				
Illumination System	1	LS	\$200,000	\$200,000
<b>SIDEWALK &amp; RAMPS</b>				
Cement Conc. Sidewalk	1,370	SY	\$75	\$102,750
Cement Concrete Curb Ramps	6	EA	\$3,500	\$21,000
<b>OTHER ITEMS</b>				
Landscaping	970	SY	\$125	\$121,250
Miscellaneous Costs	1	LS	\$650,000	\$650,000

Subtotal	\$2,900,000
Contingency (30%)	\$900,000
<b>Total</b>	<b>\$3,800,000</b>

**City of Bellevue**  
**LHC & SE 8th St - Alternative 1 Modified Signal**

**Preliminary Opinion of Probable Construction Cost**

<u>ITEM</u>	<u>QTY</u>	<u>UNIT</u>	<u>UNIT COST</u>	<u>COST</u>
<b>PREPARATION</b>				
Mobilization	1	LS	\$65,000	\$65,000
Construction Surveying	1	LS	\$16,000	\$16,000
Clearing & Grubbing	0.1	AC	\$50,000	\$5,000
<b>TRAFFIC CONTROL</b>				
Traffic Control	1	LS	\$150,000	\$150,000
<b>GRADING</b>				
Roadway Excavation Incl. Haul	100	CY	\$50	\$5,000
Gravel Borrow	80	TN	\$30	\$2,400
<b>ROADWAY SECTION</b>				
Planing Bituminous Pavement	920	SY	\$8	\$7,360
HMA Cl. 1/2 in. PG 58H-22	110	TN	\$130	\$14,300
Crushed Surfacing Base Course	130	TN	\$40	\$5,200
<b>STORM DRAINAGE</b>				
Stormwater Improvements	1	LS	\$92,000	\$92,000
<b>EROSION CONTROL</b>				
TESC	1	LS	\$16,000	\$16,000
<b>CURBING</b>				
Cement Conc. Curbs	100	LF	\$40	\$4,000
<b>STRIPING &amp; SIGNING</b>				
Channelization and Signing	1	LS	\$2,640	\$2,640
<b>TRAFFIC SIGNAL</b>				
Traffic Signal	1	LS	\$300,000	\$300,000
<b>SIDEWALK &amp; RAMPS</b>				
Cement Conc. Sidewalk	0	SY	\$75	\$0
Cement Concrete Curb Ramps	6	EA	\$3,500	\$21,000
<b>OTHER ITEMS</b>				
Landscaping	0	SY	\$125	\$0
Miscellaneous/Unknown costs	1	LS	\$360,000	\$360,000

Subtotal \$1,070,000  
Contingency (30%) \$330,000  
**Total \$1,400,000**

**City of Bellevue**  
**LHC & SE 8th St - Alternative 2 Roundabout**

Preliminary Opinion of Probable Construction Cost

<u>ITEM</u>	<u>QTY</u>	<u>UNIT</u>	<u>UNIT COST</u>	<u>COST</u>
<b>PREPARATION</b>				
Mobilization	1	LS	\$350,000	\$350,000
Construction Surveying	1	LS	\$90,000	\$90,000
Clearing & Grubbing	0.8	AC	\$50,000	\$40,000
<b>TRAFFIC CONTROL</b>				
Traffic Control	1	LS	\$575,000	\$575,000
<b>ROADWAY PREPARATION</b>				
Roadway Excavation Incl. Haul	7,600	CY	\$50	\$380,000
Gravel Borrow	5,300	TN	\$30	\$159,000
<b>ROADWAY SECTION</b>				
HMA Cl. 1/2 in. PG 58H-22	5,440	TN	\$130	\$707,200
Crushed Surfacing Base Course	5,750	TN	\$40	\$230,000
<b>STORM DRAINAGE</b>				
Stormwater Improvements	1	LS	\$394,000	\$394,000
<b>EROSION CONTROL</b>				
TESC	1	LS	\$57,000	\$57,000
<b>CURBING</b>				
Cement Conc. Curbs	5,140	LF	\$40	\$205,600
<b>STRIPING &amp; SIGNING</b>				
Channelization and Signing	1	LS	\$80,000	\$80,000
<b>ILLUMINATION</b>				
Illumination System	1	LS	\$200,000	\$200,000
<b>SIDEWALK &amp; RAMPS</b>				
Cement Conc. Sidewalk	2,080	SY	\$75	\$156,000
Cement Concrete Curb Ramps	8	EA	\$3,500	\$28,000
<b>OTHER ITEMS</b>				
Landscaping	1,470	SY	\$125	\$183,750
Miscellaneous/Unknown Costs	1	LS	\$1,160,000	\$1,160,000

