

228TH AVENUE CORRIDOR STUDY TRAFFIC ANALYSIS REPORT

(FINAL)

**Prepared for:
CITY OF SAMMAMISH, WASHINGTON**

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1.0 PROJECT OVERVIEW

The City of Sammamish, Washington contracted David Evans and Associates, Inc. to evaluate traffic operations on the 228th Avenue corridor, including intersection signal warrant analysis, intersection re-channelization/re-configuration, roundabout feasibility, flashing yellow left-turn arrows, U-turns, and corridor signal timing and phasing re-optimization. The analysis time periods include the AM and PM peak hours for the existing 2011 condition and the 2020 condition with the developments of the Town Center and recently proposed community center.

This report presents the methodology, findings, and conclusions regarding the traffic operational analysis for the 228th Avenue corridor. Mitigation options were recommended to improve the traffic operations of the deficient intersections.

2.0 METHODOLOGY AND ASSUMPTIONS

The existing counts at the intersections along the 228th Avenue corridor were collected in March and April of 2011. The 2020 forecast volumes in the PM peak hour were obtained from the available citywide 2020 PM travel demand model.

The 2020 citywide demand model includes the following land uses:

- Citywide pipeline concurrency developments
- Annexations adopted between 2009 and 2010
- Recently proposed Sammamish Community Center of 80,000 square feet
- Adopted Town Center plan with expanded commercial (2,000 residential units and commercial of 727,800 square feet)
- Background growth for areas outside the City up to 2020. The land use in 2020 for areas outside the City was interpolated from the available land use between 2006 and 2030 obtained from the City of Redmond, City of Issaquah, and PSRC models.

The 2020 citywide demand model also includes the funded 6-year transportation improvement program (TIP) projects. The 2020 AM volumes were estimated based on the ratios between the existing AM traffic counts and the existing PM traffic counts and the future 2020 PM volumes. The peak hour factors and heavy vehicle percentages obtained from the counts were applied into the 2020 scenarios for intersection level of service (LOS) analysis.

Sign control, signal control, and roundabout control options were evaluated at varied intersections along the 228th Avenue corridor. The LOS at un-signalized and signalized intersections was evaluated using the SYNCHRO program (Version 8), and the LOS of the roundabout option was evaluated using the aaSIDRA program (Version 5.1). Both the SYNCHRO program and aaSIDRA program incorporate the latest HCM 2010 LOS method.

3.0 INTERSECTION LOS DEFINITION AND STANDARDS

The 2010 Highway Capacity Manual (HCM 2010) methodology prepared by the Transportation Research Board (TRB) was used to calculate intersection LOS within the study area. LOS is a qualitative measure

describing operational conditions within a traffic stream and the perception thereof by road users. For signalized intersections, roundabouts, and sign control intersections, LOS is defined in terms of control delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. There are six LOS levels ranging from LOS A to LOS F, with LOS A representing the best operating conditions and LOS F the worst. Specifically, LOS criteria are stated in terms of the average vehicle control delay for a peak 15-minute analysis period, factored to a full hour, for the intersection or roundabout as a whole. Based on the new HCM 2010 LOS method, the LOS and delay criteria for roundabouts are the same as those for sign control intersections. **Table 1** provides LOS definitions for sign control intersections, roundabouts, and signalized intersections.

Table 1. Level of Service Definitions (HCM 2010)

Level of Service (LOS ¹)	Control Delay (seconds/vehicle)			Expected Delays
	Sign Control Intersections	Roundabouts	Signalized Intersections	
A	0-10	0-10	≤10	Little or no delay
B	>10-15	>10-15	>10-20	Short traffic delays
C	>15-25	>15-25	>20-35	Average traffic delays
D	>25-35	>25-35	>35-55	Long traffic delays
E	>35-50	>35-50	>55-80	Very long traffic delays
F	>50	>50	>80	Extremely long traffic delays

¹LOS F is assigned if the volume-to-capacity (v/c) ratio exceeds 1.0, regardless of the control delay.

For assessment of LOS at the approach and intersection level, LOS is based solely on control delay.

SOURCE: 2010 Highway Capacity Manual (TRB 2010)

In the City of Sammamish's Transportation Comprehensive Plan, the City developed an LOS standard to measure the overall transportation system's ability to move people and goods. LOS D is the level of service standard for the intersections along the 228th Avenue corridor.

4.0 STUDY AREA

The focus of this study is to assess traffic operations at the intersections along the 228th Avenue corridor. The intersections in the study area include the following:

- NE 28th Place-223rd Avenue NE/Sahalee Way NE
- NE Inglewood Hill Road-NE 8th Street/228th Avenue NE
- SE 8th Street/228th Avenue SE
- SE 20th Street/228th Avenue SE
- SE 24th Street/228th Avenue SE
- Issaquah-Pine Lake Road SE/228th Avenue SE

The following signalized intersections are not included in this study:

- NE 25th Way/228th Avenue NE
- NE 12th Place/228th Avenue NE
- NE 4th Street/228th Avenue NE
- E Main Street/228th Avenue NE
- SE 4th Street/228th Avenue SE
- SE 10th Street/228th Avenue SE
- SE 16th Street/228th Avenue SE

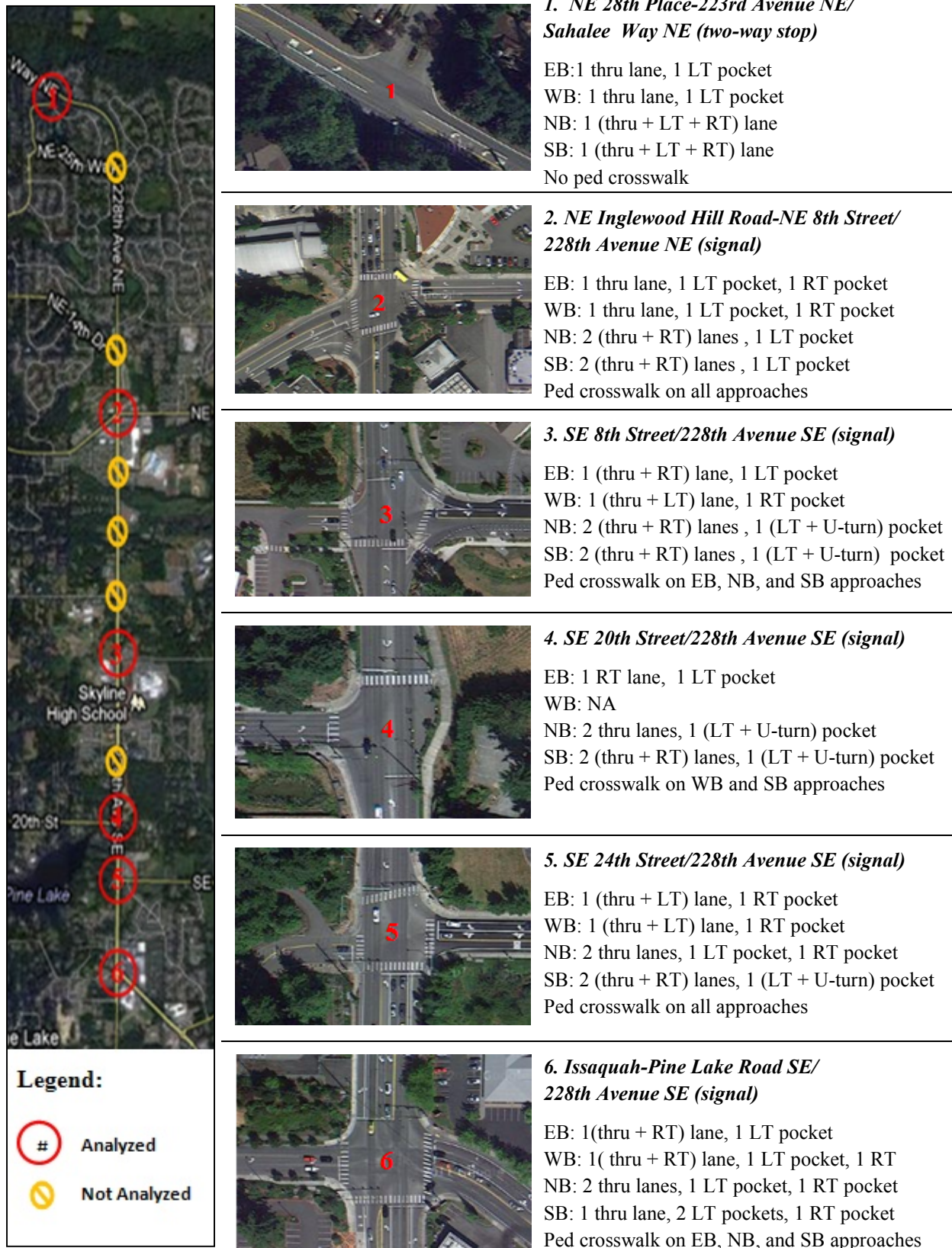
The 228th Avenue corridor between NE Inglewood Hill Road-NE 8th Street and Issaquah-Pine Lake Road SE is a 5-lane roadway arterial. The median lane provides space for a two-way left-turn lane, median landscape separation, and intersection left-turn/U-turn pockets at varied intersections. The 228th Avenue corridor north of NE Inglewood Hill Road-NE 8th Street tapers to a 3-lane roadway or a 2-lane roadway.

Various speed limits are posted on the 228th Avenue corridor. The speed limits on the corridor are described as follows:

- 40 miles per hour (mph), from the south city limit to the north of E Main Street at approximately 100 block
- 35 mph, from the north of E Main Street to NE 15th Street
- 45 mph, from NE 15th Street to the north city limit.

The study intersections and their configurations are shown in **Figure 1**.

Figure 1. Study Area Intersection and Configuration



5.0 SIGNAL WARRANT ANALYSIS RESULTS

The signal warrant analysis was conducted at the un-signalized intersection of NE 28th Place-223rd Avenue NE/ Sahalee Way NE for the AM and PM peak hours in the existing 2011 condition and the 2020 condition.

Standard A of Signal Warrant 3-Peak Hour described in Manual On Uniform Traffic Control Devices (MUTCD 2009 edition) was used to determine if a signal is warranted at the intersection of NE 28th Place-223rd Avenue NE/Sahalee Way NE in the 2011 and 2020 conditions. The following three criteria in Standard A must be met for a signal warrant:

- Stop delay ≥ 4 vehicle-hours for a one-lane approach, and
- Minor street approach volumes ≥ 100 vehicles/hour for one moving lane, and
- Total entering volumes > 800 vehicles/hour for a four-approach intersection

Table 2 shows the evaluation results. Signal warrant criteria are not met in either the AM or PM peak hours in both the 2011 and the 2020 conditions. However, two out of the three indicators in Signal Warrant 3 in 2020 AM peak hour are met and the 2nd indicator of Excessive Stopped Volumes is only one vehicle less than the criteria; therefore, it is likely Signal Warrant 3 will be met in the AM peak hour immediately after 2020. The signal warrant results are shown in **Appendix A**.

Table 2. Signal Warrant Evaluation Results

Signal Warrant 3: Peak Hour		Indicator Results			
		2011		2020	
Standard A Indicators	Criteria	AM	PM	AM	PM
Excessive Total Stopped Delay, and	≥ 4 vehicle-hours	3.2	0.5	6.5	0.9
Excessive Stopped Volumes, and	≥ 100 vehicles per hour	90	37	99	41
Excessive Entering Volumes	> 800 entering vehicles per hour	1,354	1,367	1,471	1,562
Signal warrant is met if all three criteria are met		Not Met	Not Met	Not Met	Not Met

6.0 INTERSECTION LEVEL OF SERVICE AND QUEUES

6.1 Intersection LOS

Intersection LOS was analyzed using the existing configuration and existing signal timing/phasing for both the existing 2011 and 2020 conditions. Next step was to optimize the signal timing/phasing to

evaluate sensitivity to intersection LOS by optimizing the signal timing/phasing for both the existing 2011 and 2020 conditions.

The following scenarios were developed for both the AM and PM peak hours based on intersection volumes, existing configurations, and signal timing optimization.

- **Scenario 1:** Existing Counts 2011 + Existing Configurations + Existing Signal Timing
- **Scenario 2:** Existing Counts 2011 + Existing Configurations + Optimized Signal Timing
- **Scenario 3:** Future Traffic 2020 + Existing Configurations + Existing Signal Timing
- **Scenario 4:** Future Traffic 2020+ Existing Configurations + Optimized Signal Timing

The only difference between **Scenario 1** and **Scenario 2** is the signal timing/phasing. Similarly, **Scenario 3** and **Scenario 4** have the same geometry and volumes except the different signal timing/phasing.

The above four scenarios were first evaluated to determine if LOS deficiencies are present at any intersections. Unsignalized and signalized intersections were evaluated using the SYNCHRO program and roundabout LOS was evaluated using the aaSIDRA program. Both the SYNCHRO program and aaSIDRA program incorporate the latest HCM 2010 LOS method.

Table 3 summarizes the intersection LOS and delay for the four scenarios in both the AM and PM peak hours for 2011 condition and 2020 conditions. Overall, **Scenarios 2** and **4** with signal timing optimization yield shorter delay compared to **Scenarios 1** and **3**, respectively, with existing signal timings.

In the 2011 condition, LOS deficiencies are present at two intersections. The intersection at NE 28th Place-223rd Avenue NE/Sahalee Way with two-way stop control on side streets operates at LOS E or LOS F due to heavy through traffic on Sahalee Way. The intersection at SE 24th Street/228th Avenue SE operates at LOS E in the PM peak hour with delay slightly higher than the threshold delay of 55 seconds for LOS D. Signal timing optimization did not change the intersection delay at the intersection of SE 24th Street/228th Avenue SE.

In the 2020 condition, LOS deficiencies appear at three intersections. The intersection at NE 28th Place-223rd Avenue NE/Sahalee Way continuously operates at LOS F with longer delay than that in the 2011 condition. The intersection at NE Inglewood Hill Road-NE 8th Street/228th Avenue SE operate at LOS F in the AM peak hour and LOS E in the PM peak hour in **Scenario 3** without signal optimization; and operates at LOS F in the AM peak hour in **Scenario 4** with signal optimization. The intersection at Issaquah-Pine Lake Road/228th Avenue SE operate at LOS E in the PM peak hours in **Scenarios 3** and **4**, without and with signal timing optimization.

The intersection LOS and delay for Scenarios 1-4 are shown in **Appendix B**.

Table 3. Intersection LOS (Delay¹) without Improvements

Intersection	LOS Standard	2011				2020			
		Scenario 1		Scenario 2		Scenario 3		Scenario 4	
		AM	PM	AM	PM	AM	PM	AM	PM
NE 28th Pl-223rd Ave NE/ Sahalee Way	D	F (127.1)	E (44.5)	F (127.1)	E (44.5)	F (235.0)	F (75.9)	F (235.0)	F (75.9)
NE Inglewood Hill Rd-NE 8th St/228th Ave NE	D	D (51.9)	C (34.2)	D (38.3)	C (27.9)	F (127.0)	E (63.4)	F (95.4)	D (47.0)
SE 8th St/ 228th Ave SE	D	C (21.8)	B (16.6)	B (13.3)	B (12.8)	C (20.7)	B (19.0)	B (13.1)	B (20.7)
SE 20th St/228th Ave SE	D	B (14.2)	B (12.3)	B (14.2)	B (12.3)	B (14.7)	B (14.5)	B (14.7)	B (14.4)
SE 24th St/ 228th Ave SE	D	C (22.1)	E (56.3)	C (22.6)	E (56.3)	C (21.3)	D (50.1)	C (21.3)	D (50.1)
Issaquah-Pine Lake Rd/ 228th Ave SE	D	D (42.9)	D (42.5)	D (41.3)	D (43.1)	E (76.5)	D (53.1)	E (68.1)	D (53.0)

¹Delay - control delay, seconds/vehicle

6.2 95th Percentile Queues

The 95th percentile queues were obtained from the SYNCHRO models. The 95th percentile queues in the AM and PM peak hours for the four scenarios are shown in **Table 4**. Overall, **Scenario 2** with signal timing optimization results in shorter queues compared to **Scenario 1** with the existing signal timing in the 2011 condition. Similarly, **Scenario 4** with signal timing optimization results in shorter queues compared to **Scenario 3** with existing signal timing in the 2020 condition.

In the 2011 condition with signal optimization, excessive 95th percentile queues are present on the following movements:

- WB and NB left-turn movements at NE Inglewood Hill Road-NE 8th Street/228th Avenue SE
- SB left-turn movement at SE 24th Street and 228th Avenue SE
- EB left-turn movement at Issaquah-Pine Lake Road/228th Avenue SE

In the 2020 condition with signal optimization, excessive 95th percentile queues are present on the following movements:

- WB, NB, and SB left-turn movements at NE Inglewood Hill Road/228th Avenue SE
- EB right-turn and NB left-turn/U-turn movement at SE 8th Street/228th Avenue SE
- NB left-turn movement at the intersection of SE 20th Street/228th Avenue SE
- SB left-turn movement at the intersection of SE 24th Street/228th Avenue SE
- EB and WB left-turn movements at the intersection of Issaquah-Pine Lake Road/228th Avenue SE

The 95th percentile queues for Scenarios 1-4 are shown in **Appendix B**.

Table 4. 95th Percentile Queues without Improvements

Intersection/Approach	Pocket Lengths	2011				2020			
		Scenario 1		Scenario 2		Scenario 3		Scenario 4	
		AM	PM	AM	PM	AM	PM	AM	PM
NE Inglewood Hill Rd-NE 8th St/ 228th Ave NE									
EB Left-turn	200	157	144	86	87	214	230	154	118
EB Right-turn	200	329	132	173	108	246	141	190	92
WB Left-turn	200	499	246	268	165	1451	782	721	387
WB Right-turn	200	19	38	15	30	60	47	30	30
NB Left-turn	200	326	321	225	258	264	318	267	158
SB Left-turn	200	176	243	108	188	250	538	277	302
SE 8th St/228th Ave SE									
EB Right-turn	25	14	17	11	12	22	75	40	51
WB Right-turn	100	46	34	37	26	45	30	37	21
NB Left-turn/U-turn	100	22	23	13	15	33	91	20	170
SB Left-turn/U-turn	100	32	67	19	64	15	29	9	38
SE 20th St/228th Ave SE									
EB Right-turn	100	15	62	15	62	14	80	14	74
NB Left-turn/U-turn	150	112	133	112	133	157	191	160	190
SB U-turn	150	0	9	0	9	0	6	0	6
SE 24th St/228th Ave SE									
EB Right-turn	80	4	16	4	16	3	9	3	9
WB Right-turn	150	53	45	53	45	55	47	55	47
NB Left-turn	180	11	24	11	24	9	21	9	21
NB Right-turn	320	26	75	26	75	28	81	28	81
SB Left-turn/U-turn	125	128	280	128	280	132	296	132	296
Issaquah-Pine Lake Rd/228th Ave SE									
EB Left-turn	100	91	143	90	157	240	421	205	314
WB Left-turn	300	207	165	202	180	345	240	369	209
NB Left-turn	125	55	64	56	69	80	81	101	74
NB Right-turn	150	37	83	35	96	42	73	39	60
SB Left-turn	300/400	195	331	200	336	244	383	229	398
SB Right-turn	100	37	33	33	32	0	0	0	0

7.0 IMPROVEMENT OPTIONS

Without physical geometry improvements, signal timing optimization could not result the LOS deficiencies or excessive queuing problems based on the above analysis. In order to resolve the LOS and queue deficiencies, several improvement options including roundabouts, signalization, signal timing and phasing optimization, flashing yellow left-turn arrows, U-turns, and turn pocket extension and or re-channelization were evaluated.

For roundabout option, two circulating lanes roundabouts were evaluated for the intersections at NE Inglewood Hill Road-NE 8th Street, SE 8th Street, SE 20th Street, SE 24th Street, and Issaquah-Pine Lane Road along the 228th corridor. One circulating lane roundabout was evaluated at NE 28th Street-223rd Avenue NE/Sahalee Way NE.

For signal option, signal optimization, flashing yellow left-turn arrow, U-turns, turn pockets extension, additions, and/or re-channelization were considered.

Scenarios 5 and 6 describe the improvements options:

- **Scenario 5: Existing Counts 2011 + Improvements + Optimized Timing (for signal option)**
Improvement options were tested for the deficient intersections that were identified from **Scenario 2** for the existing base condition after signal timing optimization. The improvement in **Scenario 5** will serve as short-term interim improvements to resolve the existing LOS and queue deficiencies.
- **Scenario 6: Future Traffic 2020 + Improvements + Optimized Timing (for signal option)**
Improvement options were tested for the deficient intersections that were identified from **Scenario 4** for the future baseline condition after signal timing optimization.

Tables 5 and 6 show the improvement option matrices in both the 2011 and 2020 conditions, respectively. The improvement options were weighted as Workable, Not Significant Change, and Not Preferred options.

Table 5. Intersection LOS/Queue Deficiencies and Improvements in 2011 AM and PM Peak Hours

Intersection /Movement	2011 LOS/Queueing				Scenario 5: Interim Improvement Options For 2011						
	Scenario 1		Scenario 2		Roundabout	Signal	Signal Optimization	Flashing Yellow Left Turn	U-Turn	Pocket Changed	Driveway Impact
	AM	PM	AM	PM							
NE 28th Pl-223rd Ave NE/ Sahalee Way NE	*	*	*	*	●	not warrant	○	○			
NE 8th St/228th Ave NE					●	○	○				
EB Left-turn											
EB Right-turn	#										
WB Left-turn	#	#	#					⊙	●	Extended	RI/RO at 2
WB Right-turn											
NB Left-turn	#	#	#	#				⊙	⊙	Extended	
SB Left-turn		#						⊙			
SE 8th St/228th Ave SE					○	○	○				
EB Right-turn											
WB Right-turn											
NB Left-turn/U-turn								○	○		
SB Left-turn/U-turn								○	○		
SE 20th St/228th Ave SE					○	○	⊙				
EB Right-turn											
NB Left-turn/U-turn								⊙	○		
SB U-turn									○		
SE 24th St/228th Ave SE		*		*	○	●	⊙				
EB Right-turn											
WB Right-turn											
NB Left-turn								⊙	⊙		
NB Right-turn											
SB Left-turn/U-turn	#	#	#	#				●	○	Extended	
Issaq-Pine Lk Rd/228th Ave SE Ave					○	○	⊙				
EB Left-turn		#		#				●	●	Extended	Minimal on
WB Left-turn								⊙	⊙		
NB Left-turn								●	●		
NB Right-turn											
SB Left-turn								●	⊙		
SB Right-turn											

RI/RO = Right in/Right out * = LOS deficiencies # = Queue longer than pocket length ○ = Workable ⊙ = Not Significant Change ● = Not Preferred

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Table 6. Intersection LOS/Queue Deficiencies and Improvements in 2020 AM and PM Peak Hours

Intersection /Movement	2020 LOS/Queueing				Scenario 6: Improvement Options for 2020						
	Scenario 3		Scenario 4		Roundabout	Signal	Signal Optimization	Flashing Yellow Left Turn	U-Turn	Pocket Changed	Driveway Impact
	AM	PM	AM	PM							
NE 28th Pl-223rd Ave NE/ Sahalee Way NE	*	*	*	*	●	not warrant	○	○			
NE 8th St/228th Ave NE	*	*	*		●	○	○				
EB Left-turn	#	#									
EB Right-turn	#										
WB Left-turn	#	#	#	#				⊙	●	Extended	RI/RO at 2
WB Right-turn											
NB Left-turn	#	#	#					⊙	⊙	Extended	
NB Right-turn										Added	
SB Left-turn	#	#	#	#				⊙		Extended	
SE 8th St/228th Ave SE					⊙	○	○				
EB Right-turn		#	#	#						Tolerated	
WB Right-turn											
NB Left-turn/U-turn				#				○	○	Extended	
SB Left-turn/U-turn								○	○		
SE 20th St/228th Ave SE					⊙	○	⊙				
EB Right-turn											
NB Left-turn/U-turn	#	#	#	#				⊙	○	Extended	
SB U-turn									○		
SE 24th St/228th Ave SE					○	○	⊙				
EB Right-turn											
WB Right-turn											
NB Left-turn								⊙	⊙		
NB Right-turn											
SB Left-turn/U-turn	#	#	#	#				●	○	Extended	
Issaq-Pine Lk Rd/228th Ave SE Ave	*		*		●	○	○				
EB Left-turn	#	#	#	#				●	●	Extended	Minimal on
WB Left-turn	#		#					⊙	⊙	Extended	
NB Left-turn								●	⊙		
NB Right-turn											
SB Left-turn								●	⊙		
SB Right-turn										(Thru +	Bus lane on S

RI/RO = Right in/Right out * = LOS deficiencies # = Queue longer than pocket length ○ = Favorable ⊙ = Neutral ● = Not favorable

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One circulating lane roundabout was tested at NE 28th Place-223rd Avenue NE/Sahalee Way and two-lane roundabout was tested at the study intersections along the 228th corridor between NE Inglewood Hill Road-NE 8th Street and Issaquah-Pine Lake Road. One circulating lane roundabout with one single-lane on each approach is not workable at the intersections of NE 28th Place-223rd Avenue NE/Sahalee Way due to its volume to capacity ratio (V/C) greater than 0.85, which is a recommended value in roundabout design guideline. Two-lane roundabout is not workable at NE Inglewood Hill Road-NE 8th Street/228th Avenue NE due to its V/C being equal to 0.85. Roundabout option is not favorable at SE 24th Street/228th Avenue SE and Issaquah-Pine Lake Road/228th Avenue SE due to their relatively high V/C, which is close to 0.85. Roundabout LOS/delay and volume-to-capacity ratio (V/C) for the 2011 condition are shown in **Table 7**.

Intersection LOS with interim improvements for 2011 for signalized control intersections are shown in **Table 7**. All signalized intersections operate at LOS D or better in 2011 AM and PM peak hours except LOS E with delay slightly higher than LOS D's delay threshold of 55 seconds present at SE 24th Street/228th Avenue SE in the PM peak hour. There are no major differences in terms of LOS for both the roundabout and signal options at SE 8th Street /228th Avenue SE and at SE 20th Street/228th Avenue SE, but the signal option has overall lower V/C. Based on the LOS analysis for 2011 condition, signal option is recommended for all study intersections.

Similarly, roundabout option is not favor at NE 28th Place-223rd Avenue NE/Sahalee Way, NE Inglewood Hill Road-NE 8th Street /228th Avenue NE , and Issaquah-Pine Lake Road/228th Avenue SE due to their V/C greater than 0.85 for the 2020 condition. All signalized intersections operate at LOS D or better in 2020 AM and PM peak hours. There are no major differences in terms of LOS for both the roundabout and signal options at SE 8th Street /228th Avenue SE and SE 20th Street /228th Avenue SE, but the signal option has overall lower V/C. Roundabout LOS and signalized intersection LOS for 2020 is shown in **Table 8**. Based on the LOS analysis for the 2020 condition, signal option is recommended for all study intersections.

The recommended signal option in both the 2011 and 2020 conditions will still result in excessive queues on some movements. Turn pockets with excessive queues at various intersections, which are detailed in **Table 9** for both the 2011 and 2020 conditions, were proposed to be extended to accommodate the 95th percentile queues to avoid the queue spilling back and blocking the through traffic.

The intersection LOS, delay, and 95th percentile queues for Scenarios 5-6 are shown in **Appendix C**. The roundabout LOS, delay, and 95th percentile queues for Scenarios 5-6 are shown in **Appendix D**.

Table 7. Intersection LOS/Delay¹ and Volume to Capacity Ratio in 2011 Scenario 5

Intersection	LOS Standard	2011 Scenario 5								Comments
		Roundabout Options				Signalized Options				
		AM		PM		AM		PM		
		LOS (Delay)	V/C	LOS (Delay)	V/C	LOS (Delay)	V/C	LOS (Delay)	V/C	
NE 28th Pl-223rd Ave NE /Sahalee Way NE	D	D (27.3)	0.96	C (16.1)	0.83	B (11.1)	0.72	A (7.8)	0.64	Roundabout option has V/C > 0.85, which is more critical for roundabout and it is not recommended.
NE Inglewood Hill Rd-NE 8th St /228th Ave NE	D	D (28.9)	0.85	B (10.6)	0.54	D (38.3)	0.88	C (27.9)	0.70	
SE 8th St /228th Ave SE	D	B (11.9)	0.54	B (14.4)	0.70	B (13.3)	0.62	B (12.8)	0.65	No major difference in terms of LOS for both options, but overall lower V/C for signal option. Signal option is recommended.
SE 20th St /228th Ave SE	D	C (15.1)	0.73	B (12.6)	0.66	B (14.2)	0.58	B (12.3)	0.49	
SE 24th St /228th Ave SE	D	C (16.7)	0.80	C (21.6)	0.83	C (22.6)	0.58	E (56.3)	0.75	Roundabout option has V/C close to 0.85. Signal option has LOS E but overall lower V/C. Signal option is recommended.
Issaquah-Pine Lake Rd /228th Ave SE	D	B (14.8)	0.72	C (19.9)	0.84	D (41.3)	0.79	D (43.1)	0.68	Roundabout option has V/C close to 0.85 and it is not recommended.

¹Delay - control delay, seconds/vehicle

Table 8. Intersection LOS/Delay¹ and Volume to Capacity Ratio in 2020 Scenario 6

Intersection	LOS Standard	2020 Scenario 6								Comments
		Roundabout Options				Signalized Options				
		AM		PM		AM		PM		
		LOS (Delay)	V/C	LOS (Delay)	V/C	LOS (Delay)	V/C	LOS (Delay)	V/C	
NE 28th Pl-223rd Ave NE /Sahalee Way NE	D	D (33.8)	1.01	D (32.4)	1.00	B (10.3)	0.76	A (6.7)	0.74	Roundabout option has V/C > 0.85, which is more critical for roundabout and it is not recommended.
NE Inglewood Hill Rd-NE 8th St /228th Ave NE	D	F (88.8)	1.33	D (26.2)	0.90	D (50.4)	0.90	C (31.6)	0.75	
SE 8th St/228th Ave SE	D	B (11.9)	0.53	C (16.4)	0.73	B (13.1)	0.57	C (20.7)	0.61	No major difference in terms of LOS for both options, but overall lower V/C for signal option. Signal option is recommended.
SE 20th St/228th Ave SE	D	B (13.7)	0.70	B (11.9)	0.65	B (14.7)	0.53	B (14.4)	0.45	
SE 24th St/228th Ave SE	D	B (13.2)	0.66	C (18.6)	0.81	C (20.0)	0.51	D (48.3)	0.73	
Issaquah-Pine Lake Rd /228th Ave SE	D	C (21.5)	0.95	C (20.4)	0.89	D (44.0)	0.77	D (52.4)	0.87	Roundabout option has V/C > 0.85. Signal option is recommended.

¹Delay - control delay, seconds/vehicle

Table 9. 95th Percentile Queues with Improvements

Intersection/Approach	Pocket Lengths (Feet)			2011 Scenario 5		2020 Scenario 6	
	Existing	2011 Scenario 5	2020 Scenario 6	AM	PM	AM	PM
NE 28th Pl-223rd Ave NE/ Sahalee Way NE							
EB Left-turn	100			5	5	5	5
WB Left-turn	100			3	5	2	6
NE Inglewood Hill Rd-NE 8th St/ 228th Ave NE							
EB Left-turn	200			86	87	105	100
EB Right-turn	200			173	108	138	74
WB Left-turn (LT + LT-Thru Shared in 2020)	200	275	375	268	165	354	189
WB Right-turn	200			15	30	9	15
NB Left-turn	200	275		225	258	190	190
NB Right-turn	0		100 (new)	-	-	34	73
SB Left-turn	200		325	108	188	182	304
SE 8th St/228th Ave SE							
EB Right-turn	25			11	12	40	51
WB Right-turn	100			37	26	37	21
NB Left-turn/U-turn	100		200	13	15	20	170
SB Left-turn/U-turn	100			19	64	9	38
SE 20th St/228th Ave SE							
EB Right-turn	100			15	62	14	63
NB Left-turn/U-turn	150		200	112	133	160	190
SB U-turn	150			0	9	0	6
SE 24th St/228th Ave SE							
EB Right-turn	80			4	16	3	20
WB Right-turn	150			53	45	55	47
NB Left-turn	180			11	24	9	21
NB Right-turn	320			26	75	8	29
SB Left-turn/U-turn	125	300	300	128	280	132	296
Issaq.-Pine Lake Rd/228th Ave SE							
EB Left-turn	100	175	325	90	157	212	314
WB Left-turn	300		375	202	180	354	209
NB Left-turn	125			56	69	81	74
NB Right-turn	150			35	96	44	60
SB Left-turn (double left)	300/400			200	336	248	398
SB Right-turn	100		0	33	32	-	-

Tables 10 and 11 summarize the recommended improvement options for **Scenarios 5** in 2011 condition and **Scenario 6** in 2020 condition. The 2011 improvement options were intended to be interim options in the short term. More improvements are needed in the 2020 condition.

In the 2020 condition, the eastbound and westbound split phasing at the intersection of NE Inglewood Hill Road-NE 8th Street/228th Avenue NE will create gaps to serve the traffic coming out from the new access to the Old Library on NE Inglewood Hill Road.

At the intersection of Issaquah-Pine Lake Road/228th Avenue SE, the sensitivity of the lane utilization was tested for the southbound two through lanes in the 2020 condition. The lane utilization is not very sensitive but the two through lanes on the southbound approach are necessary to resolve the intersection LOS deficiencies. Converting the bus only lane into the regular exiting lane on the south leg will have negligible impact on the bus service at the station because the headway for the only Bus Route 927 is approximately 60 minutes.

The flashing yellow left-turn arrow recommended in the study is adding flashing yellow left-turn arrow to the existing protective/permissive (prot/perm) left-turn phasing in the AM and PM peak hours or the left-turn permissive (perm) only phasing with a dedicated left-turn pocket.