Subtotal	\$5,000,000
Contingency (30%)	\$1,500,000
<b>Total</b>	<b>\$6,500,000</b>

**City of Bellevue**  
**LHC & Richards Road - Alternative 1 Roundabout**  
Preliminary Opinion of Probable Construction Cost

<u>ITEM</u>	<u>QTY</u>	<u>UNIT</u>	<u>UNIT COST</u>	<u>COST</u>
<b>PREPARATION</b>				
Mobilization	1	LS	\$325,000	\$325,000
Construction Surveying	1	LS	\$80,000	\$80,000
Clearing & Grubbing	0.7	AC	\$50,000	\$35,000
<b>TRAFFIC CONTROL</b>				
Traffic Control	1	LS	\$525,000	\$525,000
<b>ROADWAY PREPARATION</b>				
Roadway Excavation Incl. Haul	7,100	CY	\$50	\$355,000
Gravel Borrow	4,500	TN	\$30	\$135,000
<b>ROADWAY SECTION</b>				
HMA Cl. 1/2 in. PG 58H-22	4,380	TN	\$130	\$569,400
Crushed Surfacing Base Course	4,630	TN	\$40	\$185,200
<b>STORM DRAINAGE</b>				
Stormwater Improvements	1	LS	\$420,000	\$420,000
<b>EROSION CONTROL</b>				
TESC	1	LS	\$53,000	\$53,000
<b>CURBING</b>				
Cement Conc. Curbs	3,000	LF	\$40	\$120,000
<b>STRIPING &amp; SIGNING</b>				
Channelization and Signing	1	LS	\$70,000	\$70,000
<b>ILLUMINATION</b>				
Illumination System	1	LS	\$200,000	\$200,000
<b>SIDEWALK &amp; RAMPS</b>				
Cement Conc. Sidewalk	2,150	SY	\$75	\$161,250
Cement Concrete Curb Ramps	8	EA	\$3,500	\$28,000
<b>OTHER ITEMS</b>				
Landscaping	2,190	SY	\$125	\$273,750
Miscellaneous/Unknown Costs	1	LS	\$1,000,000	\$1,000,000

Subtotal \$4,600,000  
Contingency (30%) \$1,400,000  
**Total \$6,000,000**

## APPENDIX E: PUBLIC COMMENTS

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# Rescheduled Open House

## Neighborhood Congestion Reduction Studies

March 2019

### SE 8th Street and Lake Hills Connector

The Transportation Department is evaluating improvements at the SE 8th Street and Lake Hills Connector intersection and seeks to hear about your travel experiences, answer questions you have about the study and receive your feedback on concept designs.

#### RESCHEDULED OPEN HOUSE

Tuesday, March 26, 2019

5:30–7:30 p.m.

Bellevue Botanical Garden

Education Center

12001 Main Street

Bellevue, WA 98005

#### Questions & Comments:

Contact Jun An, project manager, at 425-452-4230 or [jan@bellevuewa.gov](mailto:jan@bellevuewa.gov)

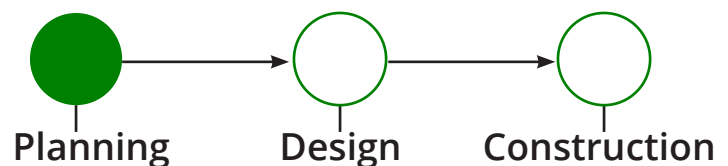
#### Intersection Study Areas:

As a part of the Neighborhood Safety, Connectivity and Congestion Levy, the city will evaluate how to improve traffic flow and safety at this intersection, which could also impact operations at nearby intersections:

- 121st Avenue SE and SE 8th Street and
- Richards Road and Lake Hills Connector  
(see map on reverse side)

Proposed improvements may include traffic signal modifications or roundabouts.

**Project Schedule:** Concept design alternatives will be presented at the Open House for feedback. A final design recommendation report and design concept will be completed in June 2019.



#### Neighborhood Safety, Connectivity and Congestion Levy project information:

[BellevueWA.gov/transportationlevy](http://BellevueWA.gov/transportationlevy)



Meetings are wheelchair accessible. Captioning, American Sign Language (ASL), or language interpreters are available upon request. Please phone at least 48 hours in advance 425-452-2064, [mjensen@bellevuewa.gov](mailto:mjensen@bellevuewa.gov). If you are deaf or hard of hearing, dial 711 (TR). Assisted listening device is available upon request. For questions or concerns regarding reasonable accommodations, contact City of Bellevue ADA/ Title VI administrator at 425-452-6168 (Voice).

Title VI Notice to the Public: It is the City of Bellevue's policy to assure that no person shall on the grounds of race, color, national origin or sex, as provided by the Title VI of the Civil Rights Acts of 1964, be excluded from participating in, be denied the benefits of, or be otherwise discriminated against under any of its federally funded program and activities. Any person who believes his/her Title VI protection has been violated may file a complaint with the Title VI Coordinator. For Title VI complaint forms and advice, please contact the Title VI Coordinator at 425-452-4496.

#### Information

정보  情報  
सूचना  資料

425-452-6800

సమాచారం Thông Tin

Información معلومات

اطلاعات Информация







**COMMENT SHEET**  
**SE 8<sup>th</sup> Street/Lake Hills Connector**  
**Intersection Study**  
**Open House**  
**March 26, 2019**



*Your input is valuable. Please add your comments, questions, concerns, and ideas about this study and leave this sheet with us tonight.*

Focus on Lake hills/SE 8th intersection, biggest bang for the buck.

other two not as bad.

Concern on 121st + SE 8th is WB traffic to freeway at rush hour would backup through Roundabout blocking traffic exiting SE 8 from turning WB easily.

Suggest extending 2 left turn lanes idea for LH connector further south even twice as long as depicted 3/26

Consider extending right turn pocket/lane from SB Lake hills Connector to SE 8th. Not shown currently

*Thank you for taking the time to provide your input.*

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—  
—

For more information about the project or to submit comments:  
**[BellevueWA.gov/transportationlevy](http://BellevueWA.gov/transportationlevy)**

**Jun An, project manager | 425-452-4230 | [jan@bellevuewa.gov](mailto:jan@bellevuewa.gov)**  
Bellevue Transportation Department  
PO Box 90012 | Bellevue WA | 98009-9012



COMMENT SHEET  
SE 8<sup>th</sup> Street/Lake Hills Connector  
Intersection Study  
Open House  
March 26, 2019



Your input is valuable. Please add your comments, questions, concerns, and ideas about this study and leave this sheet with us tonight.

Considered moving northbound leg of SE 8<sup>th</sup> Street at Lake Hills Connector to the east, to permit more than one lane turning west from northbound SE 8<sup>th</sup> Street. This work improve queue northbound traffic through the intersection to SE 7<sup>th</sup> Place.

Thank you for taking the time to provide your input.

Name: \_\_\_\_\_

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

For more information about the project or to submit comments:  
**BellevueWA.gov/transportationlevy**

Jun An, project manager | 425-452-4230 | jan@bellevuewa.gov  
Bellevue Transportation Department  
PO Box 90012 | Bellevue WA | 98009-9012





**COMMENT SHEET**  
**SE 8<sup>th</sup> Street/Lake Hills Connector**  
**Intersection Study**  
**Open House**  
**March 26, 2019**



Your input is valuable. Please add your comments, questions, concerns, and ideas about this study and leave this sheet with us tonight.

Thanks for the information -

① <sup>2 comments:</sup>  
121st at SE 9th

There has been discussion about development under the Wilburton trestle - at one point talk about a company that would have trucks coming in and out from under the trestle at another time talk of the City developing the area for access to the eventual bike trail across the bridge. Hoping the increased traffic that would come w/ development is being considered.

② SE 8th @ Lake Hills

There are students from the Int'l School who cross the intersection to get to the bus stop on the Lake Hills connector. I am concerned that a roundabout rather than a light might increase the risk that the kids aren't seen as they try to cross as cars approach a roundabout.

Thi

N

Cc

For more information about the project or to submit comments:  
[BellevueWA.gov/transportationlevy](http://BellevueWA.gov/transportationlevy)

Jun An, project manager | 425-452-4230 | [jan@bellevuewa.gov](mailto:jan@bellevuewa.gov)  
 Bellevue Transportation Department  
 PO Box 90012 | Bellevue WA | 98009-9012



**COMMENT SHEET**  
**SE 8<sup>th</sup> Street/Lake Hills Connector**  
**Intersection Study**  
**Open House**  
**March 26, 2019**



Your input is valuable. Please add your comments, questions, concerns, and ideas about this study and leave this sheet with us tonight.