Table 10. Recommended Interim Improvement Options for 2011 Scenario 5

Intersection	Roundabout Option	Signalization				
		Signal Option with or without Optimization	Other Features			
			Flashing Yellow Left-turn (FYLT)	U-turn on	Pocket Extended	Driveway Impact
NE 28th Pl-223rd Ave NE/ Sahalee Way NE	2-lane roundabout and 2-approach lanes on EB/WB is workable but right-of-way on Sahalee Way may constraint the roundabout option.	Works better although a signal warrant is not met in 2011 but will be met immediately after 2020.	Peak hours /Off-peak hours: FYLT on EB/WB with (w) left-turn permissive (Perm) only phasing	No U-turn	No changes	No driveway impact
NE Inglewood Hill Rd- NE 8th St/228th Ave NE	Not workable due to V/C ≥ 0.85 comparing to recommended V/C < 0.85 in design guideline.	With optimization is workable and better.	Peak hours: No FYLT on all approaches w Prot phasing Off-peak hours: FYLT on approaches w prot/perm phasing	No U-turn	WBLT $\rightarrow$ 275 ft; NBLT $\rightarrow$ 275 ft	Two RI/RO to the Highland shopping center on NE 8th Street
SE 8th St/228th Ave SE	Workable	With or without optimization is workable and better with lower V/C.	Peak hours/Off-peak hours: FYLT on NB/SB after solid LT arrow w Prot/Perm phasing.	NB/SB	No changes	No impacts
SE 20th St/228th Ave SE	Workable	With or without optimization is workable and better with lower V/C.	Peak hours: No FYLT on NB/SB w Prot phasing only Off-peak hours: FYLT on NB/SB w Prot/Perm phasing	NB/SB	No changes	No impacts
SE 24th St/228th Ave SE	Workable but V/C close to 0.85	With or without optimization has LOS E but overall lower V/C. Signal option is recommended.	Peak hours: No FYLT on NB/SB w Prot phasing only Off-peak hours: FYLT on NB/SB w Prot/Perm phasing	SB	SBLT $\rightarrow$ 300 ft	No impacts
Issaquah-Pine Lake Rd/ 228th Ave SE	Workable but V/C close to 0.85	With or without signal optimization is workable and better with lower V/C.	Peak hours: No FYLT on all approaches w Prot phasing Off-peak hours: FYLT on EB/WB w Prot/Perm phasing	No U-turn	EBLT $\rightarrow$ 175 ft	Minimal impact on transit accessing the P&R lot on the west leg

Table 11. Recommended Improvement Options for 2020 Scenario 6

Intersection	Roundabout Option	Signalization				
		Signal Option with or without Optimization	Other Features			
			Flashing Yellow Left-turn (FYLT)	U-turn on	Pocket Extended	Driveway Impact
NE 28th Pl-223rd Ave NE/ Sahalee Way NE	2-lane roundabout and 2-approach lanes on EB/WB is workable but right-of-way on Sahalee Way NE may constraint the roundabout option.	Works better although a signal warrant is not met in 2020 but will be met immediately after 2020.	Peak hours /Off-peak hours: FYLT on EB/WB with (w) left-turn permissive (Perm) only phasing	No U-turn	No changes	No driveway impact
NE Inglewood Hill Rd- NE 8th St/228th Ave NE	Not workable due to V/C > 0.85 comparing to recommended V/C < 0.85 in design guideline.	With optimization and split EB/WB phasing is workable.	Peak hours: No FYLT on NB/SB w Prot phasing only Off-peak hours: FYLT on NB/SB w Prot/Perm phasing	No U-turn	New NB RT → 100ft; Double WB LT, WBLT → 375 ft; SBLT → 325 ft	RI/RO at old library access to 228th Ave NE; Two RI/RO to the Highland shopping center on NE 8th St
SE 8th St/228th Ave SE	Workable	With optimization is workable better with lower V/C.	Peak hours/Off-peak hours: FYLT on NB/SB after solid LT arrow w Prot/Perm phasing	NB/SB	NBLT → 200 ft	No impacts
SE 20th St/228th Ave SE	Workable	with or without optimization is workable and better with overall lower V/C.	Peak hours: No FYLT on NB/SB w Prot phasing only Off-peak hours: FYLT on NB/SB w Prot/Perm phasing	NB/SB	NBLT → 200 ft	No impacts
SE 24th St/228th Ave SE	Workable but V/C close to 0.85.	With or without optimization has LOS E but overall lower V/C. Signal option is recommended.	Peak hours: No FYLT on NB/SB w Prot phasing only Off-peak hours: FYLT on NB/SB w Prot/Perm phasing	SB	SBLT → 300 ft	No impacts
Issaquah-Pine Lake Rd/ 228th Ave SE	Not workable due to V/C > 0.85	With optimization is workable and better.	Peak hours: No FYLT on all approaches w Prot phasing Off-peak hours: FYLT on EB/WB w Prot/Perm phasing	No U-turn	SBRT → Thru + RT shared lane; EBLT → 325 ft; WBLT → 375 ft	Two exiting lanes on south leg, occupying the current bus lane; minimal impact on transit accessing P&R on west leg

8.0 FLASHING YELLOW LEFT-TURN SAFETY

A flashing yellow left-turn arrow indicates that left-turn traffic is permitted but not protected; therefore, drivers must stop first, yield to oncoming traffic and pedestrians, and then proceed through the intersection with caution. When the time for the flashing yellow arrow ends, the solid yellow left-turn arrow starts. The solid yellow means that the left-turn signal is about to turn red, and drivers should prepare to stop, or prepare to complete their left turn if they are in the intersection.

A flashing yellow left-turn arrow is introduced to minimize the misunderstanding of the solid green signal as a left-turn indicator. A solid green signal means “go” for through traffic, but drivers making a left turn on a solid green light sometimes do not realize they have to yield to oncoming traffic, which could result in potential collisions. The flashing yellow arrow allows left turns but at the same time communicates the “yield and caution” message to drivers. The flashing yellow left-turn arrow is especially effective at intersections with small to moderate traffic volumes and with collision history during a non-rush hour.

The flashing yellow left-turn arrow recommended in the study is adding flashing yellow left-turn arrow to the existing protective/permissive left-turn phasing in the AM and PM peak hours or the left-turn permissive only phasing with a dedicated left-turn pocket. The flashing yellow left-turn arrow will be turned on after a solid green left-turn arrow and a solid yellow interval for protective/permissive left-turn phasing. For the left-turn permissive only phasing, the flashing yellow left-turn arrow will be turned on at the same time as the solid green for the adjacent through movement on the same direction. For the protected only left-turn phasing in the peak hours, they can be changed to protective/permissive phasing (solid green left-turn arrow + solid yellow interval + flashing yellow left-turn arrow) during off-peak hours to better response to the light traffic condition.

9.0 ADAPTIVE TRAFFIC CONTROL BENEFITS

Another alternate method to relieve traffic congestion is to install an adaptive traffic control system along the 228th Avenue corridor. An adaptive traffic control system is defined as a system that can adjust splits, cycle lengths and offset based on the real time traffic volumes. It combines an optimization methodology of global arterial signal coordination with a powerful and agile local intersection optimization algorithm to both maximize and guarantee arterial progression while reducing side street and left turn delay. Cameras or other detectors are used to automatically capture the real-time traffic volumes and then the timing split is optimized to keep the traffic moving efficiently. The system also communicates with the adjacent signals and informs them about the approaching vehicles. It is proved that an adaptive control system can significantly reduce delay and improve corridor’s speed.

For example, the City of Bellevue, Washington has installed the SCATS (Sydney Coordinated Adaptive Traffic System) traffic control system in its city’s corridors since 2010. The City of Bellevue has installed the SCATS system for 31 intersections in Bellevue Downtown and Factoria areas in Phase I at the costs of \$630,000 and for 31 intersections in Bellevue Downtown corridors, Bellevue Overlake Hospital District, and Bellevue 116th Avenue corridor in Phase II at the costs of \$479,000. The City of Bellevue achieved the objectives of the system’s implementation by reducing delays for vehicles and pedestrians, adapting quickly to changing traffic conditions and lowering signal cycle lengths when possible. The City of Bellevue has reported the SCATS program including the flashing yellow left-turn arrow, which allows

left turns after yielding to pedestrians and oncoming through traffic, has reduced the left-turn delay from 38 seconds per vehicle to 16 seconds per vehicle at Factoria Boulevard/Newport Way.

The 228th Avenue corridor is a north-south arterial with three high schools in close proximity and special events such as farmer market during summer time along the corridor. Traffic conditions and traffic patterns vary during a typical weekday and weekend or summer time based on the 2011 counts along the corridor. During a typical weekday, the AM peak hours usually fall between 7:00 - 8:00 AM and the PM peak hours usually fall between 3:00 - 6:00 PM. The peak traffic spread longer periods in the afternoon due to school dismissed early. The southbound traffic in the morning peak hours dominates and the northbound traffic in the afternoon peak hours dominates. During a typical weekend, traffic usually peaks between 10 AM – 2 PM. The off-peak traffic ranges from as low as 5 percent to 90 percent of the peak hour traffic during a day. It appears that one to three signal cycle plans cannot efficiently response to the traffic variations during the day. An adaptive traffic control system would efficiently response to the traffic variations during a weekday and weekend by adjusting the signal cycle lengths and allowing left-turn traffic (by turning on flashing yellow left-turn arrow) when traffic is light during off-peak hours and weekends. Further study and research, such as best practice and lessons learned from the City of Bellevue, Washington or other jurisdictions, may be needed to layout a detailed plan for adopting the adaptive traffic control system.

10.0 LIMITATION

The analysis was prepared for the AM and PM peak hour periods based on the limited count data and model forecasts. Additional off-peak periods should be analyzed to capture the traffic variation in the traffic flow. In addition, the other signalized intersections such as at NE 25th Way, NE 12th Place, NE 4th Street, E Main Street, SE 4th Street, SE 10th Street, and SE 16th Street along the 228th Avenue were not included in the analysis; therefore, signal timing optimization and progression along the 228th Avenue corridor may not be optimum.

11.0 CONCLUSIONS

A signal warrant is not met at the intersection of NE 28th Place-223rd Avenue NE/Sahalee Way in the AM and PM peak hours in both the 2011 condition and the 2020 condition, but will be met immediately in the AM peak hour after 2020.

In the 2011 condition without improvements, LOS deficiencies are present at two intersections (NE 28th Place-223rd Avenue NE/Sahalee Way and SE 24th Street/228th Avenue SE). In the 2020 condition without improvements, three intersections (NE 28th Place-223rd Avenue NE/Sahalee Way, NE Inglewood Hill Rd- NE 8th Street/228th Avenue SE, and Issaquah-Pine Lake Road/228th Avenue SE) operate at LOS E or LOS F, which do not meet the City's LOS standard of LOS D.

In addition to LOS deficiencies, excessive 95th percentile queues are present in the 2011 condition at three intersections (NE Inglewood Hill Road-NE 8th Street/228th Avenue SE, SE 24th Street/228th Avenue SE, and Issaquah-Pine Lake Road/228th Avenue SE). In the 2020 condition, excessive 95th percentile queues are present at NE Inglewood Hill Road-NE 8th Street/228th Avenue SE, SE 8th Street/228th Avenue SE, SE 20th Street/228th Avenue SE, SE 24th Street/228th Avenue SE, and Issaquah-Pine Lake Road/228th Avenue SE.

Varied improvement options including roundabout, signal, signal timing and phasing optimization, flashing yellow left-turns, U-turns, and turn pocket extension, addition and/or re-channelization were tested to resolve intersection LOS deficiencies and queue problems.

Roundabout option is not workable at NE 28th Place-223rd Avenue NE/Sahalee Way and NE Inglewood Hill Road-NE 8th Street/228th Avenue NE in 2011 due to their V/C greater than 0.85, which is a recommended value in roundabout design guideline. Roundabout option is not favorable at SE 24th Street/228th Avenue SE and Issaquah-Pine Lake Road/228th Avenue SE due to their relatively high V/C, which is close to 0.85. There are no major differences in terms of LOS for both the roundabout and signal options at SE 8th Street /228th Avenue SE and SE 20th Street /228th Avenue SE, but the signal option has overall lower V/C.

All signalized intersections operate at LOS D or better in 2011 AM and PM peak hours except LOS E with delay slightly higher than LOS D's delay threshold of 55 seconds present at SE 24th Street/228th Avenue SE in the PM peak hour. Signal option is recommended for all study intersections in the 2011 condition.

Similarly, roundabout option is not favor at NE 28th Place-223rd Avenue NE /Sahalee Way, NE Inglewood Hill Road-NE 8th Street/228th Avenue NE , and Issaquah-Pine Lake Road/228th Avenue SE due to their V/C greater than 0.85 for the 2020 condition. There are no major differences in terms of LOS for both the roundabout and signal options at SE 8th Street /228th Avenue SE and SE 20th Street/228th Avenue SE, but the signal option has overall lower V/C. All signalized intersections operate at LOS D or better in 2020 AM and PM peak hours. Signal option is recommended for all study intersections in the 2020 condition.

In the 2011 condition, turn pockets were proposed to be extended to accommodate the queues at three intersections (NE Inglewood Hill Road-NE 8th Street/228th Avenue NE, SE 24th Street/228th Avenue SE, and Issaquah-Pine Lake Road/228th Avenue SE).

Turn pockets were proposed to be added or be extended or re-channelized to accommodate the 95th percentile queue lengths by utilizing the two-way left-turn lane or the median landscape separation at all study intersections except NE 28th Place-223rd Avenue NE/Sahalee Way in the 2020 condition. At NE Inglewood Hill Road-NE 8th Street/228th Avenue NE, a northbound right-turn pocket will be added and double left-turn pockets (one left-turn pocket and one left-turn and through shared lane) will be re-channelized on the east leg. At Issaquah-Pine Lake Road/228th Avenue SE, the southbound right-turn lane will be re-channelized as through and right-turn shared lane; the bus only lane on the south leg will be converted to a regular exiting.

Flashing yellow left-turn arrows, which are adding to the existing protective/permissive phasing (flashing yellow left-turn arrow turns on after solid green left-turn arrow and solid yellow interval) or to the left-turn permissive phase only with a dedicated left-turn pocket, work better for small to moderate left-turn volumes with moderate opposing through traffic volumes. When left-turn volumes are relatively high (larger than 200) and the product of the through opposing volumes and the left-turn volumes greater than 50,000 for one through lane or 10,000 for two or more through lanes, left-turn protected only phasing is justified, because there would not be enough gaps for left-turning traffic to make a left-turn during the

flashing yellow period (permissive phasing period). Flashing yellow left-turn arrow (protective/permissive or permissive only) operates more effectively during non-peak hours.

U-Turns at intersections are allowed to serve traffic from right-in/right-out driveways along the 228th Avenue corridor. The existing U-Turns will remain.

The recommended improvement options in 2020 are described for each intersection on the following pages.

Sahalee Way NE / NE 28th Pl

Proposed Improvements in 2020:

- Signalization would resolve LOS deficiencies, but signal warrant is not met
- A single-lane roundabout with two WB approach lanes would work



NE Inglewood Hill Rd / 228th Ave NE

Proposed Improvements in 2020:

- Re-optimize and EB/WB split phase
- Double left on WB (LT, Thru+LT)
- Extend NB, WB, and SB LT pockets.
- Add NB RT pocket (new, not re-channelization of the through lanes)
- RI/RO control on NE 8th St and on 228th Ave NE
- Full access on Inglewood Hill Rd to old library



SE 8th St / 228th Ave SE

Proposed Improvements in 2020:

- Re-optimize
- Extend NB LT pocket





SE 24th St / 228th Ave SE

Proposed Improvements in 2020:

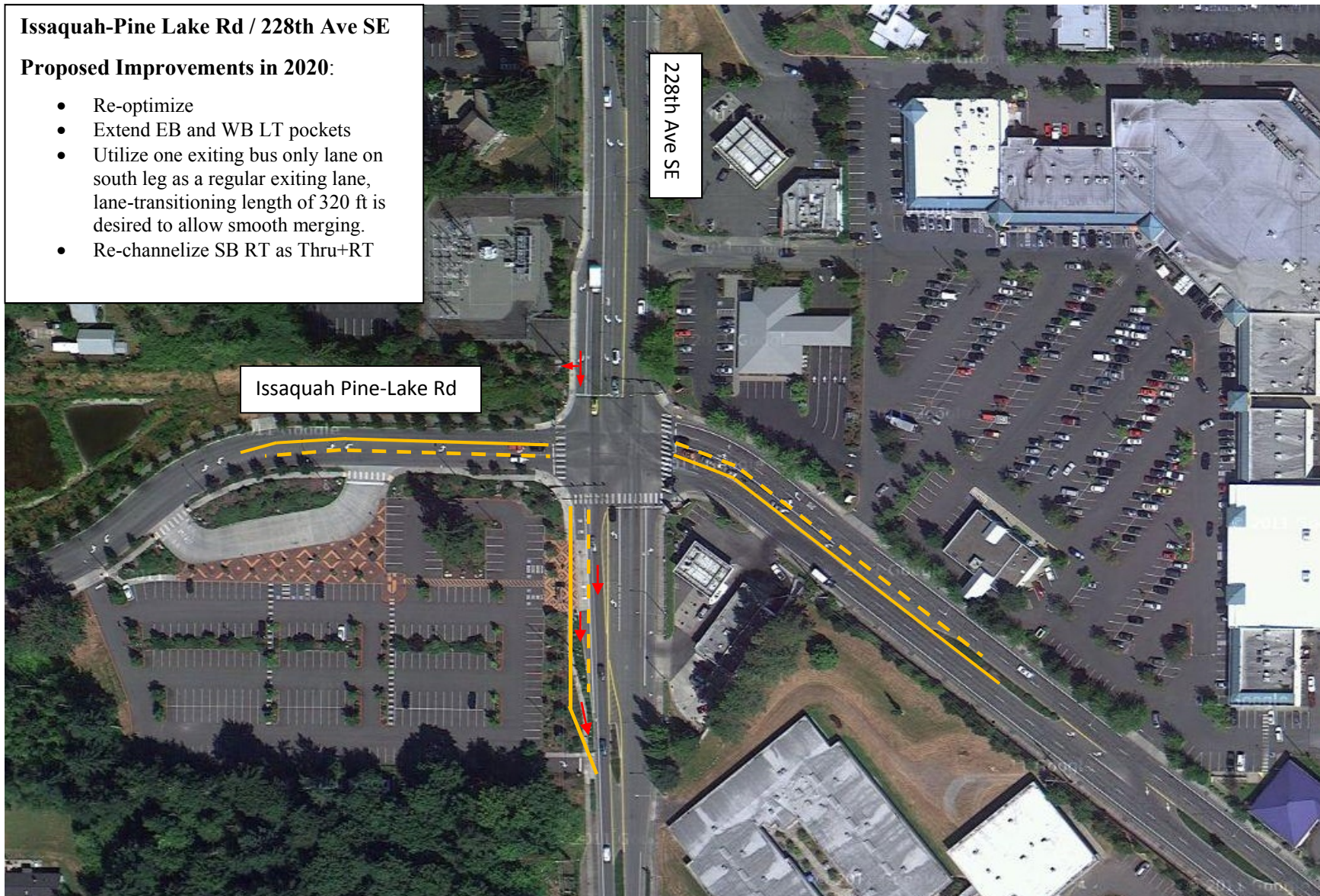
- Extend SB LT pocket



Issaquah-Pine Lake Rd / 228th Ave SE

Proposed Improvements in 2020:

- Re-optimize
- Extend EB and WB LT pockets
- Utilize one exiting bus only lane on south leg as a regular exiting lane, lane-transitioning length of 320 ft is desired to allow smooth merging.
- Re-channelize SB RT as Thru+RT



APPENDIX A – 2011 AND 2020 SIGNAL WARRANT ANALYSIS RESULTS

Warrant 3: Peak Hour

Location: Sahalee Way & 223rd Ave NE/28th Place

2011 Existing AM

Driveway for
any of the
following:

Office Complex?
Manufacturing Plant?
Industrial Complex?
High-Occupancy Facility?
Unusual Case?

No

No

No

No

No

Total Stopped Delay (vehicle-hours):

3.2

Criteria A:

Excessive Total Stopped Delay? (> 4 vehicle-hours ?)
Excessive Stopped Volume? (> 100 vehicles per hour ?)
Excessive Entering Volume? (> 800 vehicles entering ?)

Fails Criteria

Fails Criteria

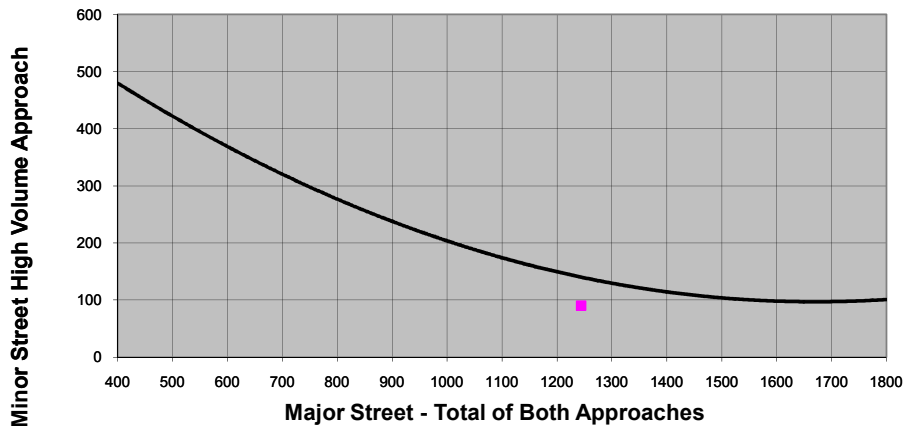
Meets Criteria

Criteria B:

Volumes fall above the applicable curve in Figure 4C-3 (or Figure 4C-4, if applicable)?

No (Yes or No)

FIGURE 4C-3: Warrant 3, Peak Hour



Fails to Satisfy Warrant 3

Warrant 3: Peak Hour

Location: Sahalee Way & 223rd Ave NE/28th Place

2011 Existing PM

Driveway for
any of the
following:

Office Complex?
Manufacturing Plant?
Industrial Complex?
High-Occupancy Facility?
Unusual Case?

No

No

No

No

No

Total Stopped Delay (vehicle-hours):

0.5

Criteria A:

Excessive Total Stopped Delay? (> 4 vehicle-hours ?)
Excessive Stopped Volume? (> 100 vehicles per hour ?)
Excessive Entering Volume? (> 800 vehicles entering ?)

Fails Criteria

Fails Criteria

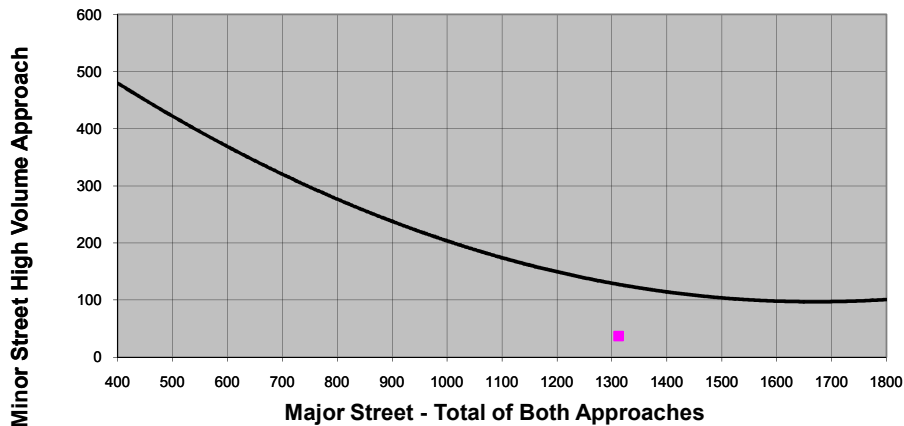
Meets Criteria

Criteria B:

Volumes fall above the applicable curve in Figure 4C-3 (or Figure 4C-4, if applicable)?

No (Yes or No)

FIGURE 4C-3: Warrant 3, Peak Hour



Fails to Satisfy Warrant 3

Warrant 3: Peak Hour

Location: Sahalee Way & 223rd Ave NE/28th Place

2020 AM

Driveway for
any of the
following:

Office Complex?
Manufacturing Plant?
Industrial Complex?
High-Occupancy Facility?
Unusual Case?

No
No
No
No
No

Total Stopped Delay (vehicle-hours): 6.5

Criteria A:

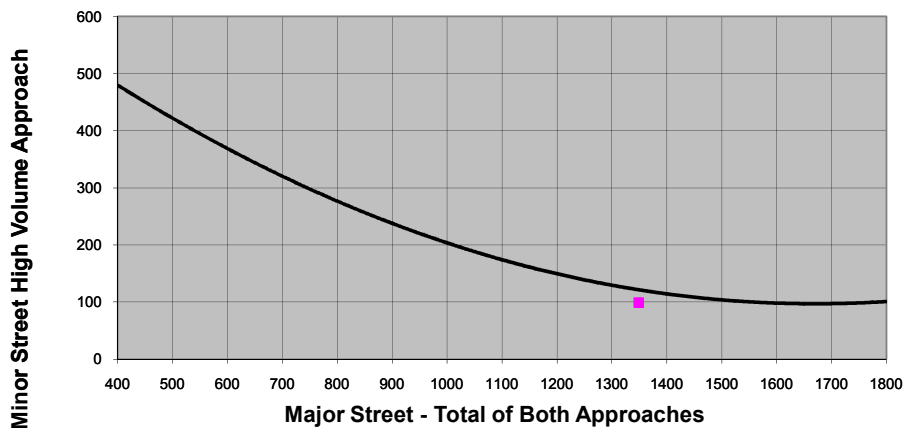
Excessive Total Stopped Delay? (> 4 vehicle-hours ?)
Excessive Stopped Volume? (> 100 vehicles per hour ?)
Excessive Entering Volume? (> 800 vehicles entering ?)

Meets Criteria
Fails Criteria
Meets Criteria

Criteria B:

Volumes fall above the applicable curve in Figure 4C-3 (or Figure 4C-4, if applicable)?
No (Yes or No)

FIGURE 4C-3: Warrant 3, Peak Hour



Fails to Satisfy Warrant 3

Warrant 3: Peak Hour

Location: Sahalee Way & 223rd Ave NE/28th Place

2020 PM

Driveway for
any of the
following:

Office Complex?
Manufacturing Plant?
Industrial Complex?
High-Occupancy Facility?
Unusual Case?

No
No
No
No
No

Total Stopped Delay (vehicle-hours): 0.86

Criteria A:

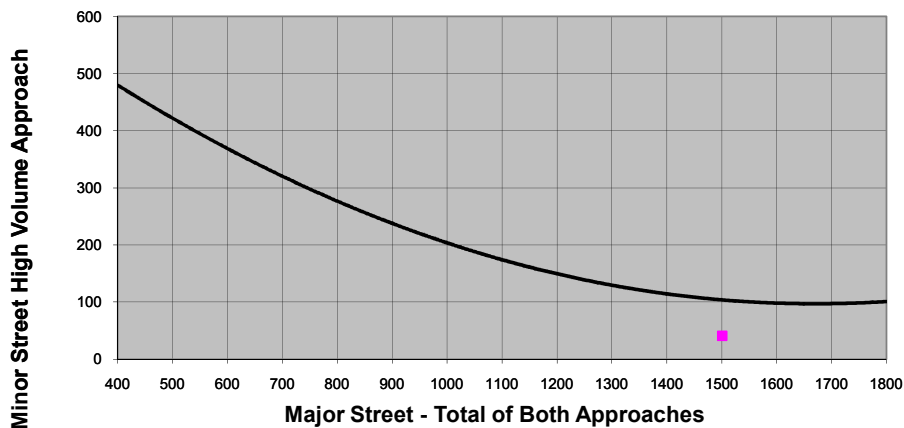
Excessive Total Stopped Delay? (> 4 vehicle-hours ?)
Excessive Stopped Volume? (> 100 vehicles per hour ?)
Excessive Entering Volume? (> 800 vehicles entering ?)

Fails Criteria
Fails Criteria
Meets Criteria

Criteria B:

Volumes fall above the applicable curve in Figure 4C-3 (or Figure 4C-4, if applicable)?
No (Yes or No)

FIGURE 4C-3: Warrant 3, Peak Hour



Fails to Satisfy Warrant 3

APPENDIX B – 2011 AND 2020 INTERSECTION LOS AND QUEUE CALCULATIONS WITHOUT IMPROVEMENTS

HCM Unsignalized Intersection Capacity Analysis

870: Sahalee Way NE & 223rd AVE NE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+Exi Timings AM_Scenario 1

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	309	26	4	900	0	78	1	11	5	0	15
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.88	0.88	0.88	0.94	0.94	0.94	0.73	0.73	0.73	0.83	0.83	0.83
Hourly flow rate (vph)	6	351	30	4	957	0	107	1	15	6	0	18
Pedestrians				1			1			2		
Lane Width (ft)				11.0			11.0			12.0		
Walking Speed (ft/s)				4.0			4.0			4.0		
Percent Blockage				0			0			0		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	959			382			1362	1346	368	1347	1361	959
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	959			382			1362	1346	368	1347	1361	959
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			9	99	98	95	100	94
cM capacity (veh/h)	716			1187			118	151	681	124	147	314
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	6	381	4	957	123	24						
Volume Left	6	0	4	0	107	6						
Volume Right	0	30	0	0	15	18						
cSH	716	1700	1187	1700	131	227						
Volume to Capacity	0.01	0.22	0.00	0.56	0.94	0.11						
Queue Length 95th (ft)	1	0	0	0	158	9						
Control Delay (s)	10.1	0.0	8.0	0.0	127.1	22.7						
Lane LOS	B		A		F	C						
Approach Delay (s)	0.1		0.0		127.1	22.7						
Approach LOS					F	C						
Intersection Summary												
Average Delay			10.9									
Intersection Capacity Utilization			65.8%			ICU Level of Service			C			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+Exi Timings AM_Scenario 1

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	118	285	282	142	129	186	475	81	88	642	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			0%			2%	
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1678	1766	1485	1678	1766	1483	1694	3289		1694	3350	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1678	1766	1485	1678	1766	1483	1694	3289		1694	3350	
Peak-hour factor, PHF	0.70	0.70	0.70	0.71	0.71	0.71	0.79	0.79	0.79	0.79	0.79	0.79
Adj. Flow (vph)	114	169	407	397	200	182	235	601	103	111	813	54
RTOR Reduction (vph)	0	0	41	0	0	101	0	6	0	0	2	0
Lane Group Flow (vph)	114	169	366	397	200	81	235	698	0	111	865	0
Confl. Peds. (#/hr)			5			2			7			1
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	pm+ov		Prot	pm+ov		Prot			Prot		
Protected Phases	3	8	5	7	4	1	5	2		1	6	
Permitted Phases			8			4						
Actuated Green, G (s)	15.8	20.4	47.7	40.9	45.1	60.5	27.3	58.4		15.4	46.5	
Effective Green, g (s)	17.8	22.4	51.7	42.9	47.5	64.5	29.3	60.7		17.4	48.8	
Actuated g/C Ratio	0.11	0.14	0.33	0.28	0.31	0.42	0.19	0.39		0.11	0.31	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.4	5.0	5.0	5.3		5.0	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	192	255	523	463	540	616	319	1285		190	1052	
v/s Ratio Prot	0.07	0.10	c0.13	c0.24	0.11	0.01	c0.14	0.21		0.07	c0.26	
v/s Ratio Perm			0.11			0.04						
v/c Ratio	0.59	0.66	0.70	0.86	0.37	0.13	0.74	0.54		0.58	0.82	
Uniform Delay, d1	65.4	62.9	45.1	53.3	42.2	28.1	59.4	36.6		65.6	49.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.3	4.9	3.5	14.0	0.2	0.0	7.4	0.3		2.9	5.0	
Delay (s)	68.6	67.9	48.6	67.4	42.4	28.2	66.8	36.9		68.5	54.3	
Level of Service	E	E	D	E	D	C	E	D		E	D	
Approach Delay (s)		56.6			51.8			44.4			55.9	
Approach LOS		E			D			D			E	
Intersection Summary												
HCM Average Control Delay			51.9			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			155.4			Sum of lost time (s)				9.0		
Intersection Capacity Utilization			65.8%			ICU Level of Service				C		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+Exi Timings AM_Scenario 1

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	3	22	249	13	182	35	661	75	51	651	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-2%			2%	
Total Lost time (s)		2.0	4.0		3.0	3.0	3.0	3.0		3.5	3.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1767	1541		1735	1546	1711	3361		1661	3303	
Flt Permitted		0.81	1.00		0.72	1.00	0.25	1.00		0.12	1.00	
Satd. Flow (perm)		1485	1541		1314	1546	442	3361		215	3303	
Peak-hour factor, PHF	0.75	0.75	0.75	0.93	0.93	0.93	0.70	0.70	0.70	0.89	0.89	0.89
Adj. Flow (vph)	15	4	29	268	14	196	50	944	107	57	731	25
RTOR Reduction (vph)	0	0	18	0	0	118	0	4	0	0	1	0
Lane Group Flow (vph)	0	19	11	0	282	78	50	1047	0	57	755	0
Confl. Peds. (#/hr)			1	1			2		2	2		2
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	3%	3%	3%	4%	4%	4%
Turn Type	Perm		Perm	Perm		Perm	pm+pt			pm+pt		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		
Actuated Green, G (s)		34.6	34.6		34.6	34.6	40.0	35.0		39.6	34.8	
Effective Green, g (s)		37.6	35.6		36.6	36.6	46.0	38.0		44.6	37.8	
Actuated g/C Ratio		0.41	0.39		0.40	0.40	0.50	0.42		0.49	0.41	
Clearance Time (s)		5.0	5.0		5.0	5.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		611	600		526	619	334	1397		220	1366	
v/s Ratio Prot							0.01	c0.31		c0.02	0.23	
v/s Ratio Perm		0.01	0.01		c0.21	0.05	0.06			0.11		
v/c Ratio		0.03	0.02		0.54	0.13	0.15	0.75		0.26	0.55	
Uniform Delay, d1		16.0	17.2		20.9	17.3	12.5	22.7		15.0	20.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.0		0.5	0.0	0.1	2.0		0.2	0.3	
Delay (s)		16.0	17.2		21.4	17.3	12.6	24.6		15.2	20.6	
Level of Service		B	B		C	B	B	C		B	C	
Approach Delay (s)		16.7			19.8			24.1			20.3	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay			21.8									
HCM Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			91.4									
Intersection Capacity Utilization			56.0%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+Exi Timings AM_Scenario 1



Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Volume (vph)	101	65	8	91	828	0	941	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%				0%		-3%	
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.85		1.00	1.00		0.99	
Flt Protected	0.95	1.00		0.95	1.00		1.00	
Satd. Flow (prot)	1711	1506		1678	3355		3383	
Flt Permitted	0.95	1.00		0.95	1.00		1.00	
Satd. Flow (perm)	1711	1506		1678	3355		3383	
Peak-hour factor, PHF	0.65	0.65	0.69	0.69	0.69	0.82	0.82	0.82
Adj. Flow (vph)	155	100	12	132	1200	0	1148	45
RTOR Reduction (vph)	0	85	0	0	0	0	2	0
Lane Group Flow (vph)	155	15	0	144	1200	0	1191	0
Confl. Peds. (#/hr)	2	2						2
Heavy Vehicles (%)	2%	2%	4%	4%	4%	4%	4%	4%
Turn Type		Perm	Prot	Prot		Prot		
Protected Phases	8		5	5	2	1	6	
Permitted Phases	8	8						
Actuated Green, G (s)	14.4	14.4		14.6	84.0		63.8	
Effective Green, g (s)	17.0	17.0		17.2	87.0		66.8	
Actuated g/C Ratio	0.15	0.15		0.16	0.79		0.61	
Clearance Time (s)	5.6	5.6		5.6	6.0		6.0	
Vehicle Extension (s)	2.0	2.0		3.0	3.0		2.0	
Lane Grp Cap (vph)	264	233		262	2654		2054	
v/s Ratio Prot	c0.09			c0.09	0.36		c0.35	
v/s Ratio Perm		0.01						
v/c Ratio	0.59	0.07		0.55	0.45		0.58	
Uniform Delay, d1	43.2	39.7		42.8	3.7		13.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	2.1	0.0		2.4	0.6		1.2	
Delay (s)	45.4	39.8		45.2	4.3		14.3	
Level of Service	D	D		D	A		B	
Approach Delay (s)	43.2				8.7		14.3	
Approach LOS	D				A		B	