- 1) Maybe double roundabout @ Richards Connector and SE 8<sup>th</sup> location
- 2) Fly overs for cars going straight & not getting on freeway
- 3) Pedestrian Overpasses @ Lake Hills SE 8<sup>th</sup>

Thank you for

Name: \_\_\_\_\_

Contact inform: \_\_\_\_\_

For more information about this project or to submit comments:  
[BellevueWA.gov/transportationlevy](http://BellevueWA.gov/transportationlevy)

**Jun An, project manager | 425-452-4230 | jan@bellevuewa.gov**  
 Bellevue Transportation Department  
 PO Box 90012 | Bellevue WA | 98009-9012





**COMMENT SHEET**  
**SE 8<sup>th</sup> Street/Lake Hills Connector**  
**Intersection Study**  
**Open House**  
**March 26, 2019**



*Your input is valuable. Please add your comments, questions, concerns, and ideas about this study and leave this sheet with us tonight.*

SE 8th + 121st -  
 ROUNDABOUT OK; HELPS KEEP TRAFFIC MOVING AFTER  
 EXITING 405 OR TURNING FROM LH CONNECTOR

SE 8th + LH CONNECTOR -  
 PLEASE NO ROUNDABOUT HERE. I'VE SEEN SO MANY  
 MESSSES AT THIS INTERSECTION. I THINK YOU NEED THE  
 LIGHTS TO CONTROL THE DRIVERS

RICHARDS / CONNECTOR  
 IM CAUSTIOS ABOUT THE ROUNDABOUT. LOTS OF SPEEDERS  
 GOING EASTBOUND ON THE CONNECTOR. MAY NEED LOTS  
 OF WARNING SIGNS - CAUTION CURVE AHEAD!

Thank \_\_\_\_\_ provide your input.

Name: \_\_\_\_\_

Contact \_\_\_\_\_ and/or address): \_\_\_\_\_

For more information about the project or to submit comments:  
[BellevueWA.gov/transportationlevy](http://BellevueWA.gov/transportationlevy)

Jun An, project manager | 425-452-4230 | [jan@bellevuewa.gov](mailto:jan@bellevuewa.gov)  
 Bellevue Transportation Department  
 PO Box 90012 | Bellevue WA | 98009-9012