Intersection Summary

HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+Exi Timings AM_Scenario 1

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	3	0	2	146	0	274	3	732	69	4	105	1041
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	3.0	3.0	2.3		3.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00	0.99		1.00	0.99	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85		1.00	1.00
Flt Protected		0.95	1.00		0.95	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1745	1539		1694	1493	1678	3355	1501		1678	3354
Flt Permitted		0.95	1.00		0.95	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1745	1539		1694	1493	1678	3355	1501		1678	3354
Peak-hour factor, PHF	0.42	0.42	0.42	0.84	0.84	0.84	0.76	0.76	0.76	0.80	0.80	0.80
Adj. Flow (vph)	7	0	5	174	0	326	4	963	91	5	131	1301
RTOR Reduction (vph)	0	0	5	0	0	272	0	0	75	0	0	0
Lane Group Flow (vph)	0	7	0	0	174	54	4	963	16	0	136	1305
Confl. Peds. (#/hr)			2			1			3			
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Split		Perm	Split		Perm	Prot		Over	Prot	Prot	
Protected Phases	3	3		4	4		5	2	4	1	1	6
Permitted Phases			3			4						
Actuated Green, G (s)		2.3	2.3		15.8	15.8	1.1	55.4	15.8		13.2	67.5
Effective Green, g (s)		5.3	5.3		18.1	18.1	4.1	58.4	18.8		16.2	69.5
Actuated g/C Ratio		0.05	0.05		0.16	0.16	0.04	0.53	0.17		0.15	0.63
Clearance Time (s)		6.0	6.0		5.3	5.3	6.0	6.0	5.3		6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		84	74		279	246	63	1781	257		247	2119
v/s Ratio Prot		c0.00			c0.10		0.00	0.29	0.01		c0.08	c0.39
v/s Ratio Perm			0.00			0.04						
v/c Ratio		0.08	0.00		0.62	0.22	0.06	0.54	0.06		0.55	0.62
Uniform Delay, d1		50.0	49.8		42.8	39.8	51.1	17.0	38.2		43.5	12.2
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2	0.0		3.1	0.2	0.2	1.2	0.0		1.5	1.4
Delay (s)		50.2	49.8		45.9	40.0	51.3	18.2	38.2		45.0	13.6
Level of Service		D	D		D	D	D	B	D		D	B
Approach Delay (s)		50.0			42.0			20.0				16.5
Approach LOS		D			D			C				B
Intersection Summary												
HCM Average Control Delay			22.1				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)		9.0			
Intersection Capacity Utilization			62.1%				ICU Level of Service		B			
Analysis Period (min)			15									
c Critical Lane Group												

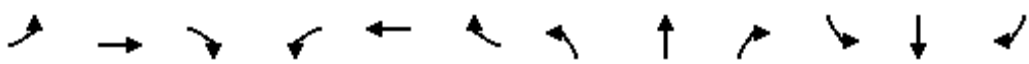
Movement	SBR
Lane Configurations	
Volume (vph)	3
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.80
Adj. Flow (vph)	4
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+Exi Timings AM_Scenario 1

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	81	34	146	83	387	24	271	66	310	686	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-2%			0%			0%	
Total Lost time (s)	5.7	5.7		3.1	5.7	3.1	6.0	3.0	3.0	3.4	3.0	6.0
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.90	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1678	1675		1663	1499	1413	1646	3292	1444	3255	1766	1458
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1678	1675		1663	1499	1413	1646	3292	1444	3255	1766	1458
Peak-hour factor, PHF	0.66	0.66	0.66	0.90	0.90	0.90	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	83	123	52	162	92	430	27	308	75	348	771	31
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	48	0	0	3
Lane Group Flow (vph)	83	166	0	162	268	254	27	308	27	348	771	28
Confl. Peds. (#/hr)			3						7			3
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	6%	6%	6%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	10.4	19.5		15.8	24.9	24.9	4.2	38.7	38.7	16.9	51.4	51.4
Effective Green, g (s)	10.4	19.5		18.4	24.9	27.5	4.2	41.7	41.7	19.5	54.4	51.4
Actuated g/C Ratio	0.09	0.17		0.16	0.22	0.24	0.04	0.36	0.36	0.17	0.48	0.45
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	153	286		268	327	340	60	1201	527	555	841	656
v/s Ratio Prot	0.05	0.10		c0.10	0.18		0.02	0.09		c0.11	c0.44	
v/s Ratio Perm						c0.18			0.02			0.02
v/c Ratio	0.54	0.58		0.60	0.82	0.75	0.45	0.26	0.05	0.63	0.92	0.04
Uniform Delay, d1	49.7	43.6		44.6	42.6	40.2	53.9	25.4	23.5	44.0	27.8	17.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	1.8		2.6	14.0	7.6	1.9	0.0	0.0	1.6	14.3	0.0
Delay (s)	51.8	45.4		47.2	56.6	47.8	55.9	25.5	23.5	45.6	42.1	17.7
Level of Service	D	D		D	E	D	E	C	C	D	D	B
Approach Delay (s)		47.5			51.1			27.1			42.5	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM Average Control Delay			42.9			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			114.3			Sum of lost time (s)				9.5		
Intersection Capacity Utilization			74.6%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

870: Sahalee Way NE & 223rd AVE NE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+Exi Timings PM_Scenario 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	11	743	75	10	457	16	22	2	13	9	2	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.88	0.88	0.88	0.71	0.71	0.71	0.64	0.64	0.64
Hourly flow rate (vph)	12	816	82	11	519	18	31	3	18	14	3	11
Pedestrians					2			2			1	
Lane Width (ft)					11.0			11.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	538			901			1438	1445	862	1415	1477	529
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	538			901			1438	1445	862	1415	1477	529
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			71	98	95	87	97	98
cM capacity (veh/h)	1039			762			105	129	357	106	124	553
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	12	899	11	538	52	28						
Volume Left	12	0	11	0	31	14						
Volume Right	0	82	0	18	18	11						
cSH	1039	1700	762	1700	142	158						
Volume to Capacity	0.01	0.53	0.01	0.32	0.37	0.18						
Queue Length 95th (ft)	1	0	1	0	38	16						
Control Delay (s)	8.5	0.0	9.8	0.0	44.5	32.6						
Lane LOS	A		A		E	D						
Approach Delay (s)	0.1		0.2		44.5	32.6						
Approach LOS					E	D						
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			54.3%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+Exi Timings PM_Scenario 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	82	200	281	162	111	143	220	489	137	163	485	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			0%			2%	
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1745	1837	1550	1728	1818	1546	1728	3325		1710	3372	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1745	1837	1550	1728	1818	1546	1728	3325		1710	3372	
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	92	225	316	180	123	159	239	532	149	179	533	47
RTOR Reduction (vph)	0	0	119	0	0	89	0	14	0	0	4	0
Lane Group Flow (vph)	92	225	197	180	123	70	239	667	0	179	576	0
Confl. Peds. (#/hr)			2									1
Confl. Bikes (#/hr)									3			2
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	pm+ov		Prot	pm+ov		Prot			Prot		
Protected Phases	3	8	5	7	4	1	5	2		1	6	
Permitted Phases			8			4						
Actuated Green, G (s)	11.7	20.5	45.0	18.2	26.6	44.9	24.5	33.7		18.3	27.5	
Effective Green, g (s)	13.7	22.5	49.0	20.2	29.0	48.9	26.5	36.0		20.3	29.8	
Actuated g/C Ratio	0.12	0.20	0.44	0.18	0.26	0.44	0.24	0.32		0.18	0.27	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.4	5.0	5.0	5.3		5.0	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	215	372	726	314	475	681	413	1078		313	905	
v/s Ratio Prot	0.05	c0.12	0.06	c0.10	0.07	0.02	c0.14	c0.20		0.10	0.17	
v/s Ratio Perm			0.06			0.03						
v/c Ratio	0.43	0.60	0.27	0.57	0.26	0.10	0.58	0.62		0.57	0.64	
Uniform Delay, d1	45.0	40.2	19.7	41.5	32.5	18.2	37.3	31.7		41.4	35.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	1.9	0.1	1.6	0.1	0.0	1.2	0.8		1.6	1.1	
Delay (s)	45.5	42.1	19.7	43.0	32.6	18.2	38.5	32.5		43.0	36.9	
Level of Service	D	D	B	D	C	B	D	C		D	D	
Approach Delay (s)		31.4			31.7			34.0			38.3	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM Average Control Delay			34.2			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			111.0			Sum of lost time (s)			9.0			
Intersection Capacity Utilization			60.0%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+Exi Timings PM_Scenario 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	17	16	147	9	97	44	880	258	151	828	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-2%			2%	
Total Lost time (s)		2.0	4.0		3.0	3.0	2.0	3.0		2.5	3.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1774	1534		1712	1531	1743	3343		1710	3397	
Flt Permitted		0.70	1.00		0.64	1.00	0.28	1.00		0.15	1.00	
Satd. Flow (perm)		1286	1534		1149	1531	516	3343		263	3397	
Peak-hour factor, PHF	0.78	0.78	0.78	0.82	0.82	0.82	0.96	0.96	0.96	0.94	0.94	0.94
Adj. Flow (vph)	54	22	21	179	11	118	46	917	269	161	881	34
RTOR Reduction (vph)	0	0	16	0	0	91	0	10	0	0	1	0
Lane Group Flow (vph)	0	76	5	0	190	27	46	1176	0	161	914	0
Confl. Peds. (#/hr)			4	4			5		5	5		5
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm		Perm	Perm		Perm	pm+pt			pm+pt		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		
Actuated Green, G (s)		21.5	21.5		21.5	21.5	59.9	55.2		70.5	60.8	
Effective Green, g (s)		24.5	22.5		23.5	23.5	65.9	58.2		73.0	63.8	
Actuated g/C Ratio		0.24	0.22		0.23	0.23	0.64	0.57		0.71	0.62	
Clearance Time (s)		5.0	5.0		5.0	5.0	5.0	6.0		5.0	6.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		306	335		262	349	422	1889		366	2104	
v/s Ratio Prot							0.01	c0.35		c0.05	0.27	
v/s Ratio Perm		0.06	0.00		c0.17	0.02	0.06			0.26		
v/c Ratio		0.25	0.02		0.73	0.08	0.11	0.62		0.44	0.43	
Uniform Delay, d1		31.8	31.6		36.8	31.2	7.0	15.0		9.0	10.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2	0.0		8.2	0.0	0.0	0.5		0.3	0.1	
Delay (s)		31.9	31.6		44.9	31.3	7.1	15.5		9.3	10.3	
Level of Service		C	C		D	C	A	B		A	B	
Approach Delay (s)		31.9			39.7			15.2			10.1	
Approach LOS		C			D			B			B	
Intersection Summary												
HCM Average Control Delay		16.6										
HCM Volume to Capacity ratio		0.62										
Actuated Cycle Length (s)		103.0										
Intersection Capacity Utilization		66.3%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+Exi Timings PM_Scenario 2



Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Volume (vph)	65	165	11	107	1203	2	1041	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%				0%		-3%	
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	0.85		1.00	1.00	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1745	1534		1728	3455	1736	3438	
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1745	1534		1728	3455	1736	3438	
Peak-hour factor, PHF	0.93	0.93	0.96	0.96	0.96	0.94	0.94	0.94
Adj. Flow (vph)	70	177	11	111	1253	2	1107	78
RTOR Reduction (vph)	0	159	0	0	0	0	3	0
Lane Group Flow (vph)	70	18	0	122	1253	2	1182	0
Confl. Peds. (#/hr)	3	2						
Heavy Vehicles (%)	0%	0%	1%	1%	1%	2%	2%	2%
Turn Type		Perm	Prot	Prot		Prot		
Protected Phases	8		5	5	2	1	6	
Permitted Phases	8	8						
Actuated Green, G (s)	8.8	8.8		13.0	82.6	1.0	71.0	
Effective Green, g (s)	11.4	11.4		15.6	85.6	4.0	74.0	
Actuated g/C Ratio	0.10	0.10		0.14	0.78	0.04	0.67	
Clearance Time (s)	5.6	5.6		5.6	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0		3.0	3.0	2.0	2.0	
Lane Grp Cap (vph)	181	159		245	2689	63	2313	
v/s Ratio Prot	c0.04			c0.07	0.36	0.00	c0.34	
v/s Ratio Perm		0.01						
v/c Ratio	0.39	0.12		0.50	0.47	0.03	0.51	
Uniform Delay, d1	46.0	44.7		43.6	4.2	51.1	9.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.1		1.6	0.6	0.1	0.8	
Delay (s)	46.5	44.8		45.2	4.8	51.2	9.8	
Level of Service	D	D		D	A	D	A	
Approach Delay (s)	45.3				8.4		9.9	
Approach LOS	D				A		A	

Intersection Summary

HCM Average Control Delay	12.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+Exi Timings PM_Scenario 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	11	2	19	122	10	191	9	1179	180	9	282	992
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	3.0	3.0	2.3		3.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00	0.99		1.00	0.98	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85		1.00	1.00
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1762	1539		1738	1516	1728	3455	1546		1728	3446
Flt Permitted		0.96	1.00		0.96	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1762	1539		1738	1516	1728	3455	1546		1728	3446
Peak-hour factor, PHF	0.67	0.67	0.67	0.82	0.82	0.82	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	16	3	28	149	12	233	10	1282	196	10	324	1140
RTOR Reduction (vph)	0	0	26	0	0	197	0	0	145	0	0	0
Lane Group Flow (vph)	0	19	2	0	161	36	10	1282	51	0	334	1155
Confl. Peds. (#/hr)			2			5			5			
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split		Perm	Split		Perm	Prot		Over	Prot	Prot	
Protected Phases	3	3		4	4		5	2	4	1	1	6
Permitted Phases			3			4						
Actuated Green, G (s)		3.9	3.9		14.7	14.7	1.3	32.9	14.7		35.2	66.8
Effective Green, g (s)		6.9	6.9		17.0	17.0	4.3	35.9	17.7		38.2	68.8
Actuated g/C Ratio		0.06	0.06		0.15	0.15	0.04	0.33	0.16		0.35	0.63
Clearance Time (s)		6.0	6.0		5.3	5.3	6.0	6.0	5.3		6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		111	97		269	234	68	1128	249		600	2155
v/s Ratio Prot		c0.01			c0.09		0.01	c0.37	0.03		c0.19	0.34
v/s Ratio Perm			0.00			0.02						
v/c Ratio		0.17	0.02		0.60	0.15	0.15	1.14	0.20		0.56	0.54
Uniform Delay, d1		48.8	48.4		43.3	40.3	51.1	37.0	40.0		29.0	11.6
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3	0.0		2.4	0.1	0.4	72.7	0.1		0.6	1.0
Delay (s)		49.1	48.4		45.7	40.4	51.4	109.7	40.2		29.7	12.6
Level of Service		D	D		D	D	D	F	D		C	B
Approach Delay (s)		48.7			42.6			100.2				16.4
Approach LOS		D			D			F				B
Intersection Summary												
HCM Average Control Delay			56.3				HCM Level of Service			E		
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			80.8%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+Exi Timings PM_Scenario 2

Movement	SBR
Lane Configurations	
Volume (vph)	13
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.87
Adj. Flow (vph)	15
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	9
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+Exi Timings PM_Scenario 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	81	13	100	97	458	25	734	165	441	373	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-2%			0%			0%	
Total Lost time (s)	5.7	5.7		3.1	5.7	3.1	6.0	3.0	3.0	3.4	3.0	6.0
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.90	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1662	1702		1745	1572	1483	1728	3455	1513	3319	1801	1490
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1662	1702		1745	1572	1483	1728	3455	1513	3319	1801	1490
Peak-hour factor, PHF	0.95	0.95	0.95	0.94	0.94	0.94	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	85	85	14	106	103	487	28	816	183	490	414	29
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	100	0	0	5
Lane Group Flow (vph)	85	96	0	106	303	287	28	816	83	490	414	24
Confl. Peds. (#/hr)			12						8			2
Heavy Vehicles (%)	5%	5%	5%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	11.4	28.1		12.8	29.5	29.5	4.3	39.1	39.1	23.2	58.0	58.0
Effective Green, g (s)	11.4	28.1		15.4	29.5	32.1	4.3	42.1	42.1	25.8	61.0	58.0
Actuated g/C Ratio	0.09	0.22		0.12	0.23	0.25	0.03	0.33	0.33	0.20	0.48	0.46
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	150	378		212	366	376	59	1149	503	676	868	683
v/s Ratio Prot	0.05	0.06		c0.06	0.19		0.02	c0.24		c0.15	0.23	
v/s Ratio Perm						c0.19			0.05			0.02
v/c Ratio	0.57	0.25		0.50	0.83	0.76	0.47	0.71	0.16	0.72	0.48	0.03
Uniform Delay, d1	55.2	40.6		52.0	46.1	43.7	60.0	36.9	29.8	47.1	22.1	18.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	0.1		0.7	13.6	8.0	2.2	1.7	0.1	3.3	0.2	0.0
Delay (s)	58.1	40.7		52.7	59.7	51.8	62.2	38.7	29.9	50.4	22.2	18.9
Level of Service	E	D		D	E	D	E	D	C	D	C	B
Approach Delay (s)		48.8			55.4			37.7			36.9	
Approach LOS		D			E			D			D	

Intersection Summary

HCM Average Control Delay	42.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	126.6	Sum of lost time (s)	9.5
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

870: Sahalee Way NE & 223rd AVE NE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+OptimzTimings AM_Scenario 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	309	26	4	900	0	78	1	11	5	0	15
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.88	0.88	0.88	0.94	0.94	0.94	0.73	0.73	0.73	0.83	0.83	0.83
Hourly flow rate (vph)	6	351	30	4	957	0	107	1	15	6	0	18
Pedestrians				1			1			2		
Lane Width (ft)				11.0			11.0			12.0		
Walking Speed (ft/s)				4.0			4.0			4.0		
Percent Blockage				0			0			0		
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	959			382			1362	1346	368	1347	1361	959
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	959			382			1362	1346	368	1347	1361	959
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			9	99	98	95	100	94
cM capacity (veh/h)	716			1187			118	151	681	124	147	314
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	6	381	4	957	123	24						
Volume Left	6	0	4	0	107	6						
Volume Right	0	30	0	0	15	18						
cSH	716	1700	1187	1700	131	227						
Volume to Capacity	0.01	0.22	0.00	0.56	0.94	0.11						
Queue Length 95th (ft)	1	0	0	0	158	9						
Control Delay (s)	10.1	0.0	8.0	0.0	127.1	22.7						
Lane LOS	B		A		F	C						
Approach Delay (s)	0.1		0.0		127.1	22.7						
Approach LOS					F	C						
Intersection Summary												
Average Delay			10.9									
Intersection Capacity Utilization			65.8%			ICU Level of Service			C			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+OptimzTimings AM_Scenario 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	118	285	282	142	129	186	475	81	88	642	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			0%			2%	
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1678	1766	1485	1678	1766	1485	1694	3296		1694	3351	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1678	1766	1485	1678	1766	1485	1694	3296		1694	3351	
Peak-hour factor, PHF	0.70	0.70	0.70	0.71	0.71	0.71	0.79	0.79	0.79	0.79	0.79	0.79
Adj. Flow (vph)	114	169	407	397	200	182	235	601	103	111	813	54
RTOR Reduction (vph)	0	0	42	0	0	107	0	15	0	0	5	0
Lane Group Flow (vph)	114	169	365	397	200	75	235	689	0	111	862	0
Confl. Peds. (#/hr)			5			2			7			1
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot			Prot		
Protected Phases	3	8	5	7	4	1	5	2		1	6	
Permitted Phases			8			4						
Actuated Green, G (s)	7.9	13.3	24.3	20.0	25.0	31.8	11.0	26.0		6.8	21.8	
Effective Green, g (s)	9.9	15.3	28.3	22.0	27.4	35.8	13.0	28.3		8.8	24.1	
Actuated g/C Ratio	0.11	0.18	0.33	0.25	0.32	0.41	0.15	0.33		0.10	0.28	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.4	5.0	5.0	5.3		5.0	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	192	313	538	427	560	615	255	1080		173	935	
v/s Ratio Prot	0.07	0.10	c0.10	c0.24	0.11	0.01	c0.14	0.21		0.07	c0.26	
v/s Ratio Perm			0.14			0.04						
v/c Ratio	0.59	0.54	0.68	0.93	0.36	0.12	0.92	0.64		0.64	0.92	
Uniform Delay, d1	36.3	32.3	25.1	31.4	22.7	15.6	36.2	24.7		37.3	30.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.3	0.9	2.7	26.1	0.1	0.0	35.4	0.9		6.0	13.9	
Delay (s)	39.6	33.2	27.8	57.6	22.9	15.6	71.6	25.6		43.2	44.2	
Level of Service	D	C	C	E	C	B	E	C		D	D	
Approach Delay (s)		31.1			38.9			37.1			44.1	
Approach LOS		C			D			D			D	
Intersection Summary												
HCM Average Control Delay	38.3			HCM Level of Service			D					
HCM Volume to Capacity ratio	0.88											
Actuated Cycle Length (s)	86.4			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	65.8%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+OptimzTimings AM_Scenario 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	3	22	249	13	182	35	661	75	51	651	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-2%			2%	
Total Lost time (s)		2.0	4.0		3.0	3.0	1.0	3.0		1.5	3.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1767	1541		1735	1546	1711	3361		1661	3303	
Flt Permitted		0.80	1.00		0.72	1.00	0.28	1.00		0.16	1.00	
Satd. Flow (perm)		1471	1541		1313	1546	509	3361		275	3303	
Peak-hour factor, PHF	0.75	0.75	0.75	0.93	0.93	0.93	0.70	0.70	0.70	0.89	0.89	0.89
Adj. Flow (vph)	15	4	29	268	14	196	50	944	107	57	731	25
RTOR Reduction (vph)	0	0	20	0	0	130	0	8	0	0	2	0
Lane Group Flow (vph)	0	19	9	0	282	66	50	1043	0	57	754	0
Confl. Peds. (#/hr)			1	1			2		2	2		2
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	3%	3%	3%	4%	4%	4%
Turn Type	Perm		Perm	Perm		Perm	pm+pt			pm+pt		
Protected Phases		8			4		5	2			1	6
Permitted Phases	8		8	4		4	2			6		
Actuated Green, G (s)		17.8	17.8		17.8	17.8	26.4	24.1		26.4	24.1	
Effective Green, g (s)		20.8	18.8		19.8	19.8	32.4	27.1		31.4	27.1	
Actuated g/C Ratio		0.35	0.32		0.33	0.33	0.55	0.46		0.53	0.46	
Clearance Time (s)		5.0	5.0		5.0	5.0	4.0	6.0		4.0	6.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)		517	489		439	517	386	1539		258	1512	
v/s Ratio Prot							0.01	c0.31		c0.02	0.23	
v/s Ratio Perm		0.01	0.01		c0.21	0.04	0.06			0.10		
v/c Ratio		0.04	0.02		0.64	0.13	0.13	0.68		0.22	0.50	
Uniform Delay, d1		12.6	13.9		16.7	13.7	6.6	12.6		8.0	11.3	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.0		2.4	0.0	0.2	0.9		0.4	0.1	
Delay (s)		12.6	13.9		19.1	13.7	6.7	13.6		8.4	11.4	
Level of Service		B	B		B	B	A	B		A	B	
Approach Delay (s)		13.4			16.9			13.3			11.2	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			13.3									HCM Level of Service B
HCM Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			59.2									Sum of lost time (s) 7.5
Intersection Capacity Utilization			55.2%									ICU Level of Service B
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+OptimzTimings AM_Scenario 2



Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Volume (vph)	101	65	8	91	828	0	941	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%				0%		-3%	
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.85		1.00	1.00		0.99	
Flt Protected	0.95	1.00		0.95	1.00		1.00	
Satd. Flow (prot)	1711	1506		1678	3355		3383	
Flt Permitted	0.95	1.00		0.95	1.00		1.00	
Satd. Flow (perm)	1711	1506		1678	3355		3383	
Peak-hour factor, PHF	0.65	0.65	0.69	0.69	0.69	0.82	0.82	0.82
Adj. Flow (vph)	155	100	12	132	1200	0	1148	45
RTOR Reduction (vph)	0	85	0	0	0	0	2	0
Lane Group Flow (vph)	155	15	0	144	1200	0	1191	0
Confl. Peds. (#/hr)	2	2						2
Heavy Vehicles (%)	2%	2%	4%	4%	4%	4%	4%	4%
Turn Type		Perm	Prot	Prot		Prot		
Protected Phases	8		5	5	2	1	6	
Permitted Phases	8	8						
Actuated Green, G (s)	14.3	14.3		14.6	84.1		63.9	
Effective Green, g (s)	16.9	16.9		17.2	87.1		66.9	
Actuated g/C Ratio	0.15	0.15		0.16	0.79		0.61	
Clearance Time (s)	5.6	5.6		5.6	6.0		6.0	
Vehicle Extension (s)	2.0	2.0		3.0	3.0		2.0	
Lane Grp Cap (vph)	263	231		262	2657		2057	
v/s Ratio Prot	c0.09			c0.09	0.36		c0.35	
v/s Ratio Perm		0.01						
v/c Ratio	0.59	0.07		0.55	0.45		0.58	
Uniform Delay, d1	43.3	39.8		42.8	3.7		13.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	2.2	0.0		2.4	0.6		1.2	
Delay (s)	45.5	39.8		45.2	4.3		14.2	
Level of Service	D	D		D	A		B	
Approach Delay (s)	43.3				8.7		14.2	
Approach LOS	D				A		B	

Intersection Summary

HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+OptimzTimings AM_Scenario 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	3	0	2	146	0	274	3	732	69	4	105	1041
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	3.0	3.0	2.3		3.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00	0.99		1.00	0.99	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85		1.00	1.00
Flt Protected		0.95	1.00		0.95	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1745	1539		1694	1493	1678	3355	1501		1678	3354
Flt Permitted		0.95	1.00		0.95	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1745	1539		1694	1493	1678	3355	1501		1678	3354
Peak-hour factor, PHF	0.42	0.42	0.42	0.84	0.84	0.84	0.76	0.76	0.76	0.80	0.80	0.80
Adj. Flow (vph)	7	0	5	174	0	326	4	963	91	5	131	1301
RTOR Reduction (vph)	0	0	5	0	0	272	0	0	75	0	0	0
Lane Group Flow (vph)	0	7	0	0	174	54	4	963	16	0	136	1305
Confl. Peds. (#/hr)			2			1			3			
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Split		Perm	Split		Perm	Prot		Over	Prot	Prot	
Protected Phases	3	3		4	4		5	2	4	1	1	6
Permitted Phases			3			4						
Actuated Green, G (s)		2.3	2.3		15.8	15.8	1.1	52.9	15.8		15.7	67.5
Effective Green, g (s)		5.3	5.3		18.1	18.1	4.1	55.9	18.8		18.7	69.5
Actuated g/C Ratio		0.05	0.05		0.16	0.16	0.04	0.51	0.17		0.17	0.63
Clearance Time (s)		6.0	6.0		5.3	5.3	6.0	6.0	5.3		6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		84	74		279	246	63	1705	257		285	2119
v/s Ratio Prot		c0.00			c0.10		0.00	0.29	0.01		c0.08	c0.39
v/s Ratio Perm			0.00			0.04						
v/c Ratio		0.08	0.00		0.62	0.22	0.06	0.56	0.06		0.48	0.62
Uniform Delay, d1		50.0	49.8		42.8	39.8	51.1	18.7	38.2		41.2	12.2
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2	0.0		3.1	0.2	0.2	1.4	0.0		0.5	1.4
Delay (s)		50.2	49.8		45.9	40.0	51.3	20.0	38.2		41.7	13.6
Level of Service		D	D		D	D	D	C	D		D	B
Approach Delay (s)		50.0			42.0			21.7				16.2
Approach LOS		D			D			C				B
Intersection Summary												
HCM Average Control Delay			22.6				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)		13.0			
Intersection Capacity Utilization			62.1%				ICU Level of Service		B			
Analysis Period (min)			15									

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	3
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.80
Adj. Flow (vph)	4
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+OptimzTimings AM_Scenario 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	81	34	146	83	387	24	271	66	310	686	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-2%			0%			0%	
Total Lost time (s)	5.7	5.7		3.1	5.7	3.1	6.0	3.0	3.0	3.4	3.0	6.0
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.90	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1678	1675		1663	1499	1413	1646	3292	1444	3255	1766	1458
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1678	1675		1663	1499	1413	1646	3292	1444	3255	1766	1458
Peak-hour factor, PHF	0.66	0.66	0.66	0.90	0.90	0.90	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	83	123	52	162	92	430	27	308	75	348	771	31
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	46	0	0	4
Lane Group Flow (vph)	83	163	0	162	268	254	27	308	29	348	771	27
Confl. Peds. (#/hr)			3						7			3
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	6%	6%	6%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	8.3	19.9		15.4	27.0	27.0	2.7	42.0	42.0	15.6	54.9	54.9
Effective Green, g (s)	8.3	19.9		18.0	27.0	29.6	2.7	45.0	45.0	18.2	57.9	54.9
Actuated g/C Ratio	0.07	0.17		0.15	0.23	0.25	0.02	0.39	0.39	0.16	0.50	0.47
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	120	287		257	348	360	38	1274	559	509	879	688
v/s Ratio Prot	0.05	0.10		c0.10	0.18		0.02	0.09		c0.11	c0.44	
v/s Ratio Perm						c0.18			0.02			0.02
v/c Ratio	0.69	0.57		0.63	0.77	0.71	0.71	0.24	0.05	0.68	0.88	0.04
Uniform Delay, d1	52.8	44.3		46.0	41.7	39.4	56.4	24.1	22.3	46.3	26.0	16.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.0	1.5		3.7	9.2	5.1	40.7	0.0	0.0	3.0	9.5	0.0
Delay (s)	65.7	45.8		49.7	51.0	44.5	97.2	24.1	22.3	49.4	35.6	16.5
Level of Service	E	D		D	D	D	F	C	C	D	D	B
Approach Delay (s)		52.2			48.3			28.6			39.2	
Approach LOS		D			D			C			D	

Intersection Summary

HCM Average Control Delay	41.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	116.3	Sum of lost time (s)	9.5
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

870: Sahalee Way NE & 223rd AVE NE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+OptimizTimings PM_Scenario 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	11	743	75	10	457	16	22	2	13	9	2	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.88	0.88	0.88	0.71	0.71	0.71	0.64	0.64	0.64
Hourly flow rate (vph)	12	816	82	11	519	18	31	3	18	14	3	11
Pedestrians					2			2			1	
Lane Width (ft)					11.0			11.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	538			901			1438	1445	862	1415	1477	529
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	538			901			1438	1445	862	1415	1477	529
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			71	98	95	87	97	98
cM capacity (veh/h)	1039			762			105	129	357	106	124	553
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	12	899	11	538	52	28						
Volume Left	12	0	11	0	31	14						
Volume Right	0	82	0	18	18	11						
cSH	1039	1700	762	1700	142	158						
Volume to Capacity	0.01	0.53	0.01	0.32	0.37	0.18						
Queue Length 95th (ft)	1	0	1	0	38	16						
Control Delay (s)	8.5	0.0	9.8	0.0	44.5	32.6						
Lane LOS	A		A		E	D						
Approach Delay (s)	0.1		0.2		44.5	32.6						
Approach LOS					E	D						
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			54.3%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+OptimizTimings PM_Scenario 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	82	200	281	162	111	143	220	489	137	163	485	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			0%			2%	
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1745	1837	1547	1728	1818	1546	1728	3324		1710	3372	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1745	1837	1547	1728	1818	1546	1728	3324		1710	3372	
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	92	225	316	180	123	159	239	532	149	179	533	47
RTOR Reduction (vph)	0	0	75	0	0	84	0	37	0	0	9	0
Lane Group Flow (vph)	92	225	241	180	123	75	239	644	0	179	571	0
Confl. Peds. (#/hr)			2									1
Confl. Bikes (#/hr)									3			2
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	pm+ov		Prot	pm+ov		Prot			Prot		
Protected Phases	3	8	5	7	4	1	5	2		1	6	
Permitted Phases			8			4						
Actuated Green, G (s)	3.8	11.9	18.0	7.8	15.5	21.6	6.1	14.9		6.1	14.9	
Effective Green, g (s)	5.8	13.9	22.0	9.8	17.9	25.6	8.1	17.2		8.1	17.2	
Actuated g/C Ratio	0.10	0.23	0.36	0.16	0.29	0.42	0.13	0.28		0.13	0.28	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.4	5.0	5.0	5.3		5.0	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	166	419	634	278	533	649	229	937		227	951	
v/s Ratio Prot	0.05	c0.12	0.05	c0.10	0.07	0.02	c0.14	c0.19		0.10	0.17	
v/s Ratio Perm			0.11			0.03						
v/c Ratio	0.55	0.54	0.38	0.65	0.23	0.12	1.04	0.69		0.79	0.60	
Uniform Delay, d1	26.4	20.7	14.4	24.0	16.3	10.8	26.4	19.5		25.6	18.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.7	0.1	3.9	0.1	0.0	71.4	1.7		15.3	0.7	
Delay (s)	28.6	21.4	14.6	27.8	16.4	10.8	97.8	21.2		40.9	19.7	
Level of Service	C	C	B	C	B	B	F	C		D	B	
Approach Delay (s)		19.0			18.9			41.1			24.7	
Approach LOS		B			B			D			C	
Intersection Summary												
HCM Average Control Delay			27.9				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			61.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			60.0%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+OptimizTimings PM_Scenario 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	17	16	147	9	97	44	880	258	151	828	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-2%			2%	
Total Lost time (s)		2.0	4.0		3.0	3.0	2.0	3.0		2.5	3.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1774	1534		1712	1531	1744	3348		1710	3398	
Flt Permitted		0.75	1.00		0.68	1.00	0.26	1.00		0.12	1.00	
Satd. Flow (perm)		1374	1534		1216	1531	484	3348		221	3398	
Peak-hour factor, PHF	0.78	0.78	0.78	0.82	0.82	0.82	0.96	0.96	0.96	0.94	0.94	0.94
Adj. Flow (vph)	54	22	21	179	11	118	46	917	269	161	881	34
RTOR Reduction (vph)	0	0	16	0	0	90	0	22	0	0	2	0
Lane Group Flow (vph)	0	76	5	0	190	28	46	1164	0	161	913	0
Confl. Peds. (#/hr)			4	4			5		5	5		5
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm		Perm	Perm		Perm	pm+pt			pm+pt		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		
Actuated Green, G (s)		13.0	13.0		13.0	13.0	32.2	29.0		37.6	31.7	
Effective Green, g (s)		16.0	14.0		15.0	15.0	38.2	32.0		42.4	34.7	
Actuated g/C Ratio		0.25	0.22		0.23	0.23	0.60	0.50		0.66	0.54	
Clearance Time (s)		5.0	5.0		5.0	5.0	5.0	6.0		5.0	6.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		344	336		285	359	412	1677		342	1845	
v/s Ratio Prot							0.01	c0.35		c0.06	0.27	
v/s Ratio Perm		0.06	0.00		c0.16	0.02	0.06			0.25		
v/c Ratio		0.22	0.01		0.67	0.08	0.11	0.69		0.47	0.49	
Uniform Delay, d1		19.0	19.5		22.2	19.1	5.5	12.2		7.4	9.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1	0.0		4.5	0.0	0.0	1.0		0.4	0.1	
Delay (s)		19.1	19.5		26.7	19.1	5.6	13.2		7.8	9.2	
Level of Service		B	B		C	B	A	B		A	A	
Approach Delay (s)		19.2			23.8			12.9			9.0	
Approach LOS		B			C			B			A	
Intersection Summary												
HCM Average Control Delay		12.8										
HCM Volume to Capacity ratio		0.65										
Actuated Cycle Length (s)		63.9										
Intersection Capacity Utilization		66.3%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+OptimizTimings PM_Scenario 2



Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Volume (vph)	65	165	11	107	1203	2	1041	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%				0%		-3%	
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	0.85		1.00	1.00	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1745	1534		1728	3455	1736	3438	
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1745	1534		1728	3455	1736	3438	
Peak-hour factor, PHF	0.93	0.93	0.96	0.96	0.96	0.94	0.94	0.94
Adj. Flow (vph)	70	177	11	111	1253	2	1107	78
RTOR Reduction (vph)	0	159	0	0	0	0	3	0
Lane Group Flow (vph)	70	18	0	122	1253	2	1182	0
Confl. Peds. (#/hr)	3	2						
Heavy Vehicles (%)	0%	0%	1%	1%	1%	2%	2%	2%
Turn Type		Perm	Prot	Prot		Prot		
Protected Phases	8		5	5	2	1	6	
Permitted Phases	8	8						
Actuated Green, G (s)	8.8	8.8		13.0	82.6	1.0	71.0	
Effective Green, g (s)	11.4	11.4		15.6	85.6	4.0	74.0	
Actuated g/C Ratio	0.10	0.10		0.14	0.78	0.04	0.67	
Clearance Time (s)	5.6	5.6		5.6	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0		3.0	3.0	2.0	2.0	
Lane Grp Cap (vph)	181	159		245	2689	63	2313	
v/s Ratio Prot	c0.04			c0.07	0.36	0.00	c0.34	
v/s Ratio Perm		0.01						
v/c Ratio	0.39	0.12		0.50	0.47	0.03	0.51	
Uniform Delay, d1	46.0	44.7		43.6	4.2	51.1	9.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.1		1.6	0.6	0.1	0.8	
Delay (s)	46.5	44.8		45.2	4.8	51.2	9.8	
Level of Service	D	D		D	A	D	A	
Approach Delay (s)	45.3				8.4		9.9	
Approach LOS	D				A		A	

Intersection Summary

HCM Average Control Delay	12.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+OptimizTimings PM_Scenario 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	11	2	19	122	10	191	9	1179	180	9	282	992
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	3.0	3.0	2.3		3.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00	0.99		1.00	0.98	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85		1.00	1.00
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1762	1539		1738	1516	1728	3455	1546		1728	3446
Flt Permitted		0.96	1.00		0.96	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1762	1539		1738	1516	1728	3455	1546		1728	3446
Peak-hour factor, PHF	0.67	0.67	0.67	0.82	0.82	0.82	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	16	3	28	149	12	233	10	1282	196	10	324	1140
RTOR Reduction (vph)	0	0	26	0	0	197	0	0	145	0	0	0
Lane Group Flow (vph)	0	19	2	0	161	36	10	1282	51	0	334	1155
Confl. Peds. (#/hr)			2			5			5			
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split		Perm	Split		Perm	Prot		Over	Prot	Prot	
Protected Phases	3	3		4	4		5	2	4	1	1	6
Permitted Phases			3			4						
Actuated Green, G (s)		3.9	3.9		14.7	14.7	1.3	32.9	14.7		35.2	66.8
Effective Green, g (s)		6.9	6.9		17.0	17.0	4.3	35.9	17.7		38.2	68.8
Actuated g/C Ratio		0.06	0.06		0.15	0.15	0.04	0.33	0.16		0.35	0.63
Clearance Time (s)		6.0	6.0		5.3	5.3	6.0	6.0	5.3		6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		111	97		269	234	68	1128	249		600	2155
v/s Ratio Prot		c0.01			c0.09		0.01	c0.37	0.03		c0.19	0.34
v/s Ratio Perm			0.00			0.02						
v/c Ratio		0.17	0.02		0.60	0.15	0.15	1.14	0.20		0.56	0.54
Uniform Delay, d1		48.8	48.4		43.3	40.3	51.1	37.0	40.0		29.0	11.6
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3	0.0		2.4	0.1	0.4	72.7	0.1		0.6	1.0
Delay (s)		49.1	48.4		45.7	40.4	51.4	109.7	40.2		29.7	12.6
Level of Service		D	D		D	D	D	F	D		C	B
Approach Delay (s)		48.7			42.6			100.2				16.4
Approach LOS		D			D			F				B
Intersection Summary												
HCM Average Control Delay			56.3				HCM Level of Service			E		
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			80.8%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Movement	SBR
Lane Configurations	
Volume (vph)	13
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.87
Adj. Flow (vph)	15
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	9
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+OptimizTimings PM_Scenario 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	81	13	100	97	458	25	734	165	441	373	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-2%			0%			0%	
Total Lost time (s)	5.7	5.7		3.1	5.7	3.1	6.0	3.0	3.0	3.4	3.0	6.0
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.90	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1662	1701		1745	1572	1483	1728	3455	1512	3319	1801	1490
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1662	1701		1745	1572	1483	1728	3455	1512	3319	1801	1490
Peak-hour factor, PHF	0.95	0.95	0.95	0.94	0.94	0.94	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	85	85	14	106	103	487	28	816	183	490	414	29
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	97	0	0	7
Lane Group Flow (vph)	85	95	0	106	303	287	28	816	86	490	414	22
Confl. Peds. (#/hr)			12						8			2
Heavy Vehicles (%)	5%	5%	5%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	11.4	29.7		13.0	31.3	31.3	3.6	40.0	40.0	24.1	60.5	60.5
Effective Green, g (s)	11.4	29.7		15.6	31.3	33.9	3.6	43.0	43.0	26.7	63.5	60.5
Actuated g/C Ratio	0.09	0.23		0.12	0.24	0.26	0.03	0.33	0.33	0.21	0.49	0.46
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	146	388		209	378	386	48	1141	499	681	878	692
v/s Ratio Prot	0.05	0.06		c0.06	0.19		0.02	c0.24		c0.15	0.23	
v/s Ratio Perm						c0.19			0.06			0.01
v/c Ratio	0.58	0.25		0.51	0.80	0.74	0.58	0.72	0.17	0.72	0.47	0.03
Uniform Delay, d1	57.1	41.1		53.7	46.5	44.2	62.6	38.2	31.0	48.3	22.2	18.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.8	0.1		0.7	11.0	6.6	11.1	1.8	0.1	3.0	0.1	0.0
Delay (s)	60.9	41.2		54.4	57.5	50.8	73.7	40.0	31.0	51.3	22.3	18.9
Level of Service	E	D		D	E	D	E	D	C	D	C	B
Approach Delay (s)		50.3			54.3			39.3			37.4	
Approach LOS		D			D			D			D	

Intersection Summary

HCM Average Control Delay	43.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	130.2	Sum of lost time (s)	9.5
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

870: Sahalee Way NE & 223rd AVE NE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings AM_Scenario 3

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	369	33	1	941	0	85	1	13	6	0	17
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.88	0.88	0.88	0.94	0.94	0.94	0.73	0.73	0.73	0.83	0.83	0.83
Hourly flow rate (vph)	6	419	38	1	1001	0	116	1	18	7	0	20
Pedestrians				1			1			2		
Lane Width (ft)				11.0			11.0			12.0		
Walking Speed (ft/s)				4.0			4.0			4.0		
Percent Blockage				0			0			0		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1003			458			1474	1456	440	1455	1474	1003
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1003			458			1474	1456	440	1455	1474	1003
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			0	99	97	93	100	93
cM capacity (veh/h)	689			1113			97	130	620	104	126	296
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	6	457	1	1001	136	28						
Volume Left	6	0	1	0	116	7						
Volume Right	0	38	0	0	18	20						
cSH	689	1700	1113	1700	110	200						
Volume to Capacity	0.01	0.27	0.00	0.59	1.23	0.14						
Queue Length 95th (ft)	1	0	0	0	223	12						
Control Delay (s)	10.3	0.0	8.2	0.0	235.0	25.9						
Lane LOS	B		A		F	D						
Approach Delay (s)	0.1		0.0		235.0	25.9						
Approach LOS					F	D						
Intersection Summary												
Average Delay			20.1									
Intersection Capacity Utilization			68.5%		ICU Level of Service				C			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings AM_Scenario 3

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	104	123	187	557	134	110	134	632	221	124	699	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			0%			2%	
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1678	1766	1481	1678	1766	1484	1694	3211		1694	3348	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1678	1766	1481	1678	1766	1484	1694	3211		1694	3348	
Peak-hour factor, PHF	0.70	0.70	0.70	0.71	0.71	0.71	0.79	0.79	0.79	0.79	0.79	0.79
Adj. Flow (vph)	149	176	267	785	189	155	170	800	280	157	885	62
RTOR Reduction (vph)	0	0	23	0	0	58	0	15	0	0	3	0
Lane Group Flow (vph)	149	176	244	785	189	97	170	1065	0	157	944	0
Confl. Peds. (#/hr)			5			2			7			1
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot			Prot		
Protected Phases	3	8		7	4	1	5	2		1	6	
Permitted Phases			8			4						
Actuated Green, G (s)	19.7	22.4	44.7	41.0	43.3	64.3	22.3	61.1		21.0	59.8	
Effective Green, g (s)	21.7	24.4	48.7	43.0	45.7	68.3	24.3	63.4		23.0	62.1	
Actuated g/C Ratio	0.13	0.15	0.29	0.26	0.28	0.41	0.15	0.38		0.14	0.37	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.4	5.0	5.0	5.3		5.0	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	220	260	462	435	487	611	248	1228		235	1254	
v/s Ratio Prot	0.09	c0.10	0.08	c0.47	0.11	0.02	c0.10	c0.33		0.09	0.28	
v/s Ratio Perm			0.09			0.04						
v/c Ratio	0.68	0.68	0.53	1.80	0.39	0.16	0.69	0.87		0.67	0.75	
Uniform Delay, d1	68.7	67.0	49.0	61.4	48.7	30.7	67.1	47.3		67.8	45.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.4	5.4	0.5	371.1	0.2	0.0	6.1	6.4		5.5	2.3	
Delay (s)	75.1	72.4	49.5	432.5	48.9	30.7	73.3	53.7		73.2	47.5	
Level of Service	E	E	D	F	D	C	E	D		E	D	
Approach Delay (s)		62.7			313.1			56.4			51.2	
Approach LOS		E			F			E			D	
Intersection Summary												
HCM Average Control Delay			127.0				HCM Level of Service			F		
HCM Volume to Capacity ratio			1.05									
Actuated Cycle Length (s)			165.8				Sum of lost time (s)			9.0		
Intersection Capacity Utilization			83.4%				ICU Level of Service			E		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings AM_Scenario 3

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	3	186	254	16	188	57	616	76	17	589	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-2%			2%	
Total Lost time (s)		2.0	4.0		3.0	3.0	3.0	3.0		3.5	3.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1758	1541		1736	1546	1711	3356		1661	3256	
Flt Permitted		0.73	1.00		0.71	1.00	0.20	1.00		0.16	1.00	
Satd. Flow (perm)		1335	1541		1290	1546	360	3356		288	3256	
Peak-hour factor, PHF	0.75	0.75	0.75	0.93	0.93	0.93	0.70	0.70	0.70	0.89	0.89	0.89
Adj. Flow (vph)	35	4	248	273	17	202	81	880	109	19	662	85
RTOR Reduction (vph)	0	0	145	0	0	113	0	5	0	0	6	0
Lane Group Flow (vph)	0	39	103	0	290	89	81	984	0	19	741	0
Confl. Peds. (#/hr)			1	1			2		2	2		2
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	3%	3%	3%	4%	4%	4%
Turn Type	Perm		Perm	Perm		Perm	pm+pt			pm+pt		
Protected Phases		8			4		5	2			1	6
Permitted Phases	8		8	4		4	2			6		
Actuated Green, G (s)		34.6	34.6		34.6	34.6	38.6	32.2		29.6	27.7	
Effective Green, g (s)		37.6	35.6		36.6	36.6	43.1	35.2		34.6	30.7	
Actuated g/C Ratio		0.44	0.42		0.43	0.43	0.50	0.41		0.40	0.36	
Clearance Time (s)		5.0	5.0		5.0	5.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		586	640		551	660	329	1378		187	1166	
v/s Ratio Prot							c0.03	c0.29		0.01	0.23	
v/s Ratio Perm		0.03	0.07		c0.22	0.06	0.10			0.04		
v/c Ratio		0.07	0.16		0.53	0.13	0.25	0.71		0.10	0.64	
Uniform Delay, d1		13.9	15.7		18.1	14.9	12.7	21.1		16.4	22.8	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.0		0.4	0.0	0.1	1.5		0.1	0.8	
Delay (s)		13.9	15.7		18.6	15.0	12.8	22.5		16.5	23.7	
Level of Service		B	B		B	B	B	C		B	C	
Approach Delay (s)		15.5			17.1			21.8			23.5	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay			20.7				HCM Level of Service				C	
HCM Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			85.7				Sum of lost time (s)			9.0		
Intersection Capacity Utilization			62.8%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings AM_Scenario 3



Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Volume (vph)	67	94	1	156	789	0	764	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%				0%		-3%	
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.85		1.00	1.00		0.99	
Flt Protected	0.95	1.00		0.95	1.00		1.00	
Satd. Flow (prot)	1711	1505		1678	3355		3376	
Flt Permitted	0.95	1.00		0.95	1.00		1.00	
Satd. Flow (perm)	1711	1505		1678	3355		3376	
Peak-hour factor, PHF	0.65	0.65	0.69	0.69	0.69	0.82	0.82	0.82
Adj. Flow (vph)	103	145	1	226	1143	0	932	48
RTOR Reduction (vph)	0	127	0	0	0	0	2	0
Lane Group Flow (vph)	103	18	0	227	1143	0	978	0
Confl. Peds. (#/hr)	2	2						2
Heavy Vehicles (%)	2%	2%	4%	4%	4%	4%	4%	4%
Turn Type	Perm		Prot	Prot		Prot		
Protected Phases	8		5	5	2	1	6	
Permitted Phases	8	8						
Actuated Green, G (s)	11.0	11.0		20.2	87.4		61.6	
Effective Green, g (s)	13.6	13.6		22.8	90.4		64.6	
Actuated g/C Ratio	0.12	0.12		0.21	0.82		0.59	
Clearance Time (s)	5.6	5.6		5.6	6.0		6.0	
Vehicle Extension (s)	2.0	2.0		3.0	3.0		2.0	
Lane Grp Cap (vph)	212	186		348	2757		1983	
v/s Ratio Prot	c0.06			c0.14	0.34		c0.29	
v/s Ratio Perm		0.01						
v/c Ratio	0.49	0.10		0.65	0.41		0.49	
Uniform Delay, d1	44.9	42.8		40.0	2.6		13.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.6	0.1		4.3	0.5		0.9	
Delay (s)	45.6	42.8		44.3	3.1		14.1	
Level of Service	D	D		D	A		B	
Approach Delay (s)	44.0				9.9		14.1	
Approach LOS	D				A		B	

Intersection Summary

HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings AM_Scenario 3

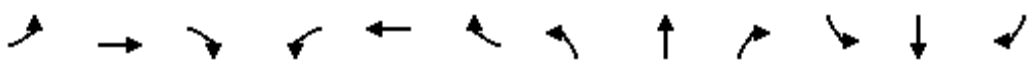
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	0	1	128	0	294	2	711	82	114	868	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	3.0	3.0	2.3	3.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1745	1539		1694	1493	1678	3355	1501	1678	3355	
Flt Permitted		0.95	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1745	1539		1694	1493	1678	3355	1501	1678	3355	
Peak-hour factor, PHF	0.42	0.42	0.42	0.84	0.84	0.84	0.76	0.76	0.76	0.80	0.80	0.80
Adj. Flow (vph)	5	0	2	152	0	350	3	936	108	142	1085	1
RTOR Reduction (vph)	0	0	2	0	0	297	0	0	91	0	0	0
Lane Group Flow (vph)	0	5	0	0	152	53	3	936	17	142	1086	0
Confl. Peds. (#/hr)			2			1			3			2
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Split		Perm	Split		Perm	Prot		Over		Prot	
Protected Phases	3	3		4	4		5	2	4	1	6	
Permitted Phases			3			4						
Actuated Green, G (s)		1.2	1.2		14.5	14.5	1.1	57.4	14.5	13.6	69.9	
Effective Green, g (s)		4.2	4.2		16.8	16.8	4.1	60.4	17.5	16.6	71.9	
Actuated g/C Ratio		0.04	0.04		0.15	0.15	0.04	0.55	0.16	0.15	0.65	
Clearance Time (s)		6.0	6.0		5.3	5.3	6.0	6.0	5.3	6.0	6.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		67	59		259	228	63	1842	239	253	2193	
v/s Ratio Prot		c0.00			c0.09		0.00	c0.28	0.01	c0.08	0.32	
v/s Ratio Perm			0.00			0.04						
v/c Ratio		0.07	0.00		0.59	0.23	0.05	0.51	0.07	0.56	0.50	
Uniform Delay, d1		51.0	50.9		43.4	40.9	51.1	15.5	39.3	43.3	9.8	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2	0.0		2.2	0.2	0.1	1.0	0.0	1.7	0.8	
Delay (s)		51.2	50.9		45.6	41.1	51.2	16.5	39.4	45.0	10.6	
Level of Service		D	D		D	D	D	B	D	D	B	
Approach Delay (s)		51.1			42.5			19.0			14.5	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM Average Control Delay			21.3				HCM Level of Service				C	
HCM Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)				12.0	
Intersection Capacity Utilization			63.0%				ICU Level of Service				B	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings AM_Scenario 3

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	148	116	131	241	111	388	36	239	76	349	686	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-2%			0%			0%	
Total Lost time (s)	5.7	5.7		3.1	5.7	3.1	6.0	3.0	3.0	3.4	3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.92		1.00	0.91	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1678	1603		1663	1520	1413	1646	3292	1442	3255	1766	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1678	1603		1663	1520	1413	1646	3292	1442	3255	1766	
Peak-hour factor, PHF	0.66	0.66	0.66	0.90	0.90	0.90	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	224	176	198	268	123	431	41	272	86	392	771	0
RTOR Reduction (vph)	0	22	0	0	0	0	0	0	61	0	0	0
Lane Group Flow (vph)	224	352	0	268	287	267	41	272	25	392	771	0
Confl. Peds. (#/hr)			3						7			3
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	6%	6%	6%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	20.2	32.3		26.0	38.1	38.1	6.8	36.8	36.8	20.4	50.4	
Effective Green, g (s)	20.2	32.3		28.6	38.1	40.7	6.8	39.8	39.8	23.0	53.4	
Actuated g/C Ratio	0.15	0.23		0.21	0.27	0.29	0.05	0.29	0.29	0.17	0.38	
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	244	373		342	417	414	81	943	413	539	679	
v/s Ratio Prot	c0.13	c0.22		c0.16	0.19		0.02	0.08		c0.12	c0.44	
v/s Ratio Perm						0.19			0.02			
v/c Ratio	0.92	0.94		0.78	0.69	0.64	0.51	0.29	0.06	0.73	1.14	
Uniform Delay, d1	58.5	52.4		52.2	45.1	42.8	64.4	38.5	36.0	55.0	42.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	35.4	31.8		10.3	3.7	2.6	1.8	0.1	0.0	4.1	78.3	
Delay (s)	93.9	84.2		62.6	48.8	45.4	66.2	38.6	36.0	59.1	121.0	
Level of Service	F	F		E	D	D	E	D	D	E	F	
Approach Delay (s)		87.8			52.2			40.9			100.2	
Approach LOS		F			D			D			F	
Intersection Summary												
HCM Average Control Delay			76.5			HCM Level of Service			E			
HCM Volume to Capacity ratio			1.00									
Actuated Cycle Length (s)			138.9			Sum of lost time (s)			17.8			
Intersection Capacity Utilization			85.5%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

870: Sahalee Way NE & 223rd AVE NE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings PM_Scenario 3

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	887	94	12	478	18	24	2	15	10	2	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.88	0.88	0.88	0.71	0.71	0.71	0.64	0.64	0.64
Hourly flow rate (vph)	13	975	103	14	543	20	34	3	21	16	3	12
Pedestrians					2			2			1	
Lane Width (ft)					11.0			11.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	565			1080			1639	1647	1030	1607	1688	554
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	565			1080			1639	1647	1030	1607	1688	554
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			55	97	93	79	97	98
cM capacity (veh/h)	1016			652			75	97	285	75	91	535
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	13	1078	14	564	58	31						
Volume Left	13	0	14	0	34	16						
Volume Right	0	103	0	20	21	12						
cSH	1016	1700	652	1700	104	118						
Volume to Capacity	0.01	0.63	0.02	0.33	0.55	0.27						
Queue Length 95th (ft)	1	0	2	0	65	25						
Control Delay (s)	8.6	0.0	10.6	0.0	75.9	46.4						
Lane LOS	A		B		F	E						
Approach Delay (s)	0.1		0.3		75.9	46.4						
Approach LOS					F	E						
Intersection Summary												
Average Delay			3.5									
Intersection Capacity Utilization			63.1%		ICU Level of Service		B					
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings PM_Scenario 3

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	107	208	184	320	105	122	158	651	373	230	528	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			0%			2%	
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1745	1837	1546	1728	1818	1546	1728	3239		1710	3369	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1745	1837	1546	1728	1818	1546	1728	3239		1710	3369	
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	120	234	207	356	117	136	172	708	405	253	580	54
RTOR Reduction (vph)	0	0	90	0	0	75	0	40	0	0	3	0
Lane Group Flow (vph)	120	234	117	356	117	61	172	1073	0	253	631	0
Confl. Peds. (#/hr)			2									1
Confl. Bikes (#/hr)									3			2
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot			Prot		
Protected Phases	3	8	5	7	4	1	5	2		1	6	
Permitted Phases			8			4						
Actuated Green, G (s)	17.0	27.6	49.6	35.5	45.7	75.3	22.0	63.0		29.6	70.6	
Effective Green, g (s)	19.0	29.6	53.6	37.5	48.1	79.3	24.0	65.3		31.6	72.9	
Actuated g/C Ratio	0.11	0.17	0.30	0.21	0.27	0.45	0.14	0.37		0.18	0.41	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.4	5.0	5.0	5.3		5.0	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	188	309	497	368	497	697	236	1202		307	1395	
v/s Ratio Prot	0.07	c0.13	0.03	c0.21	0.06	0.02	0.10	c0.33		c0.15	0.19	
v/s Ratio Perm			0.04			0.02						
v/c Ratio	0.64	0.76	0.24	0.97	0.24	0.09	0.73	0.89		0.82	0.45	
Uniform Delay, d1	75.2	69.8	45.9	68.6	49.7	27.7	72.9	52.1		69.5	37.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.1	9.1	0.1	37.7	0.1	0.0	9.2	8.5		15.5	0.1	
Delay (s)	80.4	78.8	45.9	106.4	49.8	27.7	82.0	60.6		85.0	37.2	
Level of Service	F	E	D	F	D	C	F	E		F	D	
Approach Delay (s)		67.0			77.9			63.5			50.9	
Approach LOS		E			E			E			D	
Intersection Summary												
HCM Average Control Delay			63.4				HCM Level of Service			E		
HCM Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			176.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			84.9%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings PM_Scenario 3

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	100	17	135	150	11	100	129	72	820	260	1	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%				-2%			
Total Lost time (s)		2.0	4.0		3.0	3.0		2.0	3.0			2.5
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00	0.95			1.00
Frpb, ped/bikes		1.00	0.98		1.00	1.00		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.85		1.00	0.85		1.00	0.96			1.00
Flt Protected		0.96	1.00		0.96	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1762	1536		1716	1531		1745	3336			1710
Flt Permitted		0.61	1.00		0.56	1.00		0.18	1.00			0.18
Satd. Flow (perm)		1124	1536		998	1531		322	3336			328
Peak-hour factor, PHF	0.78	0.78	0.78	0.82	0.82	0.82	0.96	0.96	0.96	0.96	0.94	0.94
Adj. Flow (vph)	128	22	173	183	13	122	134	75	854	271	1	53
RTOR Reduction (vph)	0	0	58	0	0	84	0	0	13	0	0	0
Lane Group Flow (vph)	0	150	115	0	196	38	0	209	1112	0	0	54
Confl. Peds. (#/hr)			4	4				5		5		5
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm		Perm	Perm		Perm	pm+pt	pm+pt			pm+pt	pm+pt
Protected Phases		8			4		5	5	2		1	1
Permitted Phases	8		8	4		4	2	2			6	6
Actuated Green, G (s)		25.2	25.2		25.2	25.2		51.9	42.3			39.3
Effective Green, g (s)		28.2	26.2		27.2	27.2		54.9	45.3			44.3
Actuated g/C Ratio		0.32	0.30		0.31	0.31		0.62	0.51			0.50
Clearance Time (s)		5.0	5.0		5.0	5.0		5.0	6.0			5.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)		360	457		308	473		446	1715			276
v/s Ratio Prot								c0.08	c0.33			0.02
v/s Ratio Perm		0.13	0.08		c0.20	0.02		0.21				0.08
v/c Ratio		0.42	0.25		0.64	0.08		0.47	0.65			0.20
Uniform Delay, d1		23.5	23.5		26.2	21.6		9.8	15.6			11.9
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		0.3	0.1		3.2	0.0		0.3	0.6			0.1
Delay (s)		23.8	23.6		29.3	21.6		10.1	16.2			12.1
Level of Service		C	C		C	C		B	B			B
Approach Delay (s)		23.7			26.4				15.3			
Approach LOS		C			C				B			
Intersection Summary												
HCM Average Control Delay			19.0			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			88.1			Sum of lost time (s)			5.0			
Intersection Capacity Utilization			67.0%			ICU Level of Service			C			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings PM_Scenario 3



Movement	SBT	SBR
Lane Configurations	↑↑	↑
Volume (vph)	749	111
Ideal Flow (vphpl)	1900	1900
Grade (%)	2%	
Total Lost time (s)	3.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.98	
Flt Protected	1.00	
Satd. Flow (prot)	3340	
Flt Permitted	1.00	
Satd. Flow (perm)	3340	
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	797	118
RTOR Reduction (vph)	6	0
Lane Group Flow (vph)	909	0
Confl. Peds. (#/hr)		5
Heavy Vehicles (%)	1%	1%
Turn Type		
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	34.7	
Effective Green, g (s)	37.7	
Actuated g/C Ratio	0.43	
Clearance Time (s)	6.0	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	1429	
v/s Ratio Prot	0.27	
v/s Ratio Perm		
v/c Ratio	0.64	
Uniform Delay, d1	19.8	
Progression Factor	1.00	
Incremental Delay, d2	0.7	
Delay (s)	20.5	
Level of Service	C	
Approach Delay (s)	20.0	
Approach LOS	C	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis

650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings PM_Scenario 3



Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Volume (vph)	43	238	1	184	1147	1	845	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%				0%		-3%	
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	0.85		1.00	1.00	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1745	1533		1728	3455	1736	3430	
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1745	1533		1728	3455	1736	3430	
Peak-hour factor, PHF	0.93	0.93	0.96	0.96	0.96	0.94	0.94	0.94
Adj. Flow (vph)	46	256	1	192	1195	1	899	81
RTOR Reduction (vph)	0	222	0	0	0	0	4	0
Lane Group Flow (vph)	46	34	0	193	1195	1	976	0
Confl. Peds. (#/hr)	3	2						
Heavy Vehicles (%)	0%	0%	1%	1%	1%	2%	2%	2%
Turn Type		Perm	Prot	Prot		Prot		
Protected Phases	8		5	5	2	1	6	
Permitted Phases	8	8						
Actuated Green, G (s)	8.6	8.6		17.6	82.8	1.0	66.6	
Effective Green, g (s)	11.2	11.2		20.2	85.8	4.0	69.6	
Actuated g/C Ratio	0.10	0.10		0.18	0.78	0.04	0.63	
Clearance Time (s)	5.6	5.6		5.6	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0		3.0	3.0	2.0	2.0	
Lane Grp Cap (vph)	178	156		317	2695	63	2170	
v/s Ratio Prot	c0.03			c0.11	c0.35	0.00	0.28	
v/s Ratio Perm		0.02						
v/c Ratio	0.26	0.22		0.61	0.44	0.02	0.45	
Uniform Delay, d1	45.6	45.4		41.3	4.1	51.1	10.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.3		3.3	0.5	0.0	0.7	
Delay (s)	45.9	45.6		44.6	4.6	51.1	11.0	
Level of Service	D	D		D	A	D	B	
Approach Delay (s)	45.7				10.2		11.1	
Approach LOS	D				B		B	

Intersection Summary

HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings PM_Scenario 3

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	6	2	5	107	1	205	7	1145	215	1	307	827
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	3.0	3.0	2.3		3.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00	0.99		1.00	0.98	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85		1.00	1.00
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1770	1539		1733	1516	1728	3455	1546		1728	3451
Flt Permitted		0.96	1.00		0.95	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1770	1539		1733	1516	1728	3455	1546		1728	3451
Peak-hour factor, PHF	0.67	0.67	0.67	0.82	0.82	0.82	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	9	3	7	130	1	250	8	1245	234	1	353	951
RTOR Reduction (vph)	0	0	7	0	0	215	0	0	182	0	0	0
Lane Group Flow (vph)	0	12	0	0	131	35	8	1245	52	0	354	956
Confl. Peds. (#/hr)			2			5			5			
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split		Perm	Split		Perm	Prot		Over	Prot	Prot	
Protected Phases	3	3		4	4		5	2	4	1	1	6
Permitted Phases			3			4						
Actuated Green, G (s)		2.5	2.5		13.0	13.0	1.3	33.4	13.0		37.8	69.9
Effective Green, g (s)		5.5	5.5		15.3	15.3	4.3	36.4	16.0		40.8	71.9
Actuated g/C Ratio		0.05	0.05		0.14	0.14	0.04	0.33	0.15		0.37	0.65
Clearance Time (s)		6.0	6.0		5.3	5.3	6.0	6.0	5.3		6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		89	77		241	211	68	1143	225		641	2256
v/s Ratio Prot		c0.01			c0.08		0.00	c0.36	0.03		c0.20	0.28
v/s Ratio Perm			0.00			0.02						
v/c Ratio		0.13	0.00		0.54	0.16	0.12	1.09	0.23		0.55	0.42
Uniform Delay, d1		50.0	49.6		44.1	41.7	51.0	36.8	41.6		27.4	9.1
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3	0.0		1.3	0.1	0.3	54.4	0.2		0.6	0.6
Delay (s)		50.2	49.7		45.4	41.9	51.3	91.2	41.8		28.0	9.7
Level of Service		D	D		D	D	D	F	D		C	A
Approach Delay (s)		50.0			43.1			83.2				14.6
Approach LOS		D			D			F				B
Intersection Summary												
HCM Average Control Delay			50.1				HCM Level of Service			D		
HCM Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			81.5%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Movement	SBR
Lane Configurations	
Volume (vph)	4
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.87
Adj. Flow (vph)	5
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	9
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings PM_Scenario 3

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	218	116	50	165	130	459	37	647	190	496	373	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-2%			0%			0%	
Total Lost time (s)	5.7	5.7		3.1	5.7	3.1	6.0	3.0	3.0	3.4	3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.91	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1662	1647		1745	1595	1483	1728	3455	1512	3319	1801	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1662	1647		1745	1595	1483	1728	3455	1512	3319	1801	
Peak-hour factor, PHF	0.95	0.95	0.95	0.94	0.94	0.94	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	229	122	53	176	138	488	41	719	211	551	414	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	142	0	0	0
Lane Group Flow (vph)	229	167	0	176	323	303	41	719	69	551	414	0
Confl. Peds. (#/hr)			12						8			2
Heavy Vehicles (%)	5%	5%	5%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	20.2	33.2		18.3	31.3	31.3	6.6	34.5	34.5	25.3	53.2	
Effective Green, g (s)	20.2	33.2		20.9	31.3	33.9	6.6	37.5	37.5	27.9	56.2	
Actuated g/C Ratio	0.15	0.25		0.16	0.23	0.25	0.05	0.28	0.28	0.21	0.42	
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	249	406		271	371	373	85	962	421	687	751	
v/s Ratio Prot	c0.14	0.10		0.10	0.20		0.02	c0.21		c0.17	0.23	
v/s Ratio Perm						c0.20			0.05			
v/c Ratio	0.92	0.41		0.65	0.87	0.81	0.48	0.75	0.16	0.80	0.55	
Uniform Delay, d1	56.5	42.5		53.5	49.8	47.4	62.4	44.3	36.7	50.8	29.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	35.2	0.2		4.0	18.9	12.0	1.6	2.8	0.1	6.3	0.5	
Delay (s)	91.6	42.8		57.4	68.6	59.4	64.0	47.1	36.8	57.1	30.2	
Level of Service	F	D		E	E	E	E	D	D	E	C	
Approach Delay (s)		70.5			62.7			45.6			45.6	
Approach LOS		E			E			D			D	
Intersection Summary												
HCM Average Control Delay			53.1			HCM Level of Service			D			
HCM Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			134.7			Sum of lost time (s)			15.2			
Intersection Capacity Utilization			78.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

870: Sahalee Way NE & 223rd AVE NE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+OptimzTimings AM_Scenario 4

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	369	33	1	941	0	85	1	13	6	0	17
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.88	0.88	0.88	0.94	0.94	0.94	0.73	0.73	0.73	0.83	0.83	0.83
Hourly flow rate (vph)	6	419	38	1	1001	0	116	1	18	7	0	20
Pedestrians				1			1			2		
Lane Width (ft)				11.0			11.0			12.0		
Walking Speed (ft/s)				4.0			4.0			4.0		
Percent Blockage				0			0			0		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1003			458			1474	1456	440	1455	1474	1003
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1003			458			1474	1456	440	1455	1474	1003
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			0	99	97	93	100	93
cM capacity (veh/h)	689			1113			97	130	620	104	126	296
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	6	457	1	1001	136	28						
Volume Left	6	0	1	0	116	7						
Volume Right	0	38	0	0	18	20						
cSH	689	1700	1113	1700	110	200						
Volume to Capacity	0.01	0.27	0.00	0.59	1.23	0.14						
Queue Length 95th (ft)	1	0	0	0	223	12						
Control Delay (s)	10.3	0.0	8.2	0.0	235.0	25.9						
Lane LOS	B		A		F	D						
Approach Delay (s)	0.1		0.0		235.0	25.9						
Approach LOS					F	D						
Intersection Summary												
Average Delay			20.1									
Intersection Capacity Utilization			68.5%		ICU Level of Service				C			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+OptimzTimings AM_Scenario 4

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	104	123	187	557	134	110	134	632	221	124	699	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			0%			2%	
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1678	1766	1480	1678	1766	1481	1694	3216		1694	3348	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1678	1766	1480	1678	1766	1481	1694	3216		1694	3348	
Peak-hour factor, PHF	0.70	0.70	0.70	0.71	0.71	0.71	0.79	0.79	0.79	0.79	0.79	0.79
Adj. Flow (vph)	149	176	267	785	189	155	170	800	280	157	885	62
RTOR Reduction (vph)	0	0	42	0	0	63	0	25	0	0	4	0
Lane Group Flow (vph)	149	176	225	785	189	92	170	1055	0	157	943	0
Confl. Peds. (#/hr)			5			2			7			1
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot			Prot		
Protected Phases	3	8	5	7	4	1	5	2		1	6	
Permitted Phases			8			4						
Actuated Green, G (s)	15.7	15.7	26.7	55.0	54.6	62.6	11.0	39.7		8.0	36.7	
Effective Green, g (s)	17.7	17.7	30.7	57.0	57.0	66.6	13.0	42.0		10.0	39.0	
Actuated g/C Ratio	0.13	0.13	0.22	0.41	0.41	0.48	0.09	0.30		0.07	0.28	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.4	5.0	5.0	5.3		5.0	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	214	225	360	690	726	711	159	974		122	941	
v/s Ratio Prot	0.09	c0.10	0.06	c0.47	0.11	0.01	0.10	c0.33		c0.09	0.28	
v/s Ratio Perm			0.09			0.05						
v/c Ratio	0.70	0.78	0.62	1.14	0.26	0.13	1.07	1.08		1.29	1.00	
Uniform Delay, d1	57.9	58.6	48.8	40.8	26.9	20.0	62.8	48.3		64.3	49.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.7	15.0	2.4	78.9	0.1	0.0	91.0	54.0		177.3	30.0	
Delay (s)	65.6	73.6	51.2	119.7	27.0	20.0	153.8	102.4		241.6	79.8	
Level of Service	E	E	D	F	C	C	F	F		F	E	
Approach Delay (s)		61.5			90.5			109.4			102.8	
Approach LOS		E			F			F			F	
Intersection Summary												
HCM Average Control Delay			95.4	HCM Level of Service					F			
HCM Volume to Capacity ratio			1.08									
Actuated Cycle Length (s)			138.7	Sum of lost time (s)					12.0			
Intersection Capacity Utilization			83.4%	ICU Level of Service					E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+OptimizTimings AM_Scenario 4