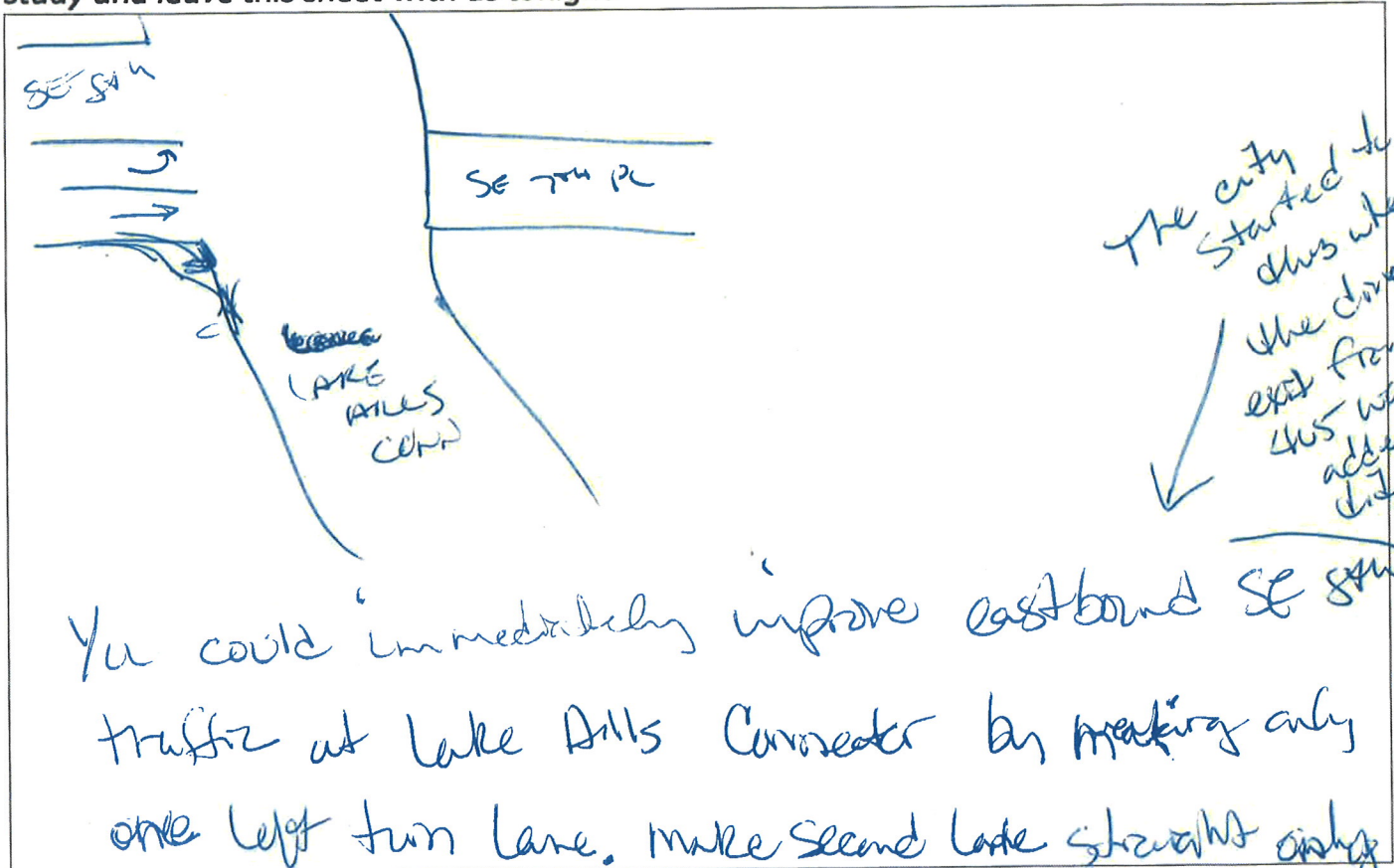


**COMMENT SHEET**  
**SE 8<sup>th</sup> Street/Lake Hills Connector**  
**Intersection Study**  
**Open House**  
**March 26, 2019**



Your input is valuable. Please add your comments, questions, concerns, and ideas about this study and leave this sheet with us tonight.

← 2  
 1/2



Your input is valuable. Please add your comments, questions, concerns, and ideas about this study and leave this sheet with us tonight.

Name: \_\_\_\_\_

Contact: \_\_\_\_\_

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[BellevueWA.gov/transportationlevy](http://BellevueWA.gov/transportationlevy)

Jun An, project manager | 425-452-4230 | [jan@bellevuewa.gov](mailto:jan@bellevuewa.gov)  
 Bellevue Transportation Department  
 PO Box 90012 | Bellevue WA | 98009-9012



**COMMENT SHEET**  
**SE 8<sup>th</sup> Street/Lake Hills Connector**  
**Intersection Study**  
**Open House**  
**March 26, 2019**



*Your input is valuable. Please add your comments, questions, concerns, and ideas about this study and leave this sheet with us tonight.*

- ① SE 8TH + LK HILLS CIRCLE IS INDEPENDENT FROM OTHER TWO CIRCLES = GOOD.
- ② SE 8TH EXPANDED TURN LANES + SIGNAL RECONFIG =
- ③ PEOPLE DO NOT CORRECTLY DRIVE IN TRAFFIC CIRCLES =
- IF ANY CIRCLE CREATED, NEED EDUCATION ALSO
- ④ CURRENT CONFIG WITH SIGNALS WORKS WELL
- ⑤ CIRCLE AT BOTTOM OF HILL COULD BE DANGEROUS! PEOPLE ALREADY SPEED DOWN HILL
- ⑥ CLARIFY IF CONFLICT DIAGRAM ILLUSTRATES TWO OR ONE LANE CIRCLE

GOOD  
BA

Thank you, *provide your input.*

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For more information about the project or to submit comments:  
**BellevueWA.gov/transportationlevy**

**Jun An, project manager | 425-452-4230 | jan@bellevuewa.gov**  
 Bellevue Transportation Department  
 PO Box 90012 | Bellevue WA | 98009-9012



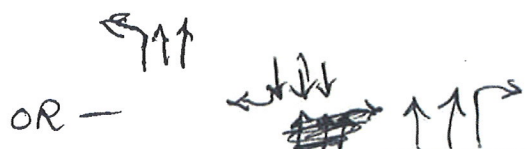


**COMMENT SHEET**  
**SE 8<sup>th</sup> Street/Lake Hills Connector**  
**Intersection Study**  
**Open House**  
**March 26, 2019**



Your input is valuable. Please add your comments, questions, concerns, and ideas about this study and leave this sheet with us tonight.

1. Need comprehensive traffic light coordination, not only at these 3 intersections discussed today.
2. The roundabouts seem to be a viable alternative to the traffic congestion at these sites.
3. Traffic would move faster if lanes in opposite directions moved at same time. Then both left-turn lanes in opposite directions could go.  
 OR —  
 all three lanes in one direction can go.



Thank you for taking the time to provide your input.

Name: \_\_\_\_\_

Contact \_\_\_\_\_ (or address): \_\_\_\_\_

For more information about the project or to submit comments:  
[BellevueWA.gov/transportationlevy](http://BellevueWA.gov/transportationlevy)

Jun An, project manager | 425-452-4230 | [jan@bellevuewa.gov](mailto:jan@bellevuewa.gov)  
 Bellevue Transportation Department  
 PO Box 90012 | Bellevue WA | 98009-9012

**From:** An, Jun Suk  
**To:** Carl Einfeld; Eric Shimizu  
**Subject:** FW: Congestion Reduction study -- SE 8th and Lake Hills Connector  
**Date:** Tuesday, March 12, 2019 11:17:22 AM

---

FYI

**From:** :t>  
**Sent:** Tuesday, March 12, 2019 11:07 AM  
**To:** An, Jun Suk <JAn@bellevuewa.gov>  
**Subject:** Congestion Reduction study -- SE 8th and Lake Hills Connector

Resending

**From:** '  
**Sent:** Friday, February 22, 2019 2:34 PM  
**To:** Jan@BellevueWA.gov  
**Subject:** Congestion Reduction study -- SE 8th and Lake Hills Connector

Feb. 22, 2019

Jun An, project manager Neighborhood Congestion Reduction Studies  
City of Bellevue Transportation Department  
P.O. Box 90012  
Bellevue, WA 98009

Dear Jun An:

We had planned to attend the Feb. 11 open house (canceled due to snow) about the SE 8th Street and the Lake Hills Connector and learn details of your planning process.

We have lived in the Wilburton neighborhood -- at the entrance to Kelsey Creek Park -- since 1987 and have had plenty of daily experience with the route! Instead of waiting for the rescheduled open house, here are our observations/concerns we planned to discuss:

**1. Please correct issues with the stoplight on west-bound SE 7th Place at the Lake Hills Connector. It creates horrid backups into our neighborhood.**

- The stoplight sensor cannot accurately calculate the traffic demand because it detects only two or three cars coming westbound -- the rest seem to be out of range due to SE 7th's immediate 90-degree southeast turn.
- During busy traffic times -- daily International School student shuttling, weekday morning commutes, park events, etc. -- we now often count **60+ cars** waiting to go westbound through the light. On wet evenings, it backs up SE 7th Place to 128th Ave. SE.
- With Google Maps and Waze sending an increasing volume of cars through our neighborhood on congested-traffic nights, we are seeing the situation get worse,

month by month. (The majority of those follow-the-direction drivers end up turning left – southbound – on the Lake Hills Connector.)

- During a recent snowstorm, the traffic to exit the neighborhood was backed up **MORE THAN A MILE** from the SE 7th/Lake Hills Connector stoplight -- up SE 7th to 128th, then north on 128th *and* 130th Place/Ave. SE beyond NE 2nd Street!!

**2. No matter what hour of the day, westbound SE 7th Place at the Lake Hills Connector would benefit hugely from a THREE-LANE exit from the Wilburton neighborhood:**

- One for *right-turn only*
- A *center lane for those going straight*, and,
- A *left-turn-only lane onto the southbound Lake Hills Connector – to address the tension described above.*

If three lanes are not possible, a left turn/straight lane and a right-turn-only lane would help.