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	3	186	254	16	188	57	616	76	17	589	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-2%			2%	
Total Lost time (s)		2.0	4.0		3.0	3.0	1.0	3.0		1.5	3.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1758	1541		1735	1546	1711	3357		1661	3256	
Flt Permitted		0.73	1.00		0.71	1.00	0.26	1.00		0.20	1.00	
Satd. Flow (perm)		1339	1541		1290	1546	471	3357		352	3256	
Peak-hour factor, PHF	0.75	0.75	0.75	0.93	0.93	0.93	0.70	0.70	0.70	0.89	0.89	0.89
Adj. Flow (vph)	35	4	248	273	17	202	81	880	109	19	662	85
RTOR Reduction (vph)	0	0	123	0	0	131	0	8	0	0	9	0
Lane Group Flow (vph)	0	39	125	0	290	71	81	981	0	19	738	0
Confl. Peds. (#/hr)			1	1			2		2	2		2
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	3%	3%	3%	4%	4%	4%
Turn Type	Perm		Perm	Perm		Perm	pm+pt			pm+pt		
Protected Phases		8			4		5	2			1	6
Permitted Phases	8		8	4		4	2			6		
Actuated Green, G (s)		18.6	18.6		18.6	18.6	27.1	24.0		22.3	21.6	
Effective Green, g (s)		21.6	19.6		20.6	20.6	31.7	27.0		27.3	24.6	
Actuated g/C Ratio		0.37	0.34		0.35	0.35	0.54	0.46		0.47	0.42	
Clearance Time (s)		5.0	5.0		5.0	5.0	4.0	6.0		4.0	6.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)		496	518		456	546	386	1555		237	1374	
v/s Ratio Prot							c0.02	c0.29		0.00	0.23	
v/s Ratio Perm		0.03	0.08		c0.22	0.05	0.09			0.03		
v/c Ratio		0.08	0.24		0.64	0.13	0.21	0.63		0.08	0.54	
Uniform Delay, d1		11.9	14.0		15.7	12.8	6.9	11.9		8.8	12.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.1		2.1	0.0	0.3	0.6		0.1	0.2	
Delay (s)		11.9	14.1		17.9	12.8	7.2	12.5		9.0	12.8	
Level of Service		B	B		B	B	A	B		A	B	
Approach Delay (s)		13.8			15.8			12.1			12.7	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			13.1				HCM Level of Service				B	
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			58.3				Sum of lost time (s)				4.0	
Intersection Capacity Utilization			62.0%				ICU Level of Service				B	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+OptimizTimings AM_Scenario 4



Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Volume (vph)	67	94	1	156	789	0	764	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%				0%		-3%	
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.85		1.00	1.00		0.99	
Flt Protected	0.95	1.00		0.95	1.00		1.00	
Satd. Flow (prot)	1711	1505		1678	3355		3376	
Flt Permitted	0.95	1.00		0.95	1.00		1.00	
Satd. Flow (perm)	1711	1505		1678	3355		3376	
Peak-hour factor, PHF	0.65	0.65	0.69	0.69	0.69	0.82	0.82	0.82
Adj. Flow (vph)	103	145	1	226	1143	0	932	48
RTOR Reduction (vph)	0	127	0	0	0	0	3	0
Lane Group Flow (vph)	103	18	0	227	1143	0	977	0
Confl. Peds. (#/hr)	2	2						2
Heavy Vehicles (%)	2%	2%	4%	4%	4%	4%	4%	4%
Turn Type		Perm	Prot	Prot		Prot		
Protected Phases	8		5	5	2	1	6	
Permitted Phases	8	8						
Actuated Green, G (s)	11.0	11.0		20.0	87.4		61.8	
Effective Green, g (s)	13.6	13.6		22.6	90.4		64.8	
Actuated g/C Ratio	0.12	0.12		0.21	0.82		0.59	
Clearance Time (s)	5.6	5.6		5.6	6.0		6.0	
Vehicle Extension (s)	2.0	2.0		3.0	3.0		2.0	
Lane Grp Cap (vph)	212	186		345	2757		1989	
v/s Ratio Prot	c0.06			c0.14	0.34		c0.29	
v/s Ratio Perm		0.01						
v/c Ratio	0.49	0.10		0.66	0.41		0.49	
Uniform Delay, d1	44.9	42.8		40.1	2.6		13.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.6	0.1		4.5	0.5		0.9	
Delay (s)	45.6	42.8		44.6	3.1		13.9	
Level of Service	D	D		D	A		B	
Approach Delay (s)	44.0				10.0		13.9	
Approach LOS	D				A		B	

Intersection Summary

HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+OptimzTimings AM_Scenario 4

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	0	1	128	0	294	2	711	82	114	868	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	3.0	3.0	2.3	3.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1745	1539		1694	1493	1678	3355	1501	1678	3355	
Flt Permitted		0.95	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1745	1539		1694	1493	1678	3355	1501	1678	3355	
Peak-hour factor, PHF	0.42	0.42	0.42	0.84	0.84	0.84	0.76	0.76	0.76	0.80	0.80	0.80
Adj. Flow (vph)	5	0	2	152	0	350	3	936	108	142	1085	1
RTOR Reduction (vph)	0	0	2	0	0	297	0	0	91	0	0	0
Lane Group Flow (vph)	0	5	0	0	152	53	3	936	17	142	1086	0
Confl. Peds. (#/hr)			2			1			3			2
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Split		Perm	Split		Perm	Prot		Over		Prot	
Protected Phases	3	3		4	4		5	2	4	1	6	
Permitted Phases			3			4						
Actuated Green, G (s)		1.2	1.2		14.5	14.5	1.1	57.4	14.5	13.6	69.9	
Effective Green, g (s)		4.2	4.2		16.8	16.8	4.1	60.4	17.5	16.6	71.9	
Actuated g/C Ratio		0.04	0.04		0.15	0.15	0.04	0.55	0.16	0.15	0.65	
Clearance Time (s)		6.0	6.0		5.3	5.3	6.0	6.0	5.3	6.0	6.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		67	59		259	228	63	1842	239	253	2193	
v/s Ratio Prot		c0.00			c0.09		0.00	c0.28	0.01	c0.08	0.32	
v/s Ratio Perm			0.00			0.04						
v/c Ratio		0.07	0.00		0.59	0.23	0.05	0.51	0.07	0.56	0.50	
Uniform Delay, d1		51.0	50.9		43.4	40.9	51.1	15.5	39.3	43.3	9.8	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2	0.0		2.2	0.2	0.1	1.0	0.0	1.7	0.8	
Delay (s)		51.2	50.9		45.6	41.1	51.2	16.5	39.4	45.0	10.6	
Level of Service		D	D		D	D	D	B	D	D	B	
Approach Delay (s)		51.1			42.5			19.0			14.5	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM Average Control Delay		21.3										
HCM Volume to Capacity ratio		0.51										
Actuated Cycle Length (s)		110.0										
Intersection Capacity Utilization		63.0%										
Analysis Period (min)		15										
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+OptimizTimings AM_Scenario 4

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	148	116	131	241	111	388	36	239	76	349	686	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-2%			0%			0%	
Total Lost time (s)	5.7	5.7		3.1	5.7	3.1	6.0	3.0	3.0	3.4	3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.92		1.00	0.91	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1678	1603		1663	1520	1413	1646	3292	1442	3255	1766	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1678	1603		1663	1520	1413	1646	3292	1442	3255	1766	
Peak-hour factor, PHF	0.66	0.66	0.66	0.90	0.90	0.90	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	224	176	198	268	123	431	41	272	86	392	771	0
RTOR Reduction (vph)	0	29	0	0	0	0	0	0	60	0	0	0
Lane Group Flow (vph)	224	345	0	268	287	267	41	272	26	392	771	0
Confl. Peds. (#/hr)			3						7			3
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	6%	6%	6%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	20.7	30.4		23.3	33.0	33.0	3.8	38.5	38.5	19.3	54.0	
Effective Green, g (s)	20.7	30.4		25.9	33.0	35.6	3.8	41.5	41.5	21.9	57.0	
Actuated g/C Ratio	0.15	0.23		0.19	0.24	0.26	0.03	0.31	0.31	0.16	0.42	
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	257	361		319	372	373	46	1013	444	528	746	
v/s Ratio Prot	0.13	c0.21		c0.16	c0.19		0.02	0.08		c0.12	c0.44	
v/s Ratio Perm						0.19			0.02			
v/c Ratio	0.87	0.95		0.84	0.77	0.72	0.89	0.27	0.06	0.74	1.03	
Uniform Delay, d1	55.8	51.6		52.5	47.4	45.1	65.3	35.2	32.9	53.8	39.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	25.3	35.1		17.1	8.7	5.4	90.4	0.1	0.0	4.9	41.9	
Delay (s)	81.1	86.6		69.6	56.2	50.4	155.7	35.3	33.0	58.7	80.8	
Level of Service	F	F		E	E	D	F	D	C	E	F	
Approach Delay (s)		84.6			58.7			47.2			73.4	
Approach LOS		F			E			D			E	
Intersection Summary												
HCM Average Control Delay			68.1			HCM Level of Service			E			
HCM Volume to Capacity ratio			1.00									
Actuated Cycle Length (s)			134.9			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			85.5%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

870: Sahalee Way NE & 223rd AVE NE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+OptimizTimings PM_Scenario 4

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	887	94	12	478	18	24	2	15	10	2	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.88	0.88	0.88	0.71	0.71	0.71	0.64	0.64	0.64
Hourly flow rate (vph)	13	975	103	14	543	20	34	3	21	16	3	12
Pedestrians					2			2			1	
Lane Width (ft)					11.0			11.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	565			1080			1639	1647	1030	1607	1688	554
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	565			1080			1639	1647	1030	1607	1688	554
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			55	97	93	79	97	98
cM capacity (veh/h)	1016			652			75	97	285	75	91	535
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	13	1078	14	564	58	31						
Volume Left	13	0	14	0	34	16						
Volume Right	0	103	0	20	21	12						
cSH	1016	1700	652	1700	104	118						
Volume to Capacity	0.01	0.63	0.02	0.33	0.55	0.27						
Queue Length 95th (ft)	1	0	2	0	65	25						
Control Delay (s)	8.6	0.0	10.6	0.0	75.9	46.4						
Lane LOS	A		B		F	E						
Approach Delay (s)	0.1		0.3		75.9	46.4						
Approach LOS					F	E						
Intersection Summary												
Average Delay			3.5									
Intersection Capacity Utilization			63.1%		ICU Level of Service		B					
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+OptimizTimings PM_Scenario 4

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	107	208	184	320	105	122	158	651	373	230	528	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			0%			2%	
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1745	1837	1548	1728	1818	1546	1728	3239		1710	3370	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1745	1837	1548	1728	1818	1546	1728	3239		1710	3370	
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	120	234	207	356	117	136	172	708	405	253	580	54
RTOR Reduction (vph)	0	0	56	0	0	78	0	88	0	0	8	0
Lane Group Flow (vph)	120	234	151	356	117	58	172	1025	0	253	626	0
Confl. Peds. (#/hr)			2									1
Confl. Bikes (#/hr)									3			2
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot			Prot		
Protected Phases	3	8	5	7	4	1	5	2		1	6	
Permitted Phases			8			4						
Actuated Green, G (s)	7.6	14.2	25.6	16.0	22.2	33.2	11.4	25.8		11.0	25.4	
Effective Green, g (s)	9.6	16.2	29.6	18.0	24.6	37.2	13.4	28.1		13.0	27.7	
Actuated g/C Ratio	0.11	0.19	0.34	0.21	0.28	0.43	0.15	0.32		0.15	0.32	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.4	5.0	5.0	5.3		5.0	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	192	341	578	356	512	659	265	1043		255	1069	
v/s Ratio Prot	0.07	c0.13	0.04	c0.21	0.06	0.01	0.10	c0.32		c0.15	0.19	
v/s Ratio Perm			0.06			0.02						
v/c Ratio	0.62	0.69	0.26	1.00	0.23	0.09	0.65	0.98		0.99	0.59	
Uniform Delay, d1	37.1	33.2	20.9	34.6	24.1	14.9	34.7	29.4		37.1	25.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.5	4.5	0.1	47.7	0.1	0.0	4.1	23.5		53.9	0.5	
Delay (s)	41.6	37.7	21.0	82.3	24.1	15.0	38.8	52.8		91.0	25.5	
Level of Service	D	D	C	F	C	B	D	D		F	C	
Approach Delay (s)		32.4			56.1			51.0			44.2	
Approach LOS		C			E			D			D	
Intersection Summary												
HCM Average Control Delay			47.0				HCM Level of Service			D		
HCM Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			87.3				Sum of lost time (s)			9.0		
Intersection Capacity Utilization			84.9%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+OptimizTimings PM_Scenario 4

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	100	17	135	150	11	100	129	72	820	260	1	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%				-2%			
Total Lost time (s)		2.0	4.0		3.0	3.0		2.0	3.0			2.5
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00	0.95			1.00
Frpb, ped/bikes		1.00	0.98		1.00	1.00		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.85		1.00	0.85		1.00	0.96			1.00
Flt Protected		0.96	1.00		0.96	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1762	1538		1717	1531		1745	3337			1710
Flt Permitted		0.67	1.00		0.62	1.00		0.13	1.00			0.15
Satd. Flow (perm)		1235	1538		1111	1531		248	3337			265
Peak-hour factor, PHF	0.78	0.78	0.78	0.82	0.82	0.82	0.96	0.96	0.96	0.96	0.94	0.94
Adj. Flow (vph)	128	22	173	183	13	122	134	75	854	271	1	53
RTOR Reduction (vph)	0	0	50	0	0	73	0	0	29	0	0	0
Lane Group Flow (vph)	0	150	123	0	196	49	0	209	1096	0	0	54
Confl. Peds. (#/hr)			4	4				5		5		5
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm		Perm	Perm		Perm	pm+pt	pm+pt			pm+pt	pm+pt
Protected Phases		8			4		5	5	2		1	1
Permitted Phases	8		8	4		4	2	2			6	6
Actuated Green, G (s)		28.6	28.6		28.6	28.6		36.2	28.9			27.8
Effective Green, g (s)		31.6	29.6		30.6	30.6		40.0	31.9			32.8
Actuated g/C Ratio		0.41	0.39		0.40	0.40		0.52	0.42			0.43
Clearance Time (s)		5.0	5.0		5.0	5.0		5.0	6.0			5.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)		509	594		444	612		331	1390			219
v/s Ratio Prot								c0.08	c0.33			0.02
v/s Ratio Perm		0.12	0.08		c0.18	0.03		0.25				0.09
v/c Ratio		0.29	0.21		0.44	0.08		0.63	0.79			0.25
Uniform Delay, d1		15.0	15.7		16.8	14.3		12.9	19.4			14.5
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		0.1	0.1		0.3	0.0		2.9	2.8			0.2
Delay (s)		15.2	15.7		17.0	14.3		15.7	22.2			14.7
Level of Service		B	B		B	B		B	C			B
Approach Delay (s)		15.5			16.0				21.2			
Approach LOS		B			B				C			
Intersection Summary												
HCM Average Control Delay			20.7			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			76.6			Sum of lost time (s)			5.0			
Intersection Capacity Utilization			67.0%			ICU Level of Service			C			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+OptimizTimings PM_Scenario 4



Movement	SBT	SBR
Lane Configurations	↑↑	↑
Volume (vph)	749	111
Ideal Flow (vphpl)	1900	1900
Grade (%)	2%	
Total Lost time (s)	3.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.98	
Flt Protected	1.00	
Satd. Flow (prot)	3341	
Flt Permitted	1.00	
Satd. Flow (perm)	3341	
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	797	118
RTOR Reduction (vph)	12	0
Lane Group Flow (vph)	903	0
Confl. Peds. (#/hr)		5
Heavy Vehicles (%)	1%	1%
Turn Type		
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	24.7	
Effective Green, g (s)	27.7	
Actuated g/C Ratio	0.36	
Clearance Time (s)	6.0	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	1208	
v/s Ratio Prot	0.27	
v/s Ratio Perm		
v/c Ratio	0.75	
Uniform Delay, d1	21.4	
Progression Factor	1.00	
Incremental Delay, d2	2.2	
Delay (s)	23.6	
Level of Service	C	
Approach Delay (s)	23.1	
Approach LOS	C	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis

650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+OptimizTimings PM_Scenario 4



Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Volume (vph)	43	238	1	184	1147	1	845	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%				0%		-3%	
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	0.85		1.00	1.00	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1745	1533		1728	3455	1736	3430	
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1745	1533		1728	3455	1736	3430	
Peak-hour factor, PHF	0.93	0.93	0.96	0.96	0.96	0.94	0.94	0.94
Adj. Flow (vph)	46	256	1	192	1195	1	899	81
RTOR Reduction (vph)	0	231	0	0	0	0	4	0
Lane Group Flow (vph)	46	25	0	193	1195	1	976	0
Confl. Peds. (#/hr)	3	2						
Heavy Vehicles (%)	0%	0%	1%	1%	1%	2%	2%	2%
Turn Type		Perm	Prot	Prot		Prot		
Protected Phases	8		5	5	2	1	6	
Permitted Phases	8	8						
Actuated Green, G (s)	8.3	8.3		17.4	83.1	1.0	67.1	
Effective Green, g (s)	10.9	10.9		20.0	86.1	4.0	70.1	
Actuated g/C Ratio	0.10	0.10		0.18	0.78	0.04	0.64	
Clearance Time (s)	5.6	5.6		5.6	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0		3.0	3.0	2.0	2.0	
Lane Grp Cap (vph)	173	152		314	2704	63	2186	
v/s Ratio Prot	c0.03			c0.11	c0.35	0.00	0.28	
v/s Ratio Perm		0.02						
v/c Ratio	0.27	0.17		0.61	0.44	0.02	0.45	
Uniform Delay, d1	45.8	45.4		41.5	4.0	51.1	10.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.2		3.5	0.5	0.0	0.7	
Delay (s)	46.1	45.6		45.0	4.5	51.1	10.8	
Level of Service	D	D		D	A	D	B	
Approach Delay (s)	45.7				10.1		10.8	
Approach LOS	D				B		B	

Intersection Summary

HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+OptimizTimings PM_Scenario 4

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	6	2	5	107	1	205	7	1145	215	1	307	827
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	3.0	3.0	2.3		3.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00	0.99		1.00	0.98	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85		1.00	1.00
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1770	1539		1733	1516	1728	3455	1546		1728	3451
Flt Permitted		0.96	1.00		0.95	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1770	1539		1733	1516	1728	3455	1546		1728	3451
Peak-hour factor, PHF	0.67	0.67	0.67	0.82	0.82	0.82	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	9	3	7	130	1	250	8	1245	234	1	353	951
RTOR Reduction (vph)	0	0	7	0	0	215	0	0	182	0	0	0
Lane Group Flow (vph)	0	12	0	0	131	35	8	1245	52	0	354	956
Confl. Peds. (#/hr)			2			5			5			
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split		Perm	Split		Perm	Prot		Over	Prot	Prot	
Protected Phases	3	3		4	4		5	2	4	1	1	6
Permitted Phases			3			4						
Actuated Green, G (s)		2.5	2.5		13.0	13.0	1.3	33.4	13.0		37.8	69.9
Effective Green, g (s)		5.5	5.5		15.3	15.3	4.3	36.4	16.0		40.8	71.9
Actuated g/C Ratio		0.05	0.05		0.14	0.14	0.04	0.33	0.15		0.37	0.65
Clearance Time (s)		6.0	6.0		5.3	5.3	6.0	6.0	5.3		6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		89	77		241	211	68	1143	225		641	2256
v/s Ratio Prot		c0.01			c0.08		0.00	c0.36	0.03		c0.20	0.28
v/s Ratio Perm			0.00			0.02						
v/c Ratio		0.13	0.00		0.54	0.16	0.12	1.09	0.23		0.55	0.42
Uniform Delay, d1		50.0	49.6		44.1	41.7	51.0	36.8	41.6		27.4	9.1
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3	0.0		1.3	0.1	0.3	54.4	0.2		0.6	0.6
Delay (s)		50.2	49.7		45.4	41.9	51.3	91.2	41.8		28.0	9.7
Level of Service		D	D		D	D	D	F	D		C	A
Approach Delay (s)		50.0			43.1			83.2				14.6
Approach LOS		D			D			F				B
Intersection Summary												
HCM Average Control Delay			50.1				HCM Level of Service			D		
HCM Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			81.5%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Movement	SBR
Lane Configurations	
Volume (vph)	4
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.87
Adj. Flow (vph)	5
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	9
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

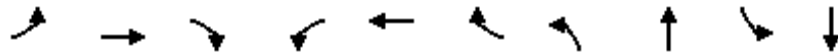
2020 Vol+ExiConfig+OptimizTimings PM_Scenario 4

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	218	116	50	165	130	459	37	647	190	496	373	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-2%			0%			0%	
Total Lost time (s)	5.7	5.7		3.1	5.7	3.1	6.0	3.0	3.0	3.4	3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.91	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1662	1649		1745	1595	1483	1728	3455	1514	3319	1801	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1662	1649		1745	1595	1483	1728	3455	1514	3319	1801	
Peak-hour factor, PHF	0.95	0.95	0.95	0.94	0.94	0.94	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	229	122	53	176	138	488	41	719	211	551	414	0
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	151	0	0	0
Lane Group Flow (vph)	229	163	0	176	323	303	41	719	60	551	414	0
Confl. Peds. (#/hr)			12						8			2
Heavy Vehicles (%)	5%	5%	5%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	19.1	30.3		16.2	27.4	27.4	3.8	30.2	30.2	16.4	42.8	
Effective Green, g (s)	19.1	30.3		18.8	27.4	30.0	3.8	33.2	33.2	19.0	45.8	
Actuated g/C Ratio	0.16	0.26		0.16	0.24	0.26	0.03	0.28	0.28	0.16	0.39	
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	272	429		282	375	382	56	985	431	541	708	
v/s Ratio Prot	c0.14	c0.10		0.10	0.20		0.02	c0.21		c0.17	0.23	
v/s Ratio Perm						c0.20			0.04			
v/c Ratio	0.84	0.38		0.62	0.86	0.79	0.73	0.73	0.14	1.02	0.58	
Uniform Delay, d1	47.2	35.4		45.6	42.7	40.4	55.8	37.6	31.0	48.8	27.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	19.7	0.2		3.1	17.4	10.1	34.2	2.3	0.1	43.4	0.8	
Delay (s)	66.9	35.6		48.6	60.2	50.5	90.1	39.9	31.1	92.2	28.7	
Level of Service	E	D		D	E	D	F	D	C	F	C	
Approach Delay (s)		53.3			54.0			40.1			64.9	
Approach LOS		D			D			D			E	
Intersection Summary												
HCM Average Control Delay			53.0			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			116.5			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			78.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Queues
619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+Exi Timings AM_Scenario 1



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	114	169	407	397	200	182	235	704	111	867
v/c Ratio	0.59	0.67	0.76	0.86	0.37	0.25	0.74	0.55	0.58	0.82
Control Delay	82.1	78.7	48.6	74.2	49.3	6.0	76.2	38.5	81.9	57.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.1	78.7	48.6	74.2	49.3	6.0	76.2	38.5	81.9	57.4
Queue Length 50th (ft)	113	167	310	394	163	6	229	284	110	430
Queue Length 95th (ft)	157	213	329	#499	225	19	326	341	176	486
Internal Link Dist (ft)		1400			557			590		212
Turn Bay Length (ft)	200		200	200		200	200		200	
Base Capacity (vph)	297	549	611	462	723	891	411	1776	411	1810
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.31	0.67	0.86	0.28	0.20	0.57	0.40	0.27	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+Exi Timings AM_Scenario 1



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	19	29	282	196	50	1051	57	756
v/c Ratio	0.05	0.07	0.53	0.26	0.14	0.74	0.23	0.55
Control Delay	20.5	8.4	27.6	4.3	10.4	25.6	12.2	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	8.4	27.6	4.3	10.4	25.6	12.2	21.5
Queue Length 50th (ft)	7	0	128	0	13	266	15	172
Queue Length 95th (ft)	20	14	239	46	22	238	32	228
Internal Link Dist (ft)	203		121			879		601
Turn Bay Length (ft)		25			100		100	
Base Capacity (vph)	1249	1274	534	745	490	2203	646	2692
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	0.02	0.02	0.53	0.26	0.10	0.48	0.09	0.28
Intersection Summary								

Queues
650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+Exi Timings AM_Scenario 1



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	155	100	144	1200	1193
v/c Ratio	0.59	0.32	0.55	0.45	0.58
Control Delay	51.7	10.2	50.0	4.8	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	51.7	10.2	50.0	4.8	16.0
Queue Length 50th (ft)	103	0	95	116	250
Queue Length 95th (ft)	111	15	112	127	348
Internal Link Dist (ft)	1577			559	368
Turn Bay Length (ft)		100	150		
Base Capacity (vph)	467	484	314	2655	2056
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.33	0.21	0.46	0.45	0.58
Intersection Summary					

Queues
651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+Exi Timings AM_Scenario 1

									
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	7	5	174	326	4	963	91	136	1305
v/c Ratio	0.05	0.04	0.62	0.63	0.03	0.51	0.27	0.55	0.55
Control Delay	48.0	29.0	52.0	10.0	47.7	18.9	9.6	51.3	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	29.0	52.0	10.0	47.7	18.9	9.6	51.3	11.8
Queue Length 50th (ft)	5	0	116	0	3	183	0	90	148
Queue Length 95th (ft)	9	4	161	53	11	300	26	128	393
Internal Link Dist (ft)	176		180			717			443
Turn Bay Length (ft)		80			180		320	125	
Base Capacity (vph)	476	423	400	602	137	1891	433	263	2375
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.01	0.43	0.54	0.03	0.51	0.21	0.52	0.55
Intersection Summary									

Queues

653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+ExiConfig+Exi Timings AM_Scenario 1

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	83	175	162	268	254	27	308	75	348	771	31
v/c Ratio	0.54	0.59	0.59	0.80	0.73	0.28	0.27	0.14	0.61	0.90	0.05
Control Delay	65.4	49.6	54.8	60.8	52.8	63.8	30.2	8.4	49.4	44.6	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.4	49.6	54.8	60.8	52.8	63.8	30.2	8.4	49.4	44.6	20.8
Queue Length 50th (ft)	60	114	113	201	185	20	83	0	125	539	11
Queue Length 95th (ft)	91	140	207	325	304	55	155	37	195	#1028	37
Internal Link Dist (ft)		264		438			338			243	
Turn Bay Length (ft)	100		300			125					100
Base Capacity (vph)	308	500	574	647	644	454	1754	802	825	860	670
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.35	0.28	0.41	0.39	0.06	0.18	0.09	0.42	0.90	0.05

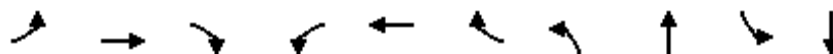
Intersection Summary

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

Queue shown is maximum after two cycles.

Queues
619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+Exi Timings PM_Scenario 2



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	92	225	316	180	123	159	239	681	179	580
v/c Ratio	0.43	0.61	0.40	0.58	0.26	0.20	0.58	0.63	0.58	0.64
Control Delay	58.1	51.6	8.8	53.6	37.6	3.4	48.3	36.3	53.4	41.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.1	51.6	8.8	53.6	37.6	3.4	48.3	36.3	53.4	41.3
Queue Length 50th (ft)	61	146	39	117	69	0	147	204	117	190
Queue Length 95th (ft)	144	290	132	246	153	38	321	374	243	321
Internal Link Dist (ft)		1400			557			590		212
Turn Bay Length (ft)	200		200	200		200	200		200	
Base Capacity (vph)	610	822	886	604	813	977	522	2535	517	2568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.27	0.36	0.30	0.15	0.16	0.46	0.27	0.35	0.23
Intersection Summary										

Queues
616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+Exi Timings PM_Scenario 2



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	21	190	118	46	1186	161	915
v/c Ratio	0.26	0.06	0.72	0.27	0.10	0.63	0.44	0.43
Control Delay	33.9	13.9	52.4	7.5	6.2	18.6	9.2	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.9	13.9	52.4	7.5	6.2	18.6	9.2	12.0
Queue Length 50th (ft)	39	1	110	0	7	253	28	155
Queue Length 95th (ft)	73	17	183	34	23	444	67	258
Internal Link Dist (ft)	203		121			879		601
Turn Bay Length (ft)		25			100		100	
Base Capacity (vph)	969	1133	410	622	601	1927	669	2457
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	0.08	0.02	0.46	0.19	0.08	0.62	0.24	0.37
Intersection Summary								

Queues
650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+Exi Timings PM_Scenario 2



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT
Lane Group Flow (vph)	70	177	122	1253	2	1185
v/c Ratio	0.39	0.56	0.50	0.44	0.02	0.51
Control Delay	51.4	13.7	49.9	4.1	47.5	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.4	13.7	49.9	4.1	47.5	10.8
Queue Length 50th (ft)	47	0	81	82	1	196
Queue Length 95th (ft)	90	62	133	234	9	315
Internal Link Dist (ft)	1577			559		368
Turn Bay Length (ft)		100	150		150	
Base Capacity (vph)	444	524	280	2838	189	2316
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.34	0.44	0.44	0.01	0.51
Intersection Summary						

Queues
651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+Exi Timings PM_Scenario 2



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	19	28	161	233	10	1282	196	334	1155
v/c Ratio	0.13	0.19	0.60	0.54	0.08	1.07	0.50	0.56	0.49
Control Delay	48.5	19.5	51.9	9.9	48.1	81.6	12.7	34.6	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	19.5	51.9	9.9	48.1	81.6	12.7	34.6	11.6
Queue Length 50th (ft)	13	0	107	0	7	~533	14	199	187
Queue Length 95th (ft)	27	16	148	45	24	#787	75	280	377
Internal Link Dist (ft)	176		180			717			443
Turn Bay Length (ft)		80			180		320	125	
Base Capacity (vph)	481	440	411	536	157	1201	506	600	2380
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.06	0.39	0.43	0.06	1.07	0.39	0.56	0.49

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.

Queues
653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+Exi Timings PM_Scenario 2

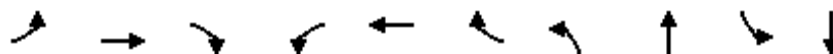
											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	85	99	106	303	287	28	816	183	490	414	29
v/c Ratio	0.56	0.26	0.49	0.81	0.75	0.29	0.75	0.32	0.71	0.47	0.04
Control Delay	73.7	42.6	63.4	64.8	57.6	72.2	44.3	10.2	55.1	26.6	18.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.7	42.6	63.4	64.8	57.6	72.2	44.3	10.2	55.1	26.6	18.2
Queue Length 50th (ft)	68	64	82	247	228	23	316	19	191	235	9
Queue Length 95th (ft)	143	134	165	426	398	64	455	83	#331	411	33
Internal Link Dist (ft)		264		438			338			243	
Turn Bay Length (ft)	100		300			125					100
Base Capacity (vph)	278	481	549	618	615	434	1676	809	766	900	711
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.21	0.19	0.49	0.47	0.06	0.49	0.23	0.64	0.46	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+OptimzTimings AM_Scenario 2



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	114	169	407	397	200	182	235	704	111	867
v/c Ratio	0.52	0.57	0.79	0.92	0.35	0.25	0.91	0.64	0.63	0.91
Control Delay	43.8	40.7	32.6	60.2	25.9	3.4	75.6	27.1	55.4	45.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	40.7	32.6	60.2	25.9	3.4	75.6	27.1	55.4	45.7
Queue Length 50th (ft)	57	84	158	208	86	0	126	162	58	234
Queue Length 95th (ft)	86	109	173	#268	111	15	#225	200	#108	#298
Internal Link Dist (ft)		1400			557			590		212
Turn Bay Length (ft)	200		200	200		200	200		200	
Base Capacity (vph)	256	394	517	433	608	737	258	1106	179	949
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.43	0.79	0.92	0.33	0.25	0.91	0.64	0.62	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+OptimzTimings AM_Scenario 2



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	19	29	282	196	50	1051	57	756
v/c Ratio	0.05	0.08	0.63	0.30	0.11	0.66	0.18	0.48
Control Delay	13.8	7.0	24.4	4.2	5.5	14.7	6.6	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.8	7.0	24.4	4.2	5.5	14.7	6.6	12.4
Queue Length 50th (ft)	5	0	88	0	6	154	8	99
Queue Length 95th (ft)	14	11	#172	37	13	147	19	142
Internal Link Dist (ft)	203		121			879		601
Turn Bay Length (ft)		25			100		100	
Base Capacity (vph)	1287	1300	459	668	440	1595	312	1562
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	0.01	0.02	0.61	0.29	0.11	0.66	0.18	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+OptimzTimings AM_Scenario 2



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	155	100	144	1200	1193
v/c Ratio	0.59	0.32	0.55	0.45	0.58
Control Delay	51.8	10.2	50.1	4.7	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	51.8	10.2	50.1	4.7	15.9
Queue Length 50th (ft)	103	0	95	115	248
Queue Length 95th (ft)	111	15	112	127	347
Internal Link Dist (ft)	1577			559	368
Turn Bay Length (ft)		100	150		
Base Capacity (vph)	414	440	303	2656	2058
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.37	0.23	0.48	0.45	0.58
Intersection Summary					

Queues
651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+OptimzTimings AM_Scenario 2



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	7	5	174	326	4	963	91	136	1305
v/c Ratio	0.05	0.04	0.63	0.63	0.03	0.53	0.27	0.48	0.55
Control Delay	48.0	29.0	52.1	10.0	47.7	20.2	9.6	46.8	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	29.0	52.1	10.0	47.7	20.2	9.6	46.8	11.8
Queue Length 50th (ft)	5	0	116	0	3	195	0	88	147
Queue Length 95th (ft)	9	4	161	53	11	299	26	128	393
Internal Link Dist (ft)	176		180			717			443
Turn Bay Length (ft)		80			180		320	125	
Base Capacity (vph)	476	423	390	595	125	1815	424	286	2376
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.01	0.45	0.55	0.03	0.53	0.21	0.48	0.55
Intersection Summary									

Queues
653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+OptimzTimings AM_Scenario 2

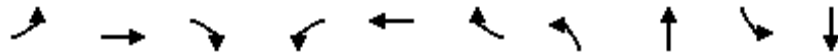
											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	83	175	162	268	254	27	308	75	348	771	31
v/c Ratio	0.57	0.61	0.61	0.74	0.68	0.36	0.25	0.13	0.66	0.85	0.04
Control Delay	68.7	50.7	56.1	54.9	49.2	72.6	27.8	7.5	52.8	37.9	17.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.7	50.7	56.1	54.9	49.2	72.6	27.8	7.5	52.8	37.9	17.7
Queue Length 50th (ft)	62	114	116	205	189	20	83	0	128	523	9
Queue Length 95th (ft)	90	137	202	317	297	#56	143	35	200	#952	33
Internal Link Dist (ft)		264		438			338			243	
Turn Bay Length (ft)	100		300			125					100
Base Capacity (vph)	211	497	433	603	602	75	1290	611	640	910	715
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.35	0.37	0.44	0.42	0.36	0.24	0.12	0.54	0.85	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+OptimizTimings PM_Scenario 2



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	92	225	316	180	123	159	239	681	179	580
v/c Ratio	0.46	0.54	0.50	0.65	0.26	0.23	1.04	0.70	0.79	0.60
Control Delay	36.1	26.4	11.4	39.6	19.2	3.5	105.2	23.0	56.3	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	26.4	11.4	39.6	19.2	3.5	105.2	23.0	56.3	22.1
Queue Length 50th (ft)	33	76	50	65	36	3	~104	108	67	94
Queue Length 95th (ft)	#87	136	108	#165	75	30	#258	182	#188	159
Internal Link Dist (ft)		1400			557			590		212
Turn Bay Length (ft)	200		200	200		200	200		200	
Base Capacity (vph)	202	608	631	286	692	705	229	1134	226	1125
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.37	0.50	0.63	0.18	0.23	1.04	0.60	0.79	0.52

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.