**3. Safety for northbound drivers on the Lake Hills Connector would increase if there is a right-turn only/exit lane to Wilburton's SE 7th Street.**

- Most traffic zooming northbound is going 40 mph, trying to beat the stoplight and not watching for cars signaling to turn right on SE 7th Street. They also dive around the stopped buses in the right-hand lane, nearly colliding with people signaling for the turn to SE 7th.
- They also often are diving from the center lane to the right-hand lane to avoid idiots trying to take cuts into the left-turn only lane to westbound SE 8th.

**4. While traffic-signal and lane modifications for ALL traffic at the SE 7th/8th streets and Lake Hills Connector intersection are warranted, the use of a roundabout at this location seems a poor choice. (Note: We like roundabouts a lot – but they seem to work best when the volume and speed of all approaching traffic is fairly equal.)**

- A roundabout would thrust in front of our neighborhood entrance/exit the huge volume of northbound Lake Hills Connector traffic wanting to turn west on SE 8th to get to Interstate 405.
- A roundabout also would thrust this huge volume in front of the two southbound Lake Hills Connector traffic lanes going straight through the SE 8th intersection. Afternoon rush-hour drivers continuing on the Connector would have difficulty getting through the northbound masses circling west to I-405.
- It would be beneficial to have TWO left-hand turn lanes (vs. one) for the northbound Lake Hills Connector traffic turning west toward I-405.
  - The aforementioned left-turn lanes need to have a **curb** vs. just striping or "turtles". Too many jerks now drive nearly up to the SE 8th Street



intersection in the center "through" lane – then dive in to a gap in the left-turn traffic or stop dead in the center because their aggressive actions were thwarted by tightly spaced cars. This causes other through-traffic drivers to take evasive actions (see No. 3).

**5. The southbound Lake Hills Connector left-turn lane to SE 7th Place would benefit from a flashing yellow arrow.**

- When northbound and southbound lanes have green lights but no traffic is approaching we often have to wait and wait for a green arrow to proceed. In the evenings, this can be a 2+ minute wait with no other traffic visible.

**6. The 2-3 parking spots on the west side of the SE 7th Place where the Kelsey Creek Trailhead begins need to be moved elsewhere.**

- People park there to pick up International School students (since the trail connects to the back of the school) or while using the great trails. The parking/moving of the cars snarls traffic movement – and the aforementioned poorly functioning traffic light.

**7. Please retain the gravel turnaround area on north side of SE 7th Place east of the Lake Hills Connector.** *(We are not sure if it is owned by the city, power company or school district.)*

- It gets a lot of use by lost drivers (ranging from cars to big semis) who think SE 7th is the way to go east and are surprised by the road. If that lot wasn't there, they'd have to drive a few blocks east before they could turn around in the first cul-de-sac.
- If maintained, the lot could be used for people meeting their International School students, using the school fields, or hiking the trails.

**8. A roundabout at SE 8th and northbound 121st Ave. SE (exiting Woodridge) seems as if it would slow traffic to/from the freeway – and create issues for fire-station vehicles.**

- Drivers departing Woodridge to go westbound would have to navigate a large volume of eastbound traffic on SE 8th.

**9. Consider having drivers exiting Northbound I-405 intending to go eastbound on SE 8th Street be required to STOP when they reach SE 8th Street.** (They currently only must yield.)

- There is not good visibility of on-coming traffic – we regularly see drivers barely slowing at the bottom of the hill and nearly hitting eastbound SE 8th Street drivers -- obscured in the darkness under the freeway overpass – they didn't see.
- These drivers freely turning tend to glance east and sometimes then must slam on their brakes when they suddenly discover a fire crew departing or backing into the station.

**10. Please add signage to direct visitors to the Eastside Rail Corridor trail Wilburton Trestle attraction.** The trail is going to be a *huge* draw and signage is required. Non-local visitors intuitively are going to exit 405 down to SE 8th since that's where they see the trestle. Drivers also are going to think access is available from both ends – but no access will be allowed from the south. Signs are needed at:

- **The I-405 SE 8th exit** – telling them to stay left toward 116th (up higher).
- **Where the exit meets Lake Hills connector** (before it turns into 116th) telling them to turn left, vs. the intuitive right.
- **Eastbound SE 8th at 121st** – telling them to go straight, not south on 121st (because of no access on the Woodridge end).
- **Eastbound SE 8th and the Lake Hills Connector** – telling them to turn left (north) on the connector. (Intuitively, they will drive straight on to SE 7th place where they will find of use of our wonderful gravel turnaround!)