Queues
616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+OptimizTimings PM_Scenario 2



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	21	190	118	46	1186	161	915
v/c Ratio	0.24	0.06	0.65	0.26	0.10	0.72	0.47	0.48
Control Delay	20.1	9.2	32.5	5.9	4.2	15.5	11.2	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	9.2	32.5	5.9	4.2	15.5	11.2	10.5
Queue Length 50th (ft)	22	0	64	0	4	160	17	109
Queue Length 95th (ft)	44	12	111	26	15	264	64	187
Internal Link Dist (ft)	203		121			879		601
Turn Bay Length (ft)		25			100		100	
Base Capacity (vph)	978	1051	293	460	496	1646	348	1909
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	0.08	0.02	0.65	0.26	0.09	0.72	0.46	0.48
Intersection Summary								

Queues
650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+OptimizTimings PM_Scenario 2



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT
Lane Group Flow (vph)	70	177	122	1253	2	1185
v/c Ratio	0.39	0.56	0.50	0.44	0.02	0.51
Control Delay	51.4	13.7	49.9	4.1	47.5	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.4	13.7	49.9	4.1	47.5	10.8
Queue Length 50th (ft)	47	0	81	82	1	196
Queue Length 95th (ft)	90	62	133	234	9	315
Internal Link Dist (ft)	1577			559		368
Turn Bay Length (ft)		100	150		150	
Base Capacity (vph)	431	514	280	2838	127	2316
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.34	0.44	0.44	0.02	0.51
Intersection Summary						

Queues
651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+OptimizTimings PM_Scenario 2



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	19	28	161	233	10	1282	196	334	1155
v/c Ratio	0.13	0.19	0.60	0.54	0.08	1.07	0.50	0.56	0.49
Control Delay	48.5	19.5	51.9	9.9	48.1	81.6	12.7	34.6	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	19.5	51.9	9.9	48.1	81.6	12.7	34.6	11.6
Queue Length 50th (ft)	13	0	107	0	7	~533	14	199	187
Queue Length 95th (ft)	27	16	148	45	24	#787	75	280	377
Internal Link Dist (ft)	176		180			717			443
Turn Bay Length (ft)		80			180		320	125	
Base Capacity (vph)	481	440	411	536	157	1201	506	600	2380
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.06	0.39	0.43	0.06	1.07	0.39	0.56	0.49

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.

Queues
653: Issaquah-Pine Lk Rd & 228th Ave SE

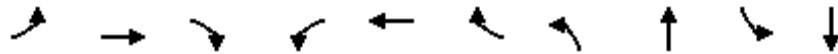
Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+ExiConfig+OptimizTimings PM_Scenario 2

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	85	99	106	303	287	28	816	183	490	414	29
v/c Ratio	0.57	0.25	0.49	0.79	0.73	0.33	0.76	0.32	0.71	0.46	0.04
Control Delay	79.2	43.4	67.0	63.3	57.1	80.4	47.0	11.8	56.4	26.6	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.2	43.4	67.0	63.3	57.1	80.4	47.0	11.8	56.4	26.6	16.4
Queue Length 50th (ft)	69	64	83	248	229	23	318	22	194	238	8
Queue Length 95th (ft)	157	139	180	443	414	69	512	96	336	428	32
Internal Link Dist (ft)		264		438			338			243	
Turn Bay Length (ft)	100		300			125					100
Base Capacity (vph)	230	559	417	628	624	100	1543	754	922	1162	927
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.18	0.25	0.48	0.46	0.28	0.53	0.24	0.53	0.36	0.03
Intersection Summary											

Queues
619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings AM_Scenario 3



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	149	176	267	785	189	155	170	1080	157	947
v/c Ratio	0.68	0.68	0.59	1.81	0.39	0.23	0.69	0.87	0.67	0.76
Control Delay	88.8	83.8	48.1	405.4	56.6	13.9	84.7	55.9	85.4	50.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.8	83.8	48.1	405.4	56.6	13.9	84.7	55.9	85.4	50.2
Queue Length 50th (ft)	156	183	212	~1286	170	37	177	557	164	467
Queue Length 95th (ft)	214	239	246	#1451	235	60	264	628	250	539
Internal Link Dist (ft)		1400			557			590		212
Turn Bay Length (ft)	200		200	200		200	200		200	
Base Capacity (vph)	279	516	576	434	680	796	387	1637	387	1701
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.34	0.46	1.81	0.28	0.19	0.44	0.66	0.41	0.56

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.

Queues
616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+ExiConfig+Exi Timings AM_Scenario 3



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	39	248	290	202	81	989	19	747
v/c Ratio	0.06	0.31	0.50	0.25	0.23	0.68	0.08	0.66
Control Delay	16.4	3.9	22.9	4.0	12.2	22.0	11.2	26.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	3.9	22.9	4.0	12.2	22.0	11.2	26.1
Queue Length 50th (ft)	11	0	104	1	21	183	5	175
Queue Length 95th (ft)	29	22	224	45	33	217	15	236
Internal Link Dist (ft)	203		121			879		601
Turn Bay Length (ft)		25			100		100	
Base Capacity (vph)	1214	1400	575	800	474	2412	698	2869
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	0.03	0.18	0.50	0.25	0.17	0.41	0.03	0.26
Intersection Summary								

Queues
650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+ExiConfig+Exi Timings AM_Scenario 3



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	103	145	227	1143	980
v/c Ratio	0.49	0.46	0.65	0.41	0.49
Control Delay	51.8	11.8	48.5	3.4	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	51.8	11.8	48.5	3.4	15.6
Queue Length 50th (ft)	69	0	148	86	198
Queue Length 95th (ft)	83	14	157	96	277
Internal Link Dist (ft)	1577			559	368
Turn Bay Length (ft)		100	150		
Base Capacity (vph)	467	517	360	2756	1985
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.22	0.28	0.63	0.41	0.49
Intersection Summary					

Queues
651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings AM_Scenario 3

	→	↘	←	↖	↙	↑	↗	↘	↓
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	2	152	350	3	936	108	142	1086
v/c Ratio	0.04	0.02	0.59	0.67	0.02	0.47	0.33	0.56	0.44
Control Delay	48.0	33.0	51.7	10.9	47.5	16.1	9.8	51.3	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	33.0	51.7	10.9	47.5	16.1	9.8	51.3	8.5
Queue Length 50th (ft)	3	0	102	0	2	171	0	94	102
Queue Length 95th (ft)	7	3	146	55	9	281	28	132	290
Internal Link Dist (ft)	176		180			717			443
Turn Bay Length (ft)		80			180		320	125	
Base Capacity (vph)	476	421	400	620	137	1990	446	267	2486
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.00	0.38	0.56	0.02	0.47	0.24	0.53	0.44
Intersection Summary									

Queues
653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings AM_Scenario 3



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	224	374	268	287	267	41	272	86	392	771
v/c Ratio	0.91	0.94	0.78	0.68	0.64	0.43	0.30	0.19	0.72	1.12
Control Delay	97.2	80.9	68.0	54.1	50.5	79.2	41.6	9.2	63.2	113.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.2	80.9	68.0	54.1	50.5	79.2	41.6	9.2	63.2	113.4
Queue Length 50th (ft)	205	318	233	247	223	37	102	0	176	~826
Queue Length 95th (ft)	#240	323	345	368	337	80	155	42	244	#1186
Internal Link Dist (ft)		264		438			338			243
Turn Bay Length (ft)	100		300			125				
Base Capacity (vph)	246	398	458	523	513	362	1399	661	658	686
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.94	0.59	0.55	0.52	0.11	0.19	0.13	0.60	1.12

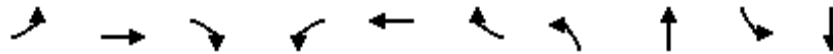
Intersection Summary

- ~ 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.

Queues
619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings PM_Scenario 3



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	234	207	356	117	136	172	1113	253	634
v/c Ratio	0.64	0.76	0.37	0.97	0.24	0.17	0.73	0.90	0.82	0.45
Control Delay	93.4	87.3	18.5	107.1	55.0	5.1	93.4	60.0	92.6	39.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.4	87.3	18.5	107.1	55.0	5.1	93.4	60.0	92.6	39.4
Queue Length 50th (ft)	135	261	64	414	106	0	193	610	285	275
Queue Length 95th (ft)	230	396	141	#782	196	47	318	775	#538	391
Internal Link Dist (ft)		1400			557			590		212
Turn Bay Length (ft)	200		200	200		200	200		200	
Base Capacity (vph)	372	501	628	368	506	805	318	1566	315	1597
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.47	0.33	0.97	0.23	0.17	0.54	0.71	0.80	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+ExiConfig+Exi Timings PM_Scenario 3



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	150	173	196	122	209	1125	54	915
v/c Ratio	0.41	0.33	0.63	0.22	0.46	0.64	0.18	0.65
Control Delay	28.6	15.6	37.5	5.6	10.9	18.1	9.3	23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.6	15.6	37.5	5.6	10.9	18.1	9.3	23.5
Queue Length 50th (ft)	67	39	96	0	42	224	10	199
Queue Length 95th (ft)	110	75	162	30	91	362	29	327
Internal Link Dist (ft)	203		121			879		601
Turn Bay Length (ft)		25			100		100	
Base Capacity (vph)	970	1312	421	718	519	2273	748	2791
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	0.15	0.13	0.47	0.17	0.40	0.49	0.07	0.33
Intersection Summary								

Queues
650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+ExiConfig+Exi Timings PM_Scenario 3



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT
Lane Group Flow (vph)	46	256	193	1195	1	980
v/c Ratio	0.26	0.68	0.61	0.42	0.01	0.45
Control Delay	47.6	16.0	48.9	4.0	48.0	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.6	16.0	48.9	4.0	48.0	12.3
Queue Length 50th (ft)	31	6	126	66	1	164
Queue Length 95th (ft)	63	80	191	237	6	290
Internal Link Dist (ft)	1577			559		368
Turn Bay Length (ft)		100	150		150	
Base Capacity (vph)	444	576	327	2847	189	2176
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.44	0.59	0.42	0.01	0.45
Intersection Summary						

Queues
651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings PM_Scenario 3

									
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	12	7	131	250	8	1245	234	354	956
v/c Ratio	0.09	0.06	0.54	0.59	0.06	0.99	0.57	0.55	0.38
Control Delay	48.2	27.0	51.6	11.0	48.0	59.2	13.3	33.2	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.2	27.0	51.6	11.0	48.0	59.2	13.3	33.2	8.5
Queue Length 50th (ft)	8	0	88	0	5	388	13	209	77
Queue Length 95th (ft)	20	9	127	47	21	#726	81	296	272
Internal Link Dist (ft)	176		180			717			443
Turn Bay Length (ft)		80			180		320	125	
Base Capacity (vph)	483	425	410	549	157	1255	537	641	2520
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.02	0.32	0.46	0.05	0.99	0.44	0.55	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+Exi Timings PM_Scenario 3



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	229	175	176	323	303	41	719	211	551	414
v/c Ratio	0.91	0.42	0.64	0.87	0.81	0.41	0.77	0.38	0.79	0.55
Control Delay	94.6	45.3	65.3	72.5	64.4	76.4	51.5	8.5	61.2	34.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.6	45.3	65.3	72.5	64.4	76.4	51.5	8.5	61.2	34.8
Queue Length 50th (ft)	201	121	146	286	262	35	304	9	239	278
Queue Length 95th (ft)	#421	222	240	440	411	81	404	73	#383	435
Internal Link Dist (ft)		264		438			338			243
Turn Bay Length (ft)	100		300			125				
Base Capacity (vph)	252	427	497	568	557	393	1519	773	694	766
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.41	0.35	0.57	0.54	0.10	0.47	0.27	0.79	0.54

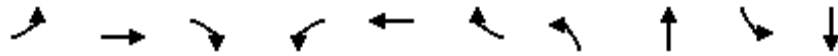
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+OptimzTimings AM_Scenario 4



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	149	176	267	785	189	155	170	1080	157	947
v/c Ratio	0.70	0.78	0.72	1.14	0.26	0.20	1.07	1.08	1.29	1.00
Control Delay	74.9	82.2	50.1	116.9	28.9	6.1	149.4	96.9	225.5	79.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.9	82.2	50.1	116.9	28.9	6.1	149.4	96.9	225.5	79.0
Queue Length 50th (ft)	131	156	175	~838	113	15	~173	~570	~182	~463
Queue Length 95th (ft)	154	181	190	#721	135	30	#267	#560	#277	#478
Internal Link Dist (ft)		1400			557			590		212
Turn Bay Length (ft)	200		200	200		200	200		200	
Base Capacity (vph)	254	242	369	690	726	778	159	999	122	945
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.73	0.72	1.14	0.26	0.20	1.07	1.08	1.29	1.00

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.

Queues
616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+ExiConfig+OptimzTimings AM_Scenario 4



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	39	248	290	202	81	989	19	747
v/c Ratio	0.07	0.37	0.60	0.29	0.19	0.60	0.06	0.57
Control Delay	12.1	6.4	21.4	3.8	6.9	12.4	6.1	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	6.4	21.4	3.8	6.9	12.4	6.1	15.1
Queue Length 50th (ft)	7	13	71	0	11	105	3	100
Queue Length 95th (ft)	22	40	#172	37	20	142	9	144
Internal Link Dist (ft)	203		121			879		601
Turn Bay Length (ft)		25			100		100	
Base Capacity (vph)	1253	1416	493	716	417	1654	339	1550
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	0.03	0.18	0.59	0.28	0.19	0.60	0.06	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+ExiConfig+OptimzTimings AM_Scenario 4



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	103	145	227	1143	980
v/c Ratio	0.49	0.46	0.66	0.41	0.49
Control Delay	51.9	11.9	49.1	3.4	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	11.9	49.1	3.4	15.3
Queue Length 50th (ft)	69	0	147	86	199
Queue Length 95th (ft)	83	14	160	96	267
Internal Link Dist (ft)	1577			559	368
Turn Bay Length (ft)		100	150		
Base Capacity (vph)	414	475	353	2757	1992
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.25	0.31	0.64	0.41	0.49
Intersection Summary					

Queues
651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+ExiConfig+OptimzTimings AM_Scenario 4

									
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	2	152	350	3	936	108	142	1086
v/c Ratio	0.04	0.02	0.59	0.67	0.02	0.47	0.33	0.56	0.44
Control Delay	48.0	33.0	51.7	10.9	47.5	16.1	9.8	51.3	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	33.0	51.7	10.9	47.5	16.1	9.8	51.3	8.5
Queue Length 50th (ft)	3	0	102	0	2	171	0	94	102
Queue Length 95th (ft)	7	3	146	55	9	281	28	132	290
Internal Link Dist (ft)	176		180			717			443
Turn Bay Length (ft)		80			180		320	125	
Base Capacity (vph)	476	421	400	620	137	1990	446	267	2486
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.00	0.38	0.56	0.02	0.47	0.24	0.53	0.44
Intersection Summary									

Queues
653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+OptimzTimings AM_Scenario 4



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	224	374	268	287	267	41	272	86	392	771
v/c Ratio	0.86	0.95	0.83	0.76	0.71	0.66	0.28	0.17	0.73	1.02
Control Delay	85.4	80.5	74.2	62.2	57.1	109.7	38.1	8.3	62.7	78.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.4	80.5	74.2	62.2	57.1	109.7	38.1	8.3	62.7	78.0
Queue Length 50th (ft)	198	309	234	257	232	38	101	0	176	~782
Queue Length 95th (ft)	205	284	#369	#393	346	#101	140	39	229	#1013
Internal Link Dist (ft)		264		438			338			243
Turn Bay Length (ft)	100		300			125				
Base Capacity (vph)	297	416	359	397	397	62	1003	499	604	753
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.90	0.75	0.72	0.67	0.66	0.27	0.17	0.65	1.02

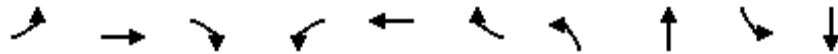
Intersection Summary

- ~ 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.

Queues
619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+OptimizTimings PM_Scenario 4



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	234	207	356	117	136	172	1113	253	634
v/c Ratio	0.56	0.68	0.36	1.00	0.27	0.20	0.65	0.99	0.99	0.59
Control Delay	46.9	44.0	12.5	84.7	27.7	3.4	47.1	51.6	95.1	28.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	44.0	12.5	84.7	27.7	3.4	47.1	51.6	95.1	28.3
Queue Length 50th (ft)	63	121	44	~204	51	0	90	294	~145	158
Queue Length 95th (ft)	118	195	92	#387	96	30	158	#455	#302	221
Internal Link Dist (ft)		1400			557			590		212
Turn Bay Length (ft)	200		200	200		200	200		200	
Base Capacity (vph)	240	400	608	357	521	689	297	1128	255	1075
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.58	0.34	1.00	0.22	0.20	0.58	0.99	0.99	0.59

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.

Queues
616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+ExiConfig+OptimizTimings PM_Scenario 4



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	150	173	196	122	209	1125	54	915
v/c Ratio	0.29	0.26	0.43	0.17	0.62	0.77	0.19	0.80
Control Delay	15.2	8.9	18.6	3.3	24.7	27.1	14.4	30.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	8.9	18.6	3.3	24.7	27.1	14.4	30.5
Queue Length 50th (ft)	46	28	66	0	52	255	12	200
Queue Length 95th (ft)	71	51	104	21	#170	#477	38	#361
Internal Link Dist (ft)	203		121			879		601
Turn Bay Length (ft)		25			100		100	
Base Capacity (vph)	780	962	455	701	338	1459	295	1325
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	0.19	0.18	0.43	0.17	0.62	0.77	0.18	0.69

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+ExiConfig+OptimizTimings PM_Scenario 4



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT
Lane Group Flow (vph)	46	256	193	1195	1	980
v/c Ratio	0.27	0.67	0.61	0.42	0.01	0.45
Control Delay	48.3	14.6	49.3	3.9	48.0	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	14.6	49.3	3.9	48.0	12.0
Queue Length 50th (ft)	31	0	127	66	1	163
Queue Length 95th (ft)	63	74	190	231	6	287
Internal Link Dist (ft)	1577			559		368
Turn Bay Length (ft)		100	150		150	
Base Capacity (vph)	431	573	384	2856	126	2190
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.45	0.50	0.42	0.01	0.45
Intersection Summary						

Queues
651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+OptimizTimings PM_Scenario 4



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	12	7	131	250	8	1245	234	354	956
v/c Ratio	0.09	0.06	0.54	0.59	0.06	0.99	0.57	0.55	0.38
Control Delay	48.2	27.0	51.6	11.0	48.0	59.2	13.3	33.2	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.2	27.0	51.6	11.0	48.0	59.2	13.3	33.2	8.5
Queue Length 50th (ft)	8	0	88	0	5	388	13	209	77
Queue Length 95th (ft)	20	9	127	47	21	#726	81	296	272
Internal Link Dist (ft)	176		180			717			443
Turn Bay Length (ft)		80			180		320	125	
Base Capacity (vph)	483	425	410	549	157	1255	537	641	2520
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.02	0.32	0.46	0.05	0.99	0.44	0.55	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+ExiConfig+OptimizTimings PM_Scenario 4



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	229	175	176	323	303	41	719	211	551	414
v/c Ratio	0.82	0.39	0.61	0.85	0.78	0.42	0.78	0.38	0.99	0.57
Control Delay	71.4	35.4	55.6	62.9	54.7	71.1	46.6	6.9	86.2	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.4	35.4	55.6	62.9	54.7	71.1	46.6	6.9	86.2	34.3
Queue Length 50th (ft)	171	98	129	252	230	31	270	0	~246	271
Queue Length 95th (ft)	#314	181	209	383	354	74	367	60	#398	415
Internal Link Dist (ft)		264		438			338			243
Turn Bay Length (ft)	100		300			125				
Base Capacity (vph)	337	511	448	507	506	108	1105	627	554	737
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.34	0.39	0.64	0.60	0.38	0.65	0.34	0.99	0.56

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.

APPENDIX C – 2011 AND 2020 INTERSECTION LOS AND QUEUE CALCULATIONS WITH IMPROVEMENTS

HCM Signalized Intersection Capacity Analysis

870: Sahalee Way NE & 223rd AVE NE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimzTimings AM_Scenario 5

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	309	26	4	900	0	78	1	11	5	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.98			0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1711	1776		1743	1837			1727			1686	
Flt Permitted	0.14	1.00		0.52	1.00			0.74			0.92	
Satd. Flow (perm)	250	1776		951	1837			1327			1576	
Peak-hour factor, PHF	0.88	0.88	0.88	0.94	0.94	0.94	0.73	0.73	0.73	0.83	0.83	0.83
Adj. Flow (vph)	6	351	30	4	957	0	107	1	15	6	0	18
RTOR Reduction (vph)	0	5	0	0	0	0	0	9	0	0	14	0
Lane Group Flow (vph)	6	376	0	4	957	0	0	114	0	0	10	0
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	29.7	29.7		29.7	29.7			9.6			9.6	
Effective Green, g (s)	30.7	30.7		30.7	30.7			10.6			10.6	
Actuated g/C Ratio	0.62	0.62		0.62	0.62			0.22			0.22	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	156	1106		592	1144			285			339	
v/s Ratio Prot		0.21			c0.52							
v/s Ratio Perm	0.02			0.00				c0.09			0.01	
v/c Ratio	0.04	0.34		0.01	0.84			0.40			0.03	
Uniform Delay, d1	3.6	4.5		3.5	7.3			16.6			15.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	0.2		0.0	5.5			0.9			0.0	
Delay (s)	3.7	4.6		3.5	12.8			17.5			15.3	
Level of Service	A	A		A	B			B			B	
Approach Delay (s)		4.6			12.7			17.5			15.3	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM Average Control Delay			11.1			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			49.3			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			65.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimzTimings AM_Scenario 5

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	118	285	282	142	129	186	475	81	88	642	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			0%			2%	
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1678	1766	1485	1678	1766	1485	1694	3296		1694	3351	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1678	1766	1485	1678	1766	1485	1694	3296		1694	3351	
Peak-hour factor, PHF	0.70	0.70	0.70	0.71	0.71	0.71	0.79	0.79	0.79	0.79	0.79	0.79
Adj. Flow (vph)	114	169	407	397	200	182	235	601	103	111	813	54
RTOR Reduction (vph)	0	0	42	0	0	107	0	15	0	0	5	0
Lane Group Flow (vph)	114	169	365	397	200	75	235	689	0	111	862	0
Confl. Peds. (#/hr)			5			2			7			1
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot			Prot		
Protected Phases	3	8	5	7	4	1	5	2		1	6	
Permitted Phases			8			4						
Actuated Green, G (s)	7.9	13.3	24.3	20.0	25.0	31.8	11.0	26.0		6.8	21.8	
Effective Green, g (s)	9.9	15.3	28.3	22.0	27.4	35.8	13.0	28.3		8.8	24.1	
Actuated g/C Ratio	0.11	0.18	0.33	0.25	0.32	0.41	0.15	0.33		0.10	0.28	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.4	5.0	5.0	5.3		5.0	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	192	313	538	427	560	615	255	1080		173	935	
v/s Ratio Prot	0.07	0.10	c0.10	c0.24	0.11	0.01	c0.14	0.21		0.07	c0.26	
v/s Ratio Perm			0.14			0.04						
v/c Ratio	0.59	0.54	0.68	0.93	0.36	0.12	0.92	0.64		0.64	0.92	
Uniform Delay, d1	36.3	32.3	25.1	31.4	22.7	15.6	36.2	24.7		37.3	30.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.3	0.9	2.7	26.1	0.1	0.0	35.4	0.9		6.0	13.9	
Delay (s)	39.6	33.2	27.8	57.6	22.9	15.6	71.6	25.6		43.2	44.2	
Level of Service	D	C	C	E	C	B	E	C		D	D	
Approach Delay (s)		31.1			38.9			37.1			44.1	
Approach LOS		C			D			D			D	
Intersection Summary												
HCM Average Control Delay	38.3			HCM Level of Service			D					
HCM Volume to Capacity ratio	0.88											
Actuated Cycle Length (s)	86.4			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	65.8%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimzTimings AM_Scenario 5

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	3	22	249	13	182	35	661	75	51	651	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-2%			2%	
Total Lost time (s)		2.0	4.0		3.0	3.0	1.0	3.0		1.5	3.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1767	1541		1735	1546	1711	3361		1661	3303	
Flt Permitted		0.80	1.00		0.72	1.00	0.28	1.00		0.16	1.00	
Satd. Flow (perm)		1471	1541		1313	1546	509	3361		275	3303	
Peak-hour factor, PHF	0.75	0.75	0.75	0.93	0.93	0.93	0.70	0.70	0.70	0.89	0.89	0.89
Adj. Flow (vph)	15	4	29	268	14	196	50	944	107	57	731	25
RTOR Reduction (vph)	0	0	20	0	0	130	0	8	0	0	2	0
Lane Group Flow (vph)	0	19	9	0	282	66	50	1043	0	57	754	0
Confl. Peds. (#/hr)			1	1			2		2	2		2
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	3%	3%	3%	4%	4%	4%
Turn Type	Perm		Perm	Perm		Perm	pm+pt			pm+pt		
Protected Phases		8			4		5	2			1	6
Permitted Phases	8		8	4		4	2			6		
Actuated Green, G (s)		17.8	17.8		17.8	17.8	26.4	24.1		26.4	24.1	
Effective Green, g (s)		20.8	18.8		19.8	19.8	32.4	27.1		31.4	27.1	
Actuated g/C Ratio		0.35	0.32		0.33	0.33	0.55	0.46		0.53	0.46	
Clearance Time (s)		5.0	5.0		5.0	5.0	4.0	6.0		4.0	6.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)		517	489		439	517	386	1539		258	1512	
v/s Ratio Prot							0.01	c0.31		c0.02	0.23	
v/s Ratio Perm		0.01	0.01		c0.21	0.04	0.06			0.10		
v/c Ratio		0.04	0.02		0.64	0.13	0.13	0.68		0.22	0.50	
Uniform Delay, d1		12.6	13.9		16.7	13.7	6.6	12.6		8.0	11.3	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.0		2.4	0.0	0.2	0.9		0.4	0.1	
Delay (s)		12.6	13.9		19.1	13.7	6.7	13.6		8.4	11.4	
Level of Service		B	B		B	B	A	B		A	B	
Approach Delay (s)		13.4			16.9			13.3			11.2	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			13.3				HCM Level of Service			B		
HCM Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			59.2				Sum of lost time (s)			7.5		
Intersection Capacity Utilization			55.2%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimzTimings AM_Scenario 5



Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Volume (vph)	101	65	8	91	828	0	941	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%				0%		-3%	
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.85		1.00	1.00		0.99	
Flt Protected	0.95	1.00		0.95	1.00		1.00	
Satd. Flow (prot)	1711	1506		1678	3355		3383	
Flt Permitted	0.95	1.00		0.95	1.00		1.00	
Satd. Flow (perm)	1711	1506		1678	3355		3383	
Peak-hour factor, PHF	0.65	0.65	0.69	0.69	0.69	0.82	0.82	0.82
Adj. Flow (vph)	155	100	12	132	1200	0	1148	45
RTOR Reduction (vph)	0	85	0	0	0	0	2	0
Lane Group Flow (vph)	155	15	0	144	1200	0	1191	0
Confl. Peds. (#/hr)	2	2						2
Heavy Vehicles (%)	2%	2%	4%	4%	4%	4%	4%	4%
Turn Type		Perm	Prot	Prot		Prot		
Protected Phases	8		5	5	2	1	6	
Permitted Phases	8	8						
Actuated Green, G (s)	14.3	14.3		14.6	84.1		63.9	
Effective Green, g (s)	16.9	16.9		17.2	87.1		66.9	
Actuated g/C Ratio	0.15	0.15		0.16	0.79		0.61	
Clearance Time (s)	5.6	5.6		5.6	6.0		6.0	
Vehicle Extension (s)	2.0	2.0		3.0	3.0		2.0	
Lane Grp Cap (vph)	263	231		262	2657		2057	
v/s Ratio Prot	c0.09			c0.09	0.36		c0.35	
v/s Ratio Perm		0.01						
v/c Ratio	0.59	0.07		0.55	0.45		0.58	
Uniform Delay, d1	43.3	39.8		42.8	3.7		13.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	2.2	0.0		2.4	0.6		1.2	
Delay (s)	45.5	39.8		45.2	4.3		14.2	
Level of Service	D	D		D	A		B	
Approach Delay (s)	43.3				8.7		14.2	
Approach LOS	D				A		B	

Intersection Summary

HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+Improvements+OptimzTimings AM_Scenario 5

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	3	0	2	146	0	274	3	732	69	4	105	1041
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	3.0	3.0	2.3		3.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00	0.99		1.00	0.99	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85		1.00	1.00
Flt Protected		0.95	1.00		0.95	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1745	1539		1694	1493	1678	3355	1501		1678	3354
Flt Permitted		0.95	1.00		0.95	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1745	1539		1694	1493	1678	3355	1501		1678	3354
Peak-hour factor, PHF	0.42	0.42	0.42	0.84	0.84	0.84	0.76	0.76	0.76	0.80	0.80	0.80
Adj. Flow (vph)	7	0	5	174	0	326	4	963	91	5	131	1301
RTOR Reduction (vph)	0	0	5	0	0	272	0	0	75	0	0	0
Lane Group Flow (vph)	0	7	0	0	174	54	4	963	16	0	136	1305
Confl. Peds. (#/hr)			2			1			3			
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Split		Perm	Split		Perm	Prot		Over	Prot	Prot	
Protected Phases	3	3		4	4		5	2	4	1	1	6
Permitted Phases			3			4						
Actuated Green, G (s)		2.3	2.3		15.8	15.8	1.1	52.9	15.8		15.7	67.5
Effective Green, g (s)		5.3	5.3		18.1	18.1	4.1	55.9	18.8		18.7	69.5
Actuated g/C Ratio		0.05	0.05		0.16	0.16	0.04	0.51	0.17		0.17	0.63
Clearance Time (s)		6.0	6.0		5.3	5.3	6.0	6.0	5.3		6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		84	74		279	246	63	1705	257		285	2119
v/s Ratio Prot		c0.00			c0.10		0.00	0.29	0.01		c0.08	c0.39
v/s Ratio Perm			0.00			0.04						
v/c Ratio		0.08	0.00		0.62	0.22	0.06	0.56	0.06		0.48	0.62
Uniform Delay, d1		50.0	49.8		42.8	39.8	51.1	18.7	38.2		41.2	12.2
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2	0.0		3.1	0.2	0.2	1.4	0.0		0.5	1.4
Delay (s)		50.2	49.8		45.9	40.0	51.3	20.0	38.2		41.7	13.6
Level of Service		D	D		D	D	D	C	D		D	B
Approach Delay (s)		50.0			42.0			21.7				16.2
Approach LOS		D			D			C				B
Intersection Summary												
HCM Average Control Delay			22.6			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)			13.0			
Intersection Capacity Utilization			62.1%			ICU Level of Service			B			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimzTimings AM_Scenario 5

Movement	SBR
Lane Configurations	
Volume (vph)	3
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.80
Adj. Flow (vph)	4
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimzTimings AM_Scenario 5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	81	34	146	83	387	24	271	66	310	686	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-2%			0%			0%	
Total Lost time (s)	5.7	5.7		3.1	5.7	3.1	6.0	3.0	3.0	3.4	3.0	6.0
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.90	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1678	1675		1663	1499	1413	1646	3292	1444	3255	1766	1458
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1678	1675		1663	1499	1413	1646	3292	1444	3255	1766	1458
Peak-hour factor, PHF	0.66	0.66	0.66	0.90	0.90	0.90	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	83	123	52	162	92	430	27	308	75	348	771	31
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	46	0	0	4
Lane Group Flow (vph)	83	163	0	162	268	254	27	308	29	348	771	27
Confl. Peds. (#/hr)			3						7			3
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	6%	6%	6%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	8.3	19.9		15.4	27.0	27.0	2.7	42.0	42.0	15.6	54.9	54.9
Effective Green, g (s)	8.3	19.9		18.0	27.0	29.6	2.7	45.0	45.0	18.2	57.9	54.9
Actuated g/C Ratio	0.07	0.17		0.15	0.23	0.25	0.02	0.39	0.39	0.16	0.50	0.47
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	120	287		257	348	360	38	1274	559	509	879	688
v/s Ratio Prot	0.05	0.10		c0.10	0.18		0.02	0.09		c0.11	c0.44	
v/s Ratio Perm						c0.18			0.02			0.02
v/c Ratio	0.69	0.57		0.63	0.77	0.71	0.71	0.24	0.05	0.68	0.88	0.04
Uniform Delay, d1	52.8	44.3		46.0	41.7	39.4	56.4	24.1	22.3	46.3	26.0	16.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.0	1.5		3.7	9.2	5.1	40.7	0.0	0.0	3.0	9.5	0.0
Delay (s)	65.7	45.8		49.7	51.0	44.5	97.2	24.1	22.3	49.4	35.6	16.5
Level of Service	E	D		D	D	D	F	C	C	D	D	B
Approach Delay (s)		52.2			48.3			28.6			39.2	
Approach LOS		D			D			C			D	

Intersection Summary

HCM Average Control Delay	41.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	116.3	Sum of lost time (s)	9.5
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

870: Sahalee Way NE & 223rd AVE NE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+Improvements+OptimizTimings PM_Scenario 5

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	743	75	10	457	16	22	2	13	9	2	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.95			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	
Satd. Flow (prot)	1745	1808		1744	1826			1687			1753	
Flt Permitted	0.42	1.00		0.19	1.00			0.81			0.84	
Satd. Flow (perm)	766	1808		346	1826			1406			1516	
Peak-hour factor, PHF	0.91	0.91	0.91	0.88	0.88	0.88	0.71	0.71	0.71	0.64	0.64	0.64
Adj. Flow (vph)	12	816	82	11	519	18	31	3	18	14	3	11
RTOR Reduction (vph)	0	5	0	0	2	0	0	15	0	0	9	0
Lane Group Flow (vph)	12	893	0	11	535	0	0	37	0	0	19	0
Confl. Peds. (#/hr)			2	2		1			2	2		
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	26.4	26.4		26.4	26.4			6.9			6.9	
Effective Green, g (s)	27.4	27.4		27.4	27.4			7.9			7.9	
Actuated g/C Ratio	0.63	0.63		0.63	0.63			0.18			0.18	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	485	1144		219	1155			257			277	
v/s Ratio Prot		c0.49			0.29							
v/s Ratio Perm	0.02			0.03				c0.03			0.01	
v/c Ratio	0.02	0.78		0.05	0.46			0.15			0.07	
Uniform Delay, d1	3.0	5.8		3.0	4.1			14.9			14.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	3.5		0.1	0.3			0.3			0.1	
Delay (s)	3.0	9.3		3.1	4.4			15.1			14.8	
Level of Service	A	A		A	A			B			B	
Approach Delay (s)		9.2			4.4			15.1			14.8	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM Average Control Delay			7.8			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			43.3			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			54.3%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+Improvements+OptimizTimings PM_Scenario 5

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	82	200	281	162	111	143	220	489	137	163	485	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			0%			2%	
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1745	1837	1547	1728	1818	1546	1728	3324		1710	3372	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1745	1837	1547	1728	1818	1546	1728	3324		1710	3372	
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	92	225	316	180	123	159	239	532	149	179	533	47
RTOR Reduction (vph)	0	0	75	0	0	84	0	37	0	0	9	0
Lane Group Flow (vph)	92	225	241	180	123	75	239	644	0	179	571	0
Confl. Peds. (#/hr)			2									1
Confl. Bikes (#/hr)									3			2
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot			Prot		
Protected Phases	3	8	5	7	4	1	5	2		1	6	
Permitted Phases			8			4						
Actuated Green, G (s)	3.8	11.9	18.0	7.8	15.5	21.6	6.1	14.9		6.1	14.9	
Effective Green, g (s)	5.8	13.9	22.0	9.8	17.9	25.6	8.1	17.2		8.1	17.2	
Actuated g/C Ratio	0.10	0.23	0.36	0.16	0.29	0.42	0.13	0.28		0.13	0.28	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.4	5.0	5.0	5.3		5.0	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	166	419	634	278	533	649	229	937		227	951	
v/s Ratio Prot	0.05	c0.12	0.05	c0.10	0.07	0.02	c0.14	c0.19		0.10	0.17	
v/s Ratio Perm			0.11			0.03						
v/c Ratio	0.55	0.54	0.38	0.65	0.23	0.12	1.04	0.69		0.79	0.60	
Uniform Delay, d1	26.4	20.7	14.4	24.0	16.3	10.8	26.4	19.5		25.6	18.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.7	0.1	3.9	0.1	0.0	71.4	1.7		15.3	0.7	
Delay (s)	28.6	21.4	14.6	27.8	16.4	10.8	97.8	21.2		40.9	19.7	
Level of Service	C	C	B	C	B	B	F	C		D	B	
Approach Delay (s)		19.0			18.9			41.1			24.7	
Approach LOS		B			B			D			C	
Intersection Summary												
HCM Average Control Delay			27.9				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			61.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			60.0%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimizTimings PM_Scenario 5

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	17	16	147	9	97	44	880	258	151	828	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-2%			2%	
Total Lost time (s)		2.0	4.0		3.0	3.0	2.0	3.0		2.5	3.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1774	1534		1712	1531	1744	3348		1710	3398	
Flt Permitted		0.75	1.00		0.68	1.00	0.26	1.00		0.12	1.00	
Satd. Flow (perm)		1374	1534		1216	1531	484	3348		221	3398	
Peak-hour factor, PHF	0.78	0.78	0.78	0.82	0.82	0.82	0.96	0.96	0.96	0.94	0.94	0.94
Adj. Flow (vph)	54	22	21	179	11	118	46	917	269	161	881	34
RTOR Reduction (vph)	0	0	16	0	0	90	0	22	0	0	2	0
Lane Group Flow (vph)	0	76	5	0	190	28	46	1164	0	161	913	0
Confl. Peds. (#/hr)			4	4			5		5	5		5
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm		Perm	Perm		Perm	pm+pt			pm+pt		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		
Actuated Green, G (s)		13.0	13.0		13.0	13.0	32.2	29.0		37.6	31.7	
Effective Green, g (s)		16.0	14.0		15.0	15.0	38.2	32.0		42.4	34.7	
Actuated g/C Ratio		0.25	0.22		0.23	0.23	0.60	0.50		0.66	0.54	
Clearance Time (s)		5.0	5.0		5.0	5.0	5.0	6.0		5.0	6.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		344	336		285	359	412	1677		342	1845	
v/s Ratio Prot							0.01	c0.35		c0.06	0.27	
v/s Ratio Perm		0.06	0.00		c0.16	0.02	0.06			0.25		
v/c Ratio		0.22	0.01		0.67	0.08	0.11	0.69		0.47	0.49	
Uniform Delay, d1		19.0	19.5		22.2	19.1	5.5	12.2		7.4	9.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1	0.0		4.5	0.0	0.0	1.0		0.4	0.1	
Delay (s)		19.1	19.5		26.7	19.1	5.6	13.2		7.8	9.2	
Level of Service		B	B		C	B	A	B		A	A	
Approach Delay (s)		19.2			23.8			12.9			9.0	
Approach LOS		B			C			B			A	
Intersection Summary												
HCM Average Control Delay		12.8										
HCM Volume to Capacity ratio		0.65										
Actuated Cycle Length (s)		63.9										
Intersection Capacity Utilization		66.3%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimizTimings PM_Scenario 5



Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Volume (vph)	65	165	11	107	1203	2	1041	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%				0%		-3%	
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	0.85		1.00	1.00	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1745	1534		1728	3455	1736	3438	
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1745	1534		1728	3455	1736	3438	
Peak-hour factor, PHF	0.93	0.93	0.96	0.96	0.96	0.94	0.94	0.94
Adj. Flow (vph)	70	177	11	111	1253	2	1107	78
RTOR Reduction (vph)	0	159	0	0	0	0	3	0
Lane Group Flow (vph)	70	18	0	122	1253	2	1182	0
Confl. Peds. (#/hr)	3	2						
Heavy Vehicles (%)	0%	0%	1%	1%	1%	2%	2%	2%
Turn Type		Perm	Prot	Prot		Prot		
Protected Phases	8		5	5	2	1	6	
Permitted Phases	8	8						
Actuated Green, G (s)	8.8	8.8		13.0	82.6	1.0	71.0	
Effective Green, g (s)	11.4	11.4		15.6	85.6	4.0	74.0	
Actuated g/C Ratio	0.10	0.10		0.14	0.78	0.04	0.67	
Clearance Time (s)	5.6	5.6		5.6	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0		3.0	3.0	2.0	2.0	
Lane Grp Cap (vph)	181	159		245	2689	63	2313	
v/s Ratio Prot	c0.04			c0.07	0.36	0.00	c0.34	
v/s Ratio Perm		0.01						
v/c Ratio	0.39	0.12		0.50	0.47	0.03	0.51	
Uniform Delay, d1	46.0	44.7		43.6	4.2	51.1	9.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.1		1.6	0.6	0.1	0.8	
Delay (s)	46.5	44.8		45.2	4.8	51.2	9.8	
Level of Service	D	D		D	A	D	A	
Approach Delay (s)	45.3				8.4		9.9	
Approach LOS	D				A		A	

Intersection Summary

HCM Average Control Delay	12.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+Improvements+OptimizTimings PM_Scenario 5

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	11	2	19	122	10	191	9	1179	180	9	282	992
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	3.0	3.0	2.3		3.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00	0.99		1.00	0.98	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85		1.00	1.00
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1762	1539		1738	1516	1728	3455	1546		1728	3446
Flt Permitted		0.96	1.00		0.96	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1762	1539		1738	1516	1728	3455	1546		1728	3446
Peak-hour factor, PHF	0.67	0.67	0.67	0.82	0.82	0.82	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	16	3	28	149	12	233	10	1282	196	10	324	1140
RTOR Reduction (vph)	0	0	26	0	0	197	0	0	145	0	0	0
Lane Group Flow (vph)	0	19	2	0	161	36	10	1282	51	0	334	1155
Confl. Peds. (#/hr)			2			5			5			
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split		Perm	Split		Perm	Prot		Over		Prot	Prot
Protected Phases	3	3		4	4		5	2	4	1	1	6
Permitted Phases			3			4						
Actuated Green, G (s)		3.9	3.9		14.7	14.7	1.3	32.9	14.7		35.2	66.8
Effective Green, g (s)		6.9	6.9		17.0	17.0	4.3	35.9	17.7		38.2	68.8
Actuated g/C Ratio		0.06	0.06		0.15	0.15	0.04	0.33	0.16		0.35	0.63
Clearance Time (s)		6.0	6.0		5.3	5.3	6.0	6.0	5.3		6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		111	97		269	234	68	1128	249		600	2155
v/s Ratio Prot		c0.01			c0.09		0.01	c0.37	0.03		c0.19	0.34
v/s Ratio Perm			0.00			0.02						
v/c Ratio		0.17	0.02		0.60	0.15	0.15	1.14	0.20		0.56	0.54
Uniform Delay, d1		48.8	48.4		43.3	40.3	51.1	37.0	40.0		29.0	11.6
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3	0.0		2.4	0.1	0.4	72.7	0.1		0.6	1.0
Delay (s)		49.1	48.4		45.7	40.4	51.4	109.7	40.2		29.7	12.6
Level of Service		D	D		D	D	D	F	D		C	B
Approach Delay (s)		48.7			42.6			100.2				16.4
Approach LOS		D			D			F				B
Intersection Summary												
HCM Average Control Delay			56.3				HCM Level of Service		E			
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)		12.0			
Intersection Capacity Utilization			80.8%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimizTimings PM_Scenario 5

Movement	SBR
Lane Configurations	
Volume (vph)	13
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.87
Adj. Flow (vph)	15
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	9
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+Improvements+OptimizTimings PM_Scenario 5

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	81	13	100	97	458	25	734	165	441	373	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-2%			0%			0%	
Total Lost time (s)	5.7	5.7		3.1	5.7	3.1	6.0	3.0	3.0	3.4	3.0	6.0
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.90	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1662	1701		1745	1572	1483	1728	3455	1512	3319	1801	1490
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1662	1701		1745	1572	1483	1728	3455	1512	3319	1801	1490
Peak-hour factor, PHF	0.95	0.95	0.95	0.94	0.94	0.94	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	85	85	14	106	103	487	28	816	183	490	414	29
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	97	0	0	7
Lane Group Flow (vph)	85	95	0	106	303	287	28	816	86	490	414	22
Confl. Peds. (#/hr)			12						8			2
Heavy Vehicles (%)	5%	5%	5%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	11.4	29.7		13.0	31.3	31.3	3.6	40.0	40.0	24.1	60.5	60.5
Effective Green, g (s)	11.4	29.7		15.6	31.3	33.9	3.6	43.0	43.0	26.7	63.5	60.5
Actuated g/C Ratio	0.09	0.23		0.12	0.24	0.26	0.03	0.33	0.33	0.21	0.49	0.46
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	146	388		209	378	386	48	1141	499	681	878	692
v/s Ratio Prot	0.05	0.06		c0.06	0.19		0.02	c0.24		c0.15	0.23	
v/s Ratio Perm						c0.19			0.06			0.01
v/c Ratio	0.58	0.25		0.51	0.80	0.74	0.58	0.72	0.17	0.72	0.47	0.03
Uniform Delay, d1	57.1	41.1		53.7	46.5	44.2	62.6	38.2	31.0	48.3	22.2	18.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.8	0.1		0.7	11.0	6.6	11.1	1.8	0.1	3.0	0.1	0.0
Delay (s)	60.9	41.2		54.4	57.5	50.8	73.7	40.0	31.0	51.3	22.3	18.9
Level of Service	E	D		D	E	D	E	D	C	D	C	B
Approach Delay (s)		50.3			54.3			39.3			37.4	
Approach LOS		D			D			D			D	

Intersection Summary

HCM Average Control Delay	43.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	130.2	Sum of lost time (s)	9.5
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

870: Sahalee Way NE & 223rd AVE NE

Sammamish 228th Ave Corridor Analysis

2020 Vol+Improvements+OptimzTimings AM_Scenario 6

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	369	33	1	941	0	85	1	13	6	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.98			0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1711	1775		1743	1837			1724			1688	
Flt Permitted	0.14	1.00		0.47	1.00			0.74			0.91	
Satd. Flow (perm)	250	1775		865	1837			1325			1549	
Peak-hour factor, PHF	0.88	0.88	0.88	0.94	0.94	0.94	0.73	0.73	0.73	0.83	0.83	0.83
Adj. Flow (vph)	6	419	38	1	1001	0	116	1	18	7	0	20
RTOR Reduction (vph)	0	5	0	0	0	0	0	11	0	0	16	0
Lane Group Flow (vph)	6	453	0	1	1001	0	0	124	0	0	11	0
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	31.3	31.3		31.3	31.3			8.1			8.1	
Effective Green, g (s)	32.3	32.3		32.3	32.3			9.1			9.1	
Actuated g/C Ratio	0.65	0.65		0.65	0.65			0.18			0.18	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	163	1161		566	1201			244			285	
v/s Ratio Prot		0.25			c0.55							
v/s Ratio Perm	0.02			0.00				c0.09			0.01	
v/c Ratio	0.04	0.39		0.00	0.83			0.51			0.04	
Uniform Delay, d1	3.0	4.0		3.0	6.5			18.1			16.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	0.2		0.0	5.1			1.7			0.1	
Delay (s)	3.1	4.2		3.0	11.6			19.8			16.6	
Level of Service	A	A		A	B			B			B	
Approach Delay (s)		4.2			11.6			19.8			16.6	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM Average Control Delay			10.3			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			49.4			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			68.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+Improvements+OptimzTimings AM_Scenario 6

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	104	123	187	557	134	110	134	632	221	124	699	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			0%			2%	
Total Lost time (s)	3.0	3.0	3.0	3.4	3.0	3.0	3.0	3.0	3.3	3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1678	1766	1483	1594	1627	1485	1694	3388	1458	1694	3349	
Flt Permitted	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1678	1766	1483	1594	1627	1485	1694	3388	1458	1694	3349	
Peak-hour factor, PHF	0.70	0.70	0.70	0.71	0.71	0.71	0.79	0.79	0.79	0.79	0.79	0.79
Adj. Flow (vph)	149	176	267	785	189	155	170	800	280	157	885	62
RTOR Reduction (vph)	0	0	15	0	0	93	0	0	124	0	5	0
Lane Group Flow (vph)	149	176	252	479	495	62	170	800	156	157	942	0
Confl. Peds. (#/hr)			5			2			7			1
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	Split		pm+ov	Split		pm+ov	Prot		Perm	Prot		
Protected Phases	8	8	5	4	4	1	5	2		1	6	
Permitted Phases			8			4			2			
Actuated Green, G (s)	12.9	12.9	20.9	25.6	25.6	32.6	8.0	24.7	24.7	7.0	23.7	
Effective Green, g (s)	14.9	14.9	24.9	27.6	28.0	36.6	10.0	27.0	26.7	9.0	26.0	
Actuated g/C Ratio	0.16	0.16	0.27	0.30	0.31	0.40	0.11	0.30	0.29	0.10	0.29	
Clearance Time (s)	5.0	5.0	5.0	5.4	5.4	5.0	5.0	5.3	5.3	5.0	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	275	289	455	484	501	598	186	1006	428	168	958	
v/s Ratio Prot	0.09	c0.10	0.06	0.30	c0.30	0.01	c0.10	0.24		0.09	c0.28	
v/s Ratio Perm			0.11			0.03			0.11			
v/c Ratio	0.54	0.61	0.55	0.99	0.99	0.10	0.91	0.80	0.37	0.93	0.98	
Uniform Delay, d1	34.9	35.3	28.2	31.5	31.3	16.9	40.0	29.4	25.4	40.7	32.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	2.5	0.8	37.7	36.6	0.0	41.6	4.1	0.2	49.7	24.8	
Delay (s)	36.0	37.8	29.1	69.2	67.9	17.0	81.6	33.5	25.6	90.4	57.0	
Level of Service	D	D	C	E	E	B	F	C	C	F	E	
Approach Delay (s)		33.4			61.5			38.3			61.8	
Approach LOS		C			E			D			E	
Intersection Summary												
HCM Average Control Delay	50.4			HCM Level of Service					D			
HCM Volume to Capacity ratio	0.90											
Actuated Cycle Length (s)	90.9			Sum of lost time (s)					12.0			
Intersection Capacity Utilization	68.2%			ICU Level of Service					C			
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+Improvements+OptimzTimings AM_Scenario 6

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	3	186	254	16	188	57	616	76	17	589	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-2%			2%	
Total Lost time (s)		2.0	4.0		3.0	3.0	1.0	3.0		1.5	3.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1758	1541		1735	1546	1711	3357		1661	3256	
Flt Permitted		0.73	1.00		0.71	1.00	0.26	1.00		0.20	1.00	
Satd. Flow (perm)		1339	1541		1290	1546	471	3357		352	3256	
Peak-hour factor, PHF	0.75	0.75	0.75	0.93	0.93	0.93	0.70	0.70	0.70	0.89	0.89	0.89
Adj. Flow (vph)	35	4	248	273	17	202	81	880	109	19	662	85
RTOR Reduction (vph)	0	0	123	0	0	131	0	8	0	0	9	0
Lane Group Flow (vph)	0	39	125	0	290	71	81	981	0	19	738	0
Confl. Peds. (#/hr)			1	1			2		2	2		2
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	3%	3%	3%	4%	4%	4%
Turn Type	Perm		Perm	Perm		Perm	pm+pt			pm+pt		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		
Actuated Green, G (s)		18.6	18.6		18.6	18.6	27.1	24.0		22.3	21.6	
Effective Green, g (s)		21.6	19.6		20.6	20.6	31.7	27.0		27.3	24.6	
Actuated g/C Ratio		0.37	0.34		0.35	0.35	0.54	0.46		0.47	0.42	
Clearance Time (s)		5.0	5.0		5.0	5.0	4.0	6.0		4.0	6.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)		496	518		456	546	386	1555		237	1374	
v/s Ratio Prot							c0.02	c0.29		0.00	0.23	
v/s Ratio Perm		0.03	0.08		c0.22	0.05	0.09			0.03		
v/c Ratio		0.08	0.24		0.64	0.13	0.21	0.63		0.08	0.54	
Uniform Delay, d1		11.9	14.0		15.7	12.8	6.9	11.9		8.8	12.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.1		2.1	0.0	0.3	0.6		0.1	0.2	
Delay (s)		11.9	14.1		17.9	12.8	7.2	12.5		9.0	12.8	
Level of Service		B	B		B	B	A	B		A	B	
Approach Delay (s)		13.8			15.8			12.1			12.7	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			13.1		HCM Level of Service					B		
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			58.3		Sum of lost time (s)					4.0		
Intersection Capacity Utilization			62.0%		ICU Level of Service					B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+Improvements+OptimzTimings AM_Scenario 6



Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Volume (vph)	67	94	1	156	789	0	764	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%				0%		-3%	
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.85		1.00	1.00		0.99	
Flt Protected	0.95	1.00		0.95	1.00		1.00	
Satd. Flow (prot)	1711	1505		1678	3355		3376	
Flt Permitted	0.95	1.00		0.95	1.00		1.00	
Satd. Flow (perm)	1711	1505		1678	3355		3376	
Peak-hour factor, PHF	0.65	0.65	0.69	0.69	0.69	0.82	0.82	0.82
Adj. Flow (vph)	103	145	1	226	1143	0	932	48
RTOR Reduction (vph)	0	127	0	0	0	0	3	0
Lane Group Flow (vph)	103	18	0	227	1143	0	977	0
Confl. Peds. (#/hr)	2	2						2
Heavy Vehicles (%)	2%	2%	4%	4%	4%	4%	4%	4%
Turn Type		Perm	Prot	Prot		Prot		
Protected Phases	8		5	5	2	1	6	
Permitted Phases	8	8						
Actuated Green, G (s)	11.0	11.0		20.0	87.4		61.8	
Effective Green, g (s)	13.6	13.6		22.6	90.4		64.8	
Actuated g/C Ratio	0.12	0.12		0.21	0.82		0.59	
Clearance Time (s)	5.6	5.6		5.6	6.0		6.0	
Vehicle Extension (s)	2.0	2.0		3.0	3.0		2.0	
Lane Grp Cap (vph)	212	186		345	2757		1989	
v/s Ratio Prot	c0.06			c0.14	0.34		c0.29	
v/s Ratio Perm		0.01						
v/c Ratio	0.49	0.10		0.66	0.41		0.49	
Uniform Delay, d1	44.9	42.8		40.1	2.6		13.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.6	0.1		4.5	0.5		0.9	
Delay (s)	45.6	42.8		44.6	3.1		13.9	
Level of Service	D	D		D	A		B	
Approach Delay (s)	44.0				10.0		13.9	
Approach LOS	D				A		B	

Intersection Summary

HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+Improvements+OptimzTimings AM_Scenario 6

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	0	1	128	0	294	2	711	82	114	868	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1745	1539		1694	1493	1678	3355	1501	1678	3355	
Flt Permitted		0.95	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1745	1539		1694	1493	1678	3355	1501	1678	3355	
Peak-hour factor, PHF	0.42	0.42	0.42	0.84	0.84	0.84	0.76	0.76	0.76	0.80	0.80	0.80
Adj. Flow (vph)	5	0	2	152	0	350	3	936	108	142	1085	1
RTOR Reduction (vph)	0	0	2	0	0	297	0	0	32	0	0	0
Lane Group Flow (vph)	0	5	0	0	152	53	3	936	76	142	1086	0
Confl. Peds. (#/hr)			2			1			3			2
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Split		Perm	Split		Perm	Prot		pt+ov	Prot		
Protected Phases	3	3		4	4		5	2	2 4	1	6	
Permitted Phases			3			4						
Actuated Green, G (s)		1.2	1.2		14.5	14.5	1.1	57.4	71.9	13.6	69.9	
Effective Green, g (s)		4.2	4.2		16.8	16.8	4.1	60.4	77.9	16.6	71.9	
Actuated g/C Ratio		0.04	0.04		0.15	0.15	0.04	0.55	0.71	0.15	0.65	
Clearance Time (s)		6.0	6.0		5.3	5.3	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		67	59		259	228	63	1842	1063	253	2193	
v/s Ratio Prot		c0.00			c0.09		0.00	c0.28	0.05	c0.08	0.32	
v/s Ratio Perm			0.00			0.04						
v/c Ratio		0.07	0.00		0.59	0.23	0.05	0.51	0.07	0.56	0.50	
Uniform Delay, d1		51.0	50.9		43.4	40.9	51.1	15.5	4.9	43.3	9.8	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2	0.0		2.2	0.2	0.1	1.0	0.0	1.7	0.8	
Delay (s)		51.2	50.9		45.6	41.1	51.2	16.5	4.9	45.0	10.6	
Level of Service		D	D		D	D	D	B	A	D	B	
Approach Delay (s)		51.1			42.5			15.4			14.5	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM Average Control Delay			20.0				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			63.0%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+Improvements+OptimzTimings AM_Scenario 6

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	148	116	131	241	111	388	36	239	76	349	686	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-2%			0%			0%	
Total Lost time (s)	5.7	5.7		3.1	5.7	3.1	6.0	3.0	3.0	3.4	3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.92		1.00	0.91	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1678	1613		1663	1520	1413	1646	3292	1444	3255	3355	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1678	1613		1663	1520	1413	1646	3292	1444	3255	3355	
Peak-hour factor, PHF	0.66	0.66	0.66	0.90	0.90	0.90	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	224	176	198	268	123	431	41	272	86	392	771	0
RTOR Reduction (vph)	0	28	0	0	0	0	0	0	67	0	0	0
Lane Group Flow (vph)	224	346	0	268	287	267	41	272	19	392	771	0
Confl. Peds. (#/hr)			3						7			3
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	6%	6%	6%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4			2			
Actuated Green, G (s)	20.5	30.3		23.3	33.1	33.1	5.8	22.7	22.7	18.0	34.9	
Effective Green, g (s)	20.5	30.3		25.9	33.1	35.7	5.8	25.7	25.7	20.6	37.9	
Actuated g/C Ratio	0.17	0.26		0.22	0.28	0.30	0.05	0.22	0.22	0.18	0.32	
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	292	415		366	427	429	81	719	315	570	1080	
v/s Ratio Prot	0.13	c0.21		c0.16	c0.19		0.02	0.08		c0.12	c0.23	
v/s Ratio Perm						0.19			0.01			
v/c Ratio	0.77	0.83		0.73	0.67	0.62	0.51	0.38	0.06	0.69	0.71	
Uniform Delay, d1	46.3	41.3		42.7	37.5	35.2	54.6	39.2	36.4	45.5	35.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.3	12.8		6.4	3.3	2.0	1.8	0.1	0.0	2.8	1.9	
Delay (s)	56.7	54.2		49.1	40.8	37.2	56.4	39.3	36.5	48.3	37.0	
Level of Service	E	D		D	D	D	E	D	D	D	D	
Approach Delay (s)		55.1			42.3			40.5			40.8	
Approach LOS		E			D			D			D	
Intersection Summary												
HCM Average Control Delay			44.0			HCM Level of Service			D			
HCM Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			117.7			Sum of lost time (s)			17.9			
Intersection Capacity Utilization			68.4%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

870: Sahalee Way NE & 223rd AVE NE

Sammamish 228th Ave Corridor Analysis

2020 Vol+Improvements+OptimizTimings PM_Scenario 6

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	887	94	12	478	18	24	2	15	10	2	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.95			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.97	
Satd. Flow (prot)	1745	1806		1744	1825			1683			1753	
Flt Permitted	0.43	1.00		0.16	1.00			0.80			0.81	
Satd. Flow (perm)	791	1806		302	1825			1389			1451	
Peak-hour factor, PHF	0.91	0.91	0.91	0.88	0.88	0.88	0.71	0.71	0.71	0.64	0.64	0.64
Adj. Flow (vph)	13	975	103	14	543	20	34	3	21	16	3	12
RTOR Reduction (vph)	0	4	0	0	1	0	0	19	0	0	11	0
Lane Group Flow (vph)	13	1074	0	14	562	0	0	39	0	0	20	0
Confl. Peds. (#/hr)			2	2		1			2	2		
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	35.6	35.6		35.6	35.6			3.8			3.8	
Effective Green, g (s)	36.6	36.6		36.6	36.6			4.8			4.8	
Actuated g/C Ratio	0.74	0.74		0.74	0.74			0.10			0.10	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	586	1338		224	1352			135			141	
v/s Ratio Prot		c0.59			0.31							
v/s Ratio Perm	0.02			0.05				c0.03			0.01	
v/c Ratio	0.02	0.80		0.06	0.42			0.29			0.14	
Uniform Delay, d1	1.7	4.1		1.7	2.4			20.7			20.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	3.6		0.1	0.2			1.2			0.5	
Delay (s)	1.7	7.7		1.9	2.6			21.9			20.9	
Level of Service	A	A		A	A			C			C	
Approach Delay (s)		7.6			2.6			21.9			20.9	
Approach LOS		A			A			C			C	
Intersection Summary												
HCM Average Control Delay			6.7			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			49.4			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			63.1%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+Improvements+OptimizTimings PM_Scenario 6

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	107	208	184	320	105	122	158	651	373	230	528	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			0%			2%	
Total Lost time (s)	3.0	3.0	3.0	3.4	3.0	3.0	3.0	3.0	3.3	3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1745	1837	1548	1641	1685	1546	1728	3455	1508	1710	3370	
Flt Permitted	0.95	1.00	1.00	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1745	1837	1548	1641	1685	1546	1728	3455	1508	1710	3370	
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	120	234	207	356	117	136	172	708	405	253	580	54
RTOR Reduction (vph)	0	0	79	0	0	85	0	0	223	0	8	0
Lane Group Flow (vph)	120	234	128	235	238	51	172	708	182	253	626	0
Confl. Peds. (#/hr)			2									1
Confl. Bikes (#/hr)									3			2
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split		pm+ov	Split		pm+ov	Prot		Perm		Prot	
Protected Phases	8	8	5	4	4	1	5	2		1	6	
Permitted Phases			8			4			2			
Actuated Green, G (s)	13.2	13.2	22.0	14.7	14.7	23.8	8.8	17.0	17.0	9.1	17.3	
Effective Green, g (s)	15.2	15.2	26.0	16.7	17.1	27.8	10.8	19.3	19.0	11.1	19.6	
Actuated g/C Ratio	0.20	0.20	0.35	0.22	0.23	0.37	0.14	0.26	0.25	0.15	0.26	
Clearance Time (s)	5.0	5.0	5.0	5.4	5.4	5.0	5.0	5.3	5.3	5.0	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	355	374	601	367	386	575	250	893	384	254	884	
v/s Ratio Prot	0.07	c0.13	0.03	c0.14	0.14	0.01	0.10	c0.20		c0.15	0.19	
v/s Ratio Perm			0.05			0.02			0.12			
v/c Ratio	0.34	0.63	0.21	0.64	0.62	0.09	0.69	0.79	0.47	1.00	0.71	
Uniform Delay, d1	25.4	27.2	17.1	26.3	25.9	15.2	30.3	25.8	23.6	31.8	25.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	2.3	0.1	2.8	2.1	0.0	6.1	4.6	0.3	55.0	2.1	
Delay (s)	25.7	29.5	17.2	29.1	27.9	15.2	36.5	30.4	24.0	86.7	27.1	
Level of Service	C	C	B	C	C	B	D	C	C	F	C	
Approach Delay (s)		24.1			25.6			29.2			44.1	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM Average Control Delay			31.6			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			74.7			Sum of lost time (s)			12.4			
Intersection Capacity Utilization			66.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+Improvements+OptimizTimings PM_Scenario 6

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	100	17	135	150	11	100	129	72	820	260	1	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%				-2%			
Total Lost time (s)		2.0	4.0		3.0	3.0		2.0	3.0			2.5
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00	0.95			1.00
Frpb, ped/bikes		1.00	0.98		1.00	1.00		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.85		1.00	0.85		1.00	0.96			1.00
Flt Protected		0.96	1.00		0.96	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1762	1538		1717	1531		1745	3337			1710
Flt Permitted		0.67	1.00		0.62	1.00		0.13	1.00			0.15
Satd. Flow (perm)		1235	1538		1111	1531		248	3337			265
Peak-hour factor, PHF	0.78	0.78	0.78	0.82	0.82	0.82	0.96	0.96	0.96	0.96	0.94	0.94
Adj. Flow (vph)	128	22	173	183	13	122	134	75	854	271	1	53
RTOR Reduction (vph)	0	0	50	0	0	73	0	0	29	0	0	0
Lane Group Flow (vph)	0	150	123	0	196	49	0	209	1096	0	0	54
Confl. Peds. (#/hr)			4	4				5		5		5
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm		Perm	Perm		Perm	pm+pt	pm+pt			pm+pt	pm+pt
Protected Phases		8			4		5	5	2		1	1
Permitted Phases	8		8	4		4	2	2			6	6
Actuated Green, G (s)		28.6	28.6		28.6	28.6		36.2	28.9			27.8
Effective Green, g (s)		31.6	29.6		30.6	30.6		40.0	31.9			32.8
Actuated g/C Ratio		0.41	0.39		0.40	0.40		0.52	0.42			0.43
Clearance Time (s)		5.0	5.0		5.0	5.0		5.0	6.0			5.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)		509	594		444	612		331	1390			219
v/s Ratio Prot								c0.08	c0.33			0.02
v/s Ratio Perm		0.12	0.08		c0.18	0.03		0.25				0.09
v/c Ratio		0.29	0.21		0.44	0.08		0.63	0.79			0.25
Uniform Delay, d1		15.0	15.7		16.8	14.3		12.9	19.4			14.5
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		0.1	0.1		0.3	0.0		2.9	2.8			0.2
Delay (s)		15.2	15.7		17.0	14.3		15.7	22.2			14.7
Level of Service		B	B		B	B		B	C			B
Approach Delay (s)		15.5			16.0				21.2			
Approach LOS		B			B				C			
Intersection Summary												
HCM Average Control Delay			20.7			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			76.6			Sum of lost time (s)			5.0			
Intersection Capacity Utilization			67.0%			ICU Level of Service			C			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+Improvements+OptimizTimings PM_Scenario 6



Movement	SBT	SBR
Lane Configurations	↑↑	↑
Volume (vph)	749	111
Ideal Flow (vphpl)	1900	1900
Grade (%)	2%	
Total Lost time (s)	3.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.98	
Flt Protected	1.00	
Satd. Flow (prot)	3341	
Flt Permitted	1.00	
Satd. Flow (perm)	3341	
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	797	118
RTOR Reduction (vph)	12	0
Lane Group Flow (vph)	903	0
Confl. Peds. (#/hr)		5
Heavy Vehicles (%)	1%	1%
Turn Type		
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	24.7	
Effective Green, g (s)	27.7	
Actuated g/C Ratio	0.36	
Clearance Time (s)	6.0	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	1208	
v/s Ratio Prot	0.27	
v/s Ratio Perm		
v/c Ratio	0.75	
Uniform Delay, d1	21.4	
Progression Factor	1.00	
Incremental Delay, d2	2.2	
Delay (s)	23.6	
Level of Service	C	
Approach Delay (s)	23.1	
Approach LOS	C	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis

650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+Improvements+OptimizTimings PM_Scenario 6



Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Volume (vph)	43	238	1	184	1147	1	845	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%				0%		-3%	
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	0.85		1.00	1.00	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1745	1533		1728	3455	1736	3430	
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1745	1533		1728	3455	1736	3430	
Peak-hour factor, PHF	0.93	0.93	0.96	0.96	0.96	0.94	0.94	0.94
Adj. Flow (vph)	46	256	1	192	1195	1	899	81
RTOR Reduction (vph)	0	231	0	0	0	0	4	0
Lane Group Flow (vph)	46	25	0	193	1195	1	976	0
Confl. Peds. (#/hr)	3	2						
Heavy Vehicles (%)	0%	0%	1%	1%	1%	2%	2%	2%
Turn Type		Perm	Prot	Prot		Prot		
Protected Phases	8		5	5	2	1	6	
Permitted Phases	8	8						
Actuated Green, G (s)	8.3	8.3		17.4	83.1	1.0	67.1	
Effective Green, g (s)	10.9	10.9		20.0	86.1	4.0	70.1	
Actuated g/C Ratio	0.10	0.10		0.18	0.78	0.04	0.64	
Clearance Time (s)	5.6	5.6		5.6	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0		3.0	3.0	2.0	2.0	
Lane Grp Cap (vph)	173	152		314	2704	63	2186	
v/s Ratio Prot	c0.03			c0.11	c0.35	0.00	0.28	
v/s Ratio Perm		0.02						
v/c Ratio	0.27	0.17		0.61	0.44	0.02	0.45	
Uniform Delay, d1	45.8	45.4		41.5	4.0	51.1	10.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.2		3.5	0.5	0.0	0.7	
Delay (s)	46.1	45.6		45.0	4.5	51.1	10.8	
Level of Service	D	D		D	A	D	B	
Approach Delay (s)	45.7				10.1		10.8	
Approach LOS	D				B		B	