**11. As for the Richards Road and the Lake Hills Connector intersection, it works well most hours of the day. Northbound traffic does jam up some at rush-hours (and depending on the traffic) but is manageable with a bit of patience.**

**12. With all construction, please do your best to protect wetlands and the critical salmon stream.**

- Roundabouts seem like they would eat up more sensitive area.
- We enjoy the beaver colony east of the fire station along SE 8th; their persistence and construction activities are a hoot to watch. (*You probably don't want to add any post-construction trees along that stretch – odds are they'll be gnawed to stumps within a short time.*)

Please share this information with the appropriate people working on the project. If anyone has questions about our input, please feel free to contact us!

**From:** An, Jun Suk  
**To:**  
**Subject**  
**Date:** Monday, April 15, 2019 7:50:21 AM

---

FYI - public comment. I think he meant SE 8th and LHC.

-----Original Message-----

From:  
Sent: Thursday, April 4, 2019 6:03 PM  
To: An, Jun Suk <JAn@bellevuewa.gov>  
Subject: Roundabout on NE th

No to the roundabout proposed for NE 8th and the LH connector. Traffic moves fine there now. Roundabouts are expensive and confusing. They are especially bad ☹ in heavy traffic. I know they are trendy but studies do not validate increased throughput efficiency. Thanks for your help.

Sent from Xfinity Connect Application

**From:**  
**To:**  
**Subject:** FW: Roundabouts  
**Date:** Monday, April 15, 2019 1:33:43 PM

---

FYI - public comment

---

Sent: Friday, April 12, 2019 2:34 PM  
To: [jun@bellevuewa.gov](mailto:jun@bellevuewa.gov)  
Subject: Roundabouts

Hi Jun,

I have several questions about the proposed roundabouts proposed for SE 8th street. I live in Woodridge and feel that the roundabout will have serious effect on the main entrance to our neighborhood. Would you have time to meet to answer my questions? also, did your team coordinate with John Murphy and consider the results of his traffic study for the Woodridge hill? thanks for your attention to my concerns.

Sent from my iPhone

**From:** [An, Jun Suk](#)  
**To:** [Akers, Darcy](#); [Long, Chris](#); [Jensen, Marie](#); [Carl Einfeld](#)  
**Subject:** Fwd: SE 8th at the Lake Hills Connector Congestion Reduction Study  
**Date:** Thursday, April 4, 2019 9:08:54 PM

---

FYI

Get [Outlook for iOS](#)

---

**From:** J  
**Sent:** Thursday, April 4, 2019 7:44 PM  
**To:** An, Jun Suk  
**Subject:** Re: SE 8th at the Lake Hills Connector Congestion Reduction Study

Hello,

I would like to provide feedback regarding 2 different intersections found in the SE 8th Congestion Reduction Study.

#### SE 8th St & Lake Hills Connector

- ***I would like to retain*** the current configuration of using traffic lights at the intersection.
- ***I would also like to propose*** the addition of a flashing yellow left turn signal for the Northbound and Southbound traffic. This will help keep traffic moving at high traffic times and will reduce the wait time for turning vehicles when there is no traffic at all. This idea was tested roughly a year or more ago but was removed not too long after.
- ***I would reject the idea*** of having a round-about at this intersection. Traffic will be heavy during the afternoon rush hour. The intersection will have heavy traffic flowing into the intersection from all 4 directions, especially so in the north and southbound directions. This will make it difficult for eastbound traffic to turn towards the north or to continue to the east while westbound traffic will find it difficult to enter the circle in order to continue west or to the south.

#### SE 8th St. & 121st Ave SE

- ***I would accept the idea*** of a round-about at this intersection. Qualitatively speaking, I believe not that much westbound traffic enter into 121st Ave and would therefore not interrupt the oncoming eastbound traffic significantly. However, this also poses a potential threat for the traffic entering into 121st Ave since they would need to face the heavy oncoming eastbound traffic. Any eastbound traffic would not have any issues entering into 121st Ave. Northbound traffic leaving 121st Ave would not have too much trouble turning

eastbound since it is a right turn and they would have clear visibility of oncoming traffic. Traffic leaving 121st Ave would encounter some heavy oncoming traffic when making a left to travel westbound but once in the round-about, any westbound traffic on SE 8th would yield to traffic leaving 121st Ave anyways.





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