Intersection Summary

HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+Improvements+OptimizTimings PM_Scenario 6

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	6	2	5	107	1	205	7	1145	215	1	307	827
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00	0.99		1.00	0.98	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85		1.00	1.00
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1770	1539		1733	1516	1728	3455	1546		1728	3451
Flt Permitted		0.96	1.00		0.95	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1770	1539		1733	1516	1728	3455	1546		1728	3451
Peak-hour factor, PHF	0.67	0.67	0.67	0.82	0.82	0.82	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	9	3	7	130	1	250	8	1245	234	1	353	951
RTOR Reduction (vph)	0	0	7	0	0	215	0	0	123	0	0	0
Lane Group Flow (vph)	0	12	0	0	131	35	8	1245	111	0	354	956
Confl. Peds. (#/hr)			2			5			5			
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split		Perm	Split		Perm	Prot		pt+ov	Prot	Prot	
Protected Phases	3	3		4	4		5	2	2 4	1	1	6
Permitted Phases			3			4						
Actuated Green, G (s)		2.5	2.5		13.0	13.0	1.3	33.4	46.4		37.8	69.9
Effective Green, g (s)		5.5	5.5		15.3	15.3	4.3	36.4	52.4		40.8	71.9
Actuated g/C Ratio		0.05	0.05		0.14	0.14	0.04	0.33	0.48		0.37	0.65
Clearance Time (s)		6.0	6.0		5.3	5.3	6.0	6.0			6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)		89	77		241	211	68	1143	736		641	2256
v/s Ratio Prot		c0.01			c0.08		0.00	c0.36	0.07		c0.20	0.28
v/s Ratio Perm			0.00			0.02						
v/c Ratio		0.13	0.00		0.54	0.16	0.12	1.09	0.15		0.55	0.42
Uniform Delay, d1		50.0	49.6		44.1	41.7	51.0	36.8	16.3		27.4	9.1
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3	0.0		1.3	0.1	0.3	54.4	0.0		0.6	0.6
Delay (s)		50.2	49.7		45.4	41.9	51.3	91.2	16.3		28.0	9.7
Level of Service		D	D		D	D	D	F	B		C	A
Approach Delay (s)		50.0			43.1			79.2				14.6
Approach LOS		D			D			E				B
Intersection Summary												
HCM Average Control Delay			48.3				HCM Level of Service				D	
HCM Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)		12.0			
Intersection Capacity Utilization			81.5%				ICU Level of Service				D	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+Improvements+OptimizTimings PM_Scenario 6

Movement	SBR
Lane Configurations	
Volume (vph)	4
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.87
Adj. Flow (vph)	5
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	9
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+Improvements+OptimizTimings PM_Scenario 6

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	218	116	50	165	130	459	37	647	190	496	373	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-2%			0%			0%	
Total Lost time (s)	5.7	5.7		3.1	5.7	3.1	6.0	3.0	3.0	3.4	3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.91	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1662	1657		1745	1595	1483	1728	3455	1514	3319	3421	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1662	1657		1745	1595	1483	1728	3455	1514	3319	3421	
Peak-hour factor, PHF	0.95	0.95	0.95	0.94	0.94	0.94	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	229	122	53	176	138	488	41	719	211	551	414	0
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	151	0	0	0
Lane Group Flow (vph)	229	163	0	176	323	303	41	719	60	551	414	0
Confl. Peds. (#/hr)			12						8			2
Heavy Vehicles (%)	5%	5%	5%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4			2			
Actuated Green, G (s)	19.1	30.3		16.2	27.4	27.4	3.8	30.2	30.2	16.4	42.8	
Effective Green, g (s)	19.1	30.3		18.8	27.4	30.0	3.8	33.2	33.2	19.0	45.8	
Actuated g/C Ratio	0.16	0.26		0.16	0.24	0.26	0.03	0.28	0.28	0.16	0.39	
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	272	431		282	375	382	56	985	431	541	1345	
v/s Ratio Prot	c0.14	c0.10		0.10	0.20		0.02	c0.21		c0.17	0.12	
v/s Ratio Perm						c0.20			0.04			
v/c Ratio	0.84	0.38		0.62	0.86	0.79	0.73	0.73	0.14	1.02	0.31	
Uniform Delay, d1	47.2	35.4		45.6	42.7	40.4	55.8	37.6	31.0	48.8	24.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	19.7	0.2		3.1	17.4	10.1	34.2	2.3	0.1	43.4	0.0	
Delay (s)	66.9	35.6		48.6	60.2	50.5	90.1	39.9	31.1	92.2	24.5	
Level of Service	E	D		D	E	D	F	D	C	F	C	
Approach Delay (s)		53.3			54.0			40.1			63.1	
Approach LOS		D			D			D			E	
Intersection Summary												
HCM Average Control Delay			52.4			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			116.5			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			78.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Queues
870: Sahalee Way NE & 223rd AVE NE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimzTimings AM_Scenario 5



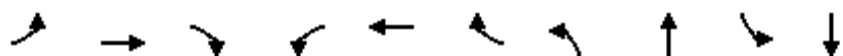
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	6	381	4	957	123	24
v/c Ratio	0.04	0.35	0.01	0.84	0.42	0.07
Control Delay	5.2	5.8	4.5	17.7	21.3	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.2	5.8	4.5	17.7	21.3	10.6
Queue Length 50th (ft)	1	41	1	177	31	2
Queue Length 95th (ft)	5	97	3	#511	54	14
Internal Link Dist (ft)		1214		250	183	717
Turn Bay Length (ft)	100		100			
Base Capacity (vph)	182	1298	693	1339	478	570
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.29	0.01	0.71	0.26	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimzTimings AM_Scenario 5



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	114	169	407	397	200	182	235	704	111	867
v/c Ratio	0.52	0.57	0.79	0.92	0.35	0.25	0.91	0.64	0.63	0.91
Control Delay	43.8	40.7	32.6	60.2	25.9	3.4	75.6	27.1	55.4	45.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	40.7	32.6	60.2	25.9	3.4	75.6	27.1	55.4	45.7
Queue Length 50th (ft)	57	84	158	208	86	0	126	162	58	234
Queue Length 95th (ft)	86	109	173	#268	111	15	#225	200	#108	#298
Internal Link Dist (ft)		1400			557			590		212
Turn Bay Length (ft)	200		200	200		200	200		200	
Base Capacity (vph)	256	394	517	433	608	737	258	1106	179	949
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.43	0.79	0.92	0.33	0.25	0.91	0.64	0.62	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimzTimings AM_Scenario 5



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	19	29	282	196	50	1051	57	756
v/c Ratio	0.05	0.08	0.63	0.30	0.11	0.66	0.18	0.48
Control Delay	13.8	7.0	24.4	4.2	5.5	14.7	6.6	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.8	7.0	24.4	4.2	5.5	14.7	6.6	12.4
Queue Length 50th (ft)	5	0	88	0	6	154	8	99
Queue Length 95th (ft)	14	11	#172	37	13	147	19	142
Internal Link Dist (ft)	203		121			879		601
Turn Bay Length (ft)		25			100		100	
Base Capacity (vph)	1287	1300	459	668	440	1595	312	1562
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	0.01	0.02	0.61	0.29	0.11	0.66	0.18	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimzTimings AM_Scenario 5



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	155	100	144	1200	1193
v/c Ratio	0.59	0.32	0.55	0.45	0.58
Control Delay	51.8	10.2	50.1	4.7	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	51.8	10.2	50.1	4.7	15.9
Queue Length 50th (ft)	103	0	95	115	248
Queue Length 95th (ft)	111	15	112	127	347
Internal Link Dist (ft)	1577			559	368
Turn Bay Length (ft)		100	150		
Base Capacity (vph)	414	440	303	2656	2058
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.37	0.23	0.48	0.45	0.58
Intersection Summary					

Queues
651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimzTimings AM_Scenario 5

	→	↘	←	↖	↙	↑	↗	↘	↓
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	7	5	174	326	4	963	91	136	1305
v/c Ratio	0.05	0.04	0.63	0.63	0.03	0.53	0.27	0.48	0.55
Control Delay	48.0	29.0	52.1	10.0	47.7	20.2	9.6	46.8	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	29.0	52.1	10.0	47.7	20.2	9.6	46.8	11.8
Queue Length 50th (ft)	5	0	116	0	3	195	0	88	147
Queue Length 95th (ft)	9	4	161	53	11	299	26	128	393
Internal Link Dist (ft)	176		180			717			443
Turn Bay Length (ft)		80			180		320	125	
Base Capacity (vph)	476	423	390	595	125	1815	424	286	2376
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.01	0.45	0.55	0.03	0.53	0.21	0.48	0.55
Intersection Summary									

Queues

653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+Improvements+OptimzTimings AM_Scenario 5



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	83	175	162	268	254	27	308	75	348	771	31
v/c Ratio	0.57	0.61	0.61	0.74	0.68	0.36	0.25	0.13	0.66	0.85	0.04
Control Delay	68.7	50.7	56.1	54.9	49.2	72.6	27.8	7.5	52.8	37.9	17.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.7	50.7	56.1	54.9	49.2	72.6	27.8	7.5	52.8	37.9	17.7
Queue Length 50th (ft)	62	114	116	205	189	20	83	0	128	523	9
Queue Length 95th (ft)	90	137	202	317	297	#56	143	35	200	#952	33
Internal Link Dist (ft)		264		438			338			243	
Turn Bay Length (ft)	100		300			125					100
Base Capacity (vph)	211	497	433	603	602	75	1290	611	640	910	715
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.35	0.37	0.44	0.42	0.36	0.24	0.12	0.54	0.85	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
870: Sahalee Way NE & 223rd AVE NE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimizTimings PM_Scenario 5



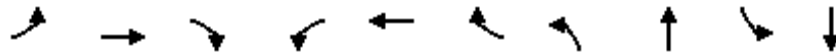
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	12	898	11	537	52	28
v/c Ratio	0.02	0.79	0.05	0.47	0.19	0.10
Control Delay	3.2	12.0	3.7	5.6	15.4	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.2	12.0	3.7	5.6	15.4	14.8
Queue Length 50th (ft)	1	115	1	50	8	4
Queue Length 95th (ft)	5	278	5	106	24	14
Internal Link Dist (ft)		1214		250	183	717
Turn Bay Length (ft)	100		100			
Base Capacity (vph)	622	1469	280	1483	580	620
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.61	0.04	0.36	0.09	0.05
Intersection Summary						

Queues

619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+Improvements+OptimizTimings PM_Scenario 5



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	92	225	316	180	123	159	239	681	179	580
v/c Ratio	0.46	0.54	0.50	0.65	0.26	0.23	1.04	0.70	0.79	0.60
Control Delay	36.1	26.4	11.4	39.6	19.2	3.5	105.2	23.0	56.3	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	26.4	11.4	39.6	19.2	3.5	105.2	23.0	56.3	22.1
Queue Length 50th (ft)	33	76	50	65	36	3	~104	108	67	94
Queue Length 95th (ft)	#87	136	108	#165	75	30	#258	182	#188	159
Internal Link Dist (ft)		1400			557			590		212
Turn Bay Length (ft)	200		200	200		200	200		200	
Base Capacity (vph)	202	608	631	286	692	705	229	1134	226	1125
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.37	0.50	0.63	0.18	0.23	1.04	0.60	0.79	0.52

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.

Queues
616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimizTimings PM_Scenario 5



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	21	190	118	46	1186	161	915
v/c Ratio	0.24	0.06	0.65	0.26	0.10	0.72	0.47	0.48
Control Delay	20.1	9.2	32.5	5.9	4.2	15.5	11.2	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	9.2	32.5	5.9	4.2	15.5	11.2	10.5
Queue Length 50th (ft)	22	0	64	0	4	160	17	109
Queue Length 95th (ft)	44	12	111	26	15	264	64	187
Internal Link Dist (ft)	203		121			879		601
Turn Bay Length (ft)		25			100		100	
Base Capacity (vph)	978	1051	293	460	496	1646	348	1909
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	0.08	0.02	0.65	0.26	0.09	0.72	0.46	0.48
Intersection Summary								

Queues
650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimizTimings PM_Scenario 5



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT
Lane Group Flow (vph)	70	177	122	1253	2	1185
v/c Ratio	0.39	0.56	0.50	0.44	0.02	0.51
Control Delay	51.4	13.7	49.9	4.1	47.5	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.4	13.7	49.9	4.1	47.5	10.8
Queue Length 50th (ft)	47	0	81	82	1	196
Queue Length 95th (ft)	90	62	133	234	9	315
Internal Link Dist (ft)	1577			559		368
Turn Bay Length (ft)		100	150		150	
Base Capacity (vph)	431	514	280	2838	127	2316
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.34	0.44	0.44	0.02	0.51
Intersection Summary						

Queues
651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2011 ExiCounts+Improvements+OptimizTimings PM_Scenario 5



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	19	28	161	233	10	1282	196	334	1155
v/c Ratio	0.13	0.19	0.60	0.54	0.08	1.07	0.50	0.56	0.49
Control Delay	48.5	19.5	51.9	9.9	48.1	81.6	12.7	34.6	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	19.5	51.9	9.9	48.1	81.6	12.7	34.6	11.6
Queue Length 50th (ft)	13	0	107	0	7	~533	14	199	187
Queue Length 95th (ft)	27	16	148	45	24	#787	75	280	377
Internal Link Dist (ft)	176		180			717			443
Turn Bay Length (ft)		80			180		320	125	
Base Capacity (vph)	481	440	411	536	157	1201	506	600	2380
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.06	0.39	0.43	0.06	1.07	0.39	0.56	0.49

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.

Queues

653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2011 ExiCounts+Improvements+OptimizTimings PM_Scenario 5



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	85	99	106	303	287	28	816	183	490	414	29
v/c Ratio	0.57	0.25	0.49	0.79	0.73	0.33	0.76	0.32	0.71	0.46	0.04
Control Delay	79.2	43.4	67.0	63.3	57.1	80.4	47.0	11.8	56.4	26.6	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.2	43.4	67.0	63.3	57.1	80.4	47.0	11.8	56.4	26.6	16.4
Queue Length 50th (ft)	69	64	83	248	229	23	318	22	194	238	8
Queue Length 95th (ft)	157	139	180	443	414	69	512	96	336	428	32
Internal Link Dist (ft)		264		438			338			243	
Turn Bay Length (ft)	100		300			125					100
Base Capacity (vph)	230	559	417	628	624	100	1543	754	922	1162	927
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.18	0.25	0.48	0.46	0.28	0.53	0.24	0.53	0.36	0.03

Intersection Summary

Queues
870: Sahalee Way NE & 223rd AVE NE

Sammamish 228th Ave Corridor Analysis
2020 Vol+Improvements+OptimzTimings AM_Scenario 6



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	6	457	1	1001	135	27
v/c Ratio	0.03	0.37	0.00	0.78	0.41	0.07
Control Delay	5.4	6.1	5.0	15.1	21.1	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.4	6.1	5.0	15.1	21.1	10.1
Queue Length 50th (ft)	1	54	0	202	35	2
Queue Length 95th (ft)	5	126	2	#561	58	15
Internal Link Dist (ft)		1214		250	183	717
Turn Bay Length (ft)	100		100			
Base Capacity (vph)	177	1264	613	1303	536	630
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.36	0.00	0.77	0.25	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis

2020 Vol+Improvements+OptimzTimings AM_Scenario 6

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	149	176	267	479	495	155	170	800	280	157	947
v/c Ratio	0.54	0.61	0.63	0.99	0.99	0.22	0.91	0.79	0.51	0.93	0.98
Control Delay	42.5	44.6	31.8	72.5	71.0	2.5	89.7	37.0	14.3	98.4	59.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.5	44.6	31.8	72.5	71.0	2.5	89.7	37.0	14.3	98.4	59.1
Queue Length 50th (ft)	80	95	117	289	298	0	99	223	46	92	284
Queue Length 95th (ft)	105	120	138	#354	#361	9	#190	260	93	#182	#354
Internal Link Dist (ft)	1400			557			590			212	
Turn Bay Length (ft)	200		200	200		200	200		100	200	
Base Capacity (vph)	351	369	421	484	501	696	186	1007	551	168	963
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.48	0.63	0.99	0.99	0.22	0.91	0.79	0.51	0.93	0.98

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+Improvements+OptimzTimings AM_Scenario 6



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	39	248	290	202	81	989	19	747
v/c Ratio	0.07	0.37	0.60	0.29	0.19	0.60	0.06	0.57
Control Delay	12.1	6.4	21.4	3.8	6.9	12.4	6.1	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	6.4	21.4	3.8	6.9	12.4	6.1	15.1
Queue Length 50th (ft)	7	13	71	0	11	105	3	100
Queue Length 95th (ft)	22	40	#172	37	20	142	9	144
Internal Link Dist (ft)	203		121			879		601
Turn Bay Length (ft)		25			200		100	
Base Capacity (vph)	1253	1416	493	716	417	1654	339	1550
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	0.03	0.18	0.59	0.28	0.19	0.60	0.06	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+Improvements+OptimzTimings AM_Scenario 6



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	103	145	227	1143	980
v/c Ratio	0.49	0.46	0.66	0.41	0.49
Control Delay	51.9	11.9	49.1	3.4	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	11.9	49.1	3.4	15.3
Queue Length 50th (ft)	69	0	147	86	199
Queue Length 95th (ft)	83	14	160	96	267
Internal Link Dist (ft)	1577			559	368
Turn Bay Length (ft)		100	200		
Base Capacity (vph)	414	475	353	2757	1992
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.25	0.31	0.64	0.41	0.49
Intersection Summary					

Queues
651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+Improvements+OptimzTimings AM_Scenario 6

	→	↘	←	↖	↙	↑	↗	↘	↓
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	2	152	350	3	936	108	142	1086
v/c Ratio	0.04	0.02	0.59	0.67	0.02	0.47	0.09	0.56	0.44
Control Delay	48.0	33.0	51.7	10.9	47.5	16.1	1.0	51.3	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	33.0	51.7	10.9	47.5	16.1	1.0	51.3	8.5
Queue Length 50th (ft)	3	0	102	0	2	171	0	94	102
Queue Length 95th (ft)	7	3	146	55	9	281	8	132	290
Internal Link Dist (ft)	176		180			717			443
Turn Bay Length (ft)		80			180		320	300	
Base Capacity (vph)	476	421	400	620	137	1990	1294	267	2486
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.00	0.38	0.56	0.02	0.47	0.08	0.53	0.44
Intersection Summary									

Queues
653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+Improvements+OptimzTimings AM_Scenario 6

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	224	374	268	287	267	41	272	86	392	771
v/c Ratio	0.76	0.84	0.73	0.67	0.62	0.39	0.40	0.24	0.68	0.71
Control Delay	67.7	56.7	58.5	48.3	44.6	73.4	44.6	10.8	55.8	42.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.7	56.7	58.5	48.3	44.6	73.4	44.6	10.8	55.8	42.1
Queue Length 50th (ft)	167	250	194	206	185	31	98	0	146	286
Queue Length 95th (ft)	212	280	354	371	342	81	157	44	248	422
Internal Link Dist (ft)		264		438			338			264
Turn Bay Length (ft)	100		300			125			300	
Base Capacity (vph)	433	646	499	615	605	135	1081	531	701	1469
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.58	0.54	0.47	0.44	0.30	0.25	0.16	0.56	0.52
Intersection Summary										

Queues
870: Sahalee Way NE & 223rd AVE NE

Sammamish 228th Ave Corridor Analysis
2020 Vol+Improvements+OptimizTimings PM_Scenario 6



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	13	1078	14	563	58	31
v/c Ratio	0.02	0.71	0.06	0.37	0.20	0.11
Control Delay	2.8	9.1	3.3	3.6	18.8	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.8	9.1	3.3	3.6	18.8	18.7
Queue Length 50th (ft)	1	181	1	56	12	6
Queue Length 95th (ft)	5	#580	6	114	30	18
Internal Link Dist (ft)		1214		250	183	717
Turn Bay Length (ft)	100		100			
Base Capacity (vph)	658	1509	251	1523	607	629
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.71	0.06	0.37	0.10	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
619: NE Inglewood Hill Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+Improvements+OptimizTimings PM_Scenario 6

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	120	234	207	235	238	136	172	708	405	253	634
v/c Ratio	0.34	0.63	0.34	0.64	0.62	0.20	0.69	0.80	0.67	0.99	0.71
Control Delay	29.7	36.4	9.3	35.9	34.3	2.4	49.5	35.6	14.3	92.7	31.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	36.4	9.3	35.9	34.3	2.4	49.5	35.6	14.3	92.7	31.5
Queue Length 50th (ft)	49	102	26	107	107	0	79	164	40	~127	141
Queue Length 95th (ft)	100	183	74	189	189	15	#190	#288	150	#304	#233
Internal Link Dist (ft)	1400			557			590			212	
Turn Bay Length (ft)	200		200	200		200	200		100	200	
Base Capacity (vph)	449	473	623	502	525	668	257	936	621	255	920
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.49	0.33	0.47	0.45	0.20	0.67	0.76	0.65	0.99	0.69

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.

Queues
616: SE 8th St. & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+Improvements+OptimizTimings PM_Scenario 6



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	150	173	196	122	209	1125	54	915
v/c Ratio	0.29	0.26	0.43	0.17	0.62	0.77	0.19	0.80
Control Delay	15.2	8.9	18.6	3.3	24.7	27.1	14.4	30.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	8.9	18.6	3.3	24.7	27.1	14.4	30.5
Queue Length 50th (ft)	46	28	66	0	52	255	12	200
Queue Length 95th (ft)	71	51	104	21	#170	#477	38	#361
Internal Link Dist (ft)	203		121			879		601
Turn Bay Length (ft)		25			100		100	
Base Capacity (vph)	780	962	455	701	338	1459	295	1325
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	0.19	0.18	0.43	0.17	0.62	0.77	0.18	0.69

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
650: SE 20th Street & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+Improvements+OptimizTimings PM_Scenario 6



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT
Lane Group Flow (vph)	46	256	193	1195	1	980
v/c Ratio	0.27	0.67	0.61	0.42	0.01	0.45
Control Delay	48.3	14.6	49.3	3.9	48.0	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	14.6	49.3	3.9	48.0	12.0
Queue Length 50th (ft)	31	0	127	66	1	163
Queue Length 95th (ft)	63	74	190	231	6	287
Internal Link Dist (ft)	1577			559		368
Turn Bay Length (ft)		100	150		150	
Base Capacity (vph)	431	573	384	2856	126	2190
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.45	0.50	0.42	0.01	0.45
Intersection Summary						

Queues
651: SE 24th St & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+Improvements+OptimizTimings PM_Scenario 6



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	12	7	131	250	8	1245	234	354	956
v/c Ratio	0.09	0.06	0.54	0.59	0.06	0.99	0.26	0.55	0.38
Control Delay	48.2	27.0	51.6	11.0	48.0	59.2	2.0	33.2	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.2	27.0	51.6	11.0	48.0	59.2	2.0	33.2	8.5
Queue Length 50th (ft)	8	0	88	0	5	388	0	209	77
Queue Length 95th (ft)	20	9	127	47	21	#726	29	296	272
Internal Link Dist (ft)	176		180			717			443
Turn Bay Length (ft)		80			180		320	300	
Base Capacity (vph)	483	425	410	549	157	1255	1042	641	2520
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.02	0.32	0.46	0.05	0.99	0.22	0.55	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
653: Issaquah-Pine Lk Rd & 228th Ave SE

Sammamish 228th Ave Corridor Analysis
2020 Vol+Improvements+OptimizTimings PM_Scenario 6



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	229	175	176	323	303	41	719	211	551	414
v/c Ratio	0.82	0.39	0.61	0.85	0.78	0.42	0.78	0.38	0.99	0.30
Control Delay	71.4	35.4	55.6	62.9	54.7	71.1	46.6	6.9	86.2	27.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.4	35.4	55.6	62.9	54.7	71.1	46.6	6.9	86.2	27.2
Queue Length 50th (ft)	171	98	129	252	230	31	270	0	~246	124
Queue Length 95th (ft)	#314	181	209	383	354	74	367	60	#398	182
Internal Link Dist (ft)		264		438			338			265
Turn Bay Length (ft)	100		300			125			300	
Base Capacity (vph)	337	514	448	507	506	108	1105	627	554	1401
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.34	0.39	0.64	0.60	0.38	0.65	0.34	0.99	0.30

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.

APPENDIX D – 2011 AND 2020 ROUNDABOUT LOS AND QUEUE CALCULATIONS

MOVEMENT SUMMARY

Site: Sahalee Way and NE 28th
PI_2011 AM

Sahalee Way and NE 28th PI_2011 AM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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 East: Sahalee Way (NWB)											
3X	L	4	0.0	0.955	38.7	LOS E	30.2	754.1	1.00	0.83	16.0
8X	T	957	0.0	0.955	38.7	LOS E	30.2	754.1	1.00	0.83	16.2
18X	R	1	0.0	0.955	38.7	LOS E	30.2	754.1	1.00	0.83	16.2
Approach		963	0.0	0.955	38.7	LOS E	30.2	754.1	1.00	0.83	16.2
North East: NE 28th PI (SWB)											
1X	L	6	0.0	0.065	10.2	LOS B	0.2	5.1	0.67	0.92	10.5
6X	T	1	0.0	0.065	10.2	LOS B	0.2	5.1	0.67	0.72	10.2
16X	R	18	0.0	0.065	10.2	LOS B	0.2	5.1	0.67	0.77	10.1
Approach		25	0.0	0.065	10.2	LOS B	0.2	5.1	0.67	0.80	10.2
North West: Sahalee Way (SEB)											
7X	L	6	2.0	0.353	6.8	LOS A	1.8	45.0	0.09	0.91	24.4
4X	T	351	2.0	0.353	6.8	LOS A	1.8	45.0	0.09	0.40	26.9
14X	R	30	2.0	0.353	6.8	LOS A	1.8	45.0	0.09	0.54	26.3
Approach		386	2.0	0.353	6.8	LOS A	1.8	45.0	0.09	0.42	26.8
South West: NE 28th PI (NEB)											
5X	L	107	0.0	0.158	6.3	LOS A	0.6	14.5	0.45	0.73	12.7
2X	T	1	0.0	0.158	6.3	LOS A	0.6	14.5	0.45	0.45	13.4
12X	R	15	0.0	0.158	6.3	LOS A	0.6	14.5	0.45	0.54	13.0
Approach		123	0.0	0.158	6.3	LOS A	0.6	14.5	0.45	0.70	12.7
All Vehicles		1498	0.5	0.955	27.3	LOS D	30.2	754.1	0.71	0.71	18.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

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MOVEMENT SUMMARY

Site: 228th Ave SE and NE 8th St_2011 AM

228th Ave SE and NE 8th St _2011 AM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	237	3.0	0.576	13.2	LOS B	2.9	73.2	0.56	0.98	23.5
8T	T	601	3.0	0.576	13.1	LOS B	2.9	73.2	0.55	0.78	23.7
8R	R	103	1.0	0.576	13.0	LOS B	2.7	69.9	0.54	0.84	23.5
Approach		941	2.8	0.576	13.1	LOS B	2.9	73.2	0.55	0.84	23.6
East: NE 8th St (WB)											
1L	L	399	4.0	0.731	26.1	LOS D	3.6	93.2	0.77	1.06	10.1
6T	T	200	4.0	0.735	27.5	LOS D	3.8	97.2	0.79	1.08	10.9
6R	R	182	4.0	0.735	27.5	LOS D	3.8	97.2	0.79	1.03	9.1
Approach		780	4.0	0.735	26.8	LOS D	3.8	97.2	0.78	1.06	10.1
North: 228th Ave SE (SB)											
7L	L	113	1.0	0.829	33.5	LOS D	5.7	145.1	0.83	1.18	11.4
4T	T	813	2.0	0.829	33.0	LOS D	5.7	145.1	0.82	1.10	11.5
4R	R	54	3.0	0.829	32.5	LOS D	5.5	140.5	0.82	1.09	11.6
Approach		980	1.9	0.829	33.0	LOS D	5.7	145.1	0.82	1.11	11.5
South West: NE Inglewood Hill Rd (EB)											
5X	L	116	4.0	0.851	48.1	LOS E	4.8	124.1	0.91	1.24	9.8
2X	T	169	4.0	0.851	48.1	LOS E	4.8	124.1	0.91	1.20	9.6
12X	R	407	4.0	0.851	46.0	LOS E	4.8	124.1	0.90	1.20	7.6
Approach		691	4.0	0.851	46.9	LOS E	4.8	124.1	0.90	1.21	8.5
All Vehicles		3392	3.1	0.851	28.9	LOS D	5.7	145.1	0.75	1.04	13.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

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MOVEMENT SUMMARY

Site: 228th Ave SE and SE 8th St-
2011 AM

228th Ave SE and SE 8th St_2011 AM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	51	3.0	0.544	10.4	LOS B	3.5	88.6	0.34	0.84	16.1
8T	T	944	3.0	0.544	10.4	LOS B	3.5	88.6	0.34	0.48	18.1
8R	R	107	3.0	0.544	10.4	LOS B	3.5	88.6	0.34	0.59	17.1
Approach		1103	3.0	0.544	10.4	LOS B	3.5	88.6	0.34	0.51	17.9
East: SE 8th St (WB)											
1L	L	268	1.0	0.522	16.3	LOS C	2.0	49.5	0.69	0.97	10.5
6T	T	14	1.0	0.522	16.3	LOS C	2.0	49.5	0.69	0.82	10.1
6R	R	196	1.0	0.382	13.2	LOS B	1.3	32.1	0.66	0.84	11.2
Approach		477	1.0	0.522	15.1	LOS C	2.0	49.5	0.68	0.91	10.7
North: 228th Ave SE (SB)											
7L	L	58	4.0	0.525	12.3	LOS B	2.9	75.2	0.60	0.97	15.5
4T	T	731	4.0	0.525	12.3	LOS B	2.9	75.2	0.60	0.77	16.9
4R	R	25	4.0	0.525	12.3	LOS B	2.9	75.2	0.60	0.84	16.3
Approach		815	4.0	0.525	12.3	LOS B	2.9	75.2	0.60	0.79	16.8
West: SE 8th St (EB)											
5L	L	15	0.0	0.038	7.7	LOS A	0.1	2.4	0.57	0.88	13.7
2T	T	4	0.0	0.038	7.7	LOS A	0.1	2.4	0.57	0.66	14.4
2R	R	29	0.0	0.056	7.5	LOS A	0.1	3.5	0.55	0.72	14.4
Approach		48	0.0	0.056	7.6	LOS A	0.1	3.5	0.56	0.77	14.1
All Vehicles		2443	2.9	0.544	11.9	LOS B	3.5	88.6	0.50	0.69	15.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

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MOVEMENT SUMMARY

Site: 228th Ave SE and SE 20th St-
2011 AM

228th Ave SE and SE 20th St_2011 AM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	143	4.0	0.725	17.0	LOS C	6.6	170.6	0.64	0.84	16.5
8T	T	1200	4.0	0.725	17.0	LOS C	6.6	170.6	0.64	0.66	17.6
Approach		1343	4.0	0.725	17.0	LOS C	6.6	170.6	0.64	0.68	17.5
North: 228th Ave SE (SB)											
7L	L	1	4.0	0.638	13.5	LOS B	4.4	113.0	0.53	0.89	17.7
4T	T	1148	4.0	0.638	13.5	LOS B	4.4	113.0	0.53	0.60	19.3
4R	R	45	4.0	0.638	13.5	LOS B	4.4	113.0	0.53	0.67	18.8
Approach		1194	4.0	0.638	13.5	LOS B	4.4	113.0	0.53	0.60	19.3
West: SE 8th St (EB)											
5L	L	155	2.0	0.326	12.8	LOS B	1.0	24.4	0.66	0.91	20.4
2R	R	100	2.0	0.223	11.4	LOS B	0.6	15.6	0.65	0.79	12.2
Approach		255	2.0	0.326	12.3	LOS B	1.0	24.4	0.66	0.86	18.8
All Vehicles		2793	3.8	0.725	15.1	LOS C	6.6	170.6	0.59	0.66	18.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

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MOVEMENT SUMMARY

Site: 228th Ave SE and SE 24th St_2011 AM

228th Ave SE and SE 24th St_2011 AM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	4	4.0	0.518	10.5	LOS B	2.9	74.9	0.44	0.87	18.4
8T	T	963	4.0	0.518	10.5	LOS B	2.9	74.9	0.44	0.56	20.3
8R	R	91	4.0	0.096	4.7	LOS A	0.3	8.6	0.26	0.54	21.5
Approach		1058	4.0	0.518	10.0	LOS B	2.9	74.9	0.42	0.56	20.4
East: SE 24th St (WB)											
1L	L	174	3.0	0.342	12.4	LOS B	1.1	27.5	0.63	0.88	10.7
6T	T	1	3.0	0.342	12.4	LOS B	1.1	27.5	0.63	0.69	10.0
6R	R	326	3.0	0.606	19.5	LOS C	2.5	63.6	0.72	0.91	7.9
Approach		501	3.0	0.606	17.0	LOS C	2.5	63.6	0.69	0.90	8.9
North: 228th Ave SE (SB)											
7L	L	136	4.0	0.797	21.6	LOS C	9.3	239.7	0.77	0.89	15.2
4T	T	1301	4.0	0.797	21.6	LOS C	9.3	239.7	0.77	0.78	15.8
4R	R	4	4.0	0.797	21.6	LOS C	9.3	239.7	0.77	0.82	15.6
Approach		1441	4.0	0.797	21.6	LOS C	9.3	239.7	0.77	0.79	15.7
West: SE 24th St (EB)											
5L	L	7	0.0	0.027	10.7	LOS B	0.1	1.7	0.70	0.87	10.7
2T	T	2	0.0	0.027	10.7	LOS B	0.1	1.7	0.70	0.70	8.1
2R	R	5	0.0	0.015	11.4	LOS B	0.0	0.9	0.72	0.72	5.2
Approach		14	0.0	0.027	10.9	LOS B	0.1	1.7	0.70	0.79	9.0
All Vehicles		3015	3.8	0.797	16.7	LOS C	9.3	239.7	0.64	0.73	16.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

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MOVEMENT SUMMARY

Site: 228th Ave SE and Issaquah
Pine Lake Rd SE_2011 AM

228th Ave SE and Issaquah Pine Lake Rd SE_2011 AM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	28	6.0	0.281	9.8	LOS A	1.0	26.2	0.58	0.98	17.2
8T	T	308	6.0	0.281	9.8	LOS A	1.0	26.2	0.58	0.77	18.9
8R	R	75	6.0	0.115	6.8	LOS A	0.4	9.9	0.49	0.72	20.3
Approach		411	6.0	0.281	9.2	LOS A	1.0	26.2	0.56	0.77	19.0
East: Issaquah Pine Lake Rd SE (WB)											
1L	L	162	6.0	0.333	8.7	LOS A	1.0	27.3	0.45	0.88	20.4
6T	T	92	6.0	0.333	8.7	LOS A	1.0	27.3	0.45	0.62	22.4
6R	R	430	6.0	0.551	12.9	LOS B	2.3	61.5	0.53	0.80	19.7
Approach		684	6.0	0.551	11.3	LOS B	2.3	61.5	0.50	0.79	20.2
North: 228th Ave SE (SB)											
7L	L	349	4.0	0.715	18.4	LOS C	6.1	157.2	0.74	0.98	14.3
4T	T	771	4.0	0.715	18.4	LOS C	6.1	157.2	0.74	0.88	15.0
4R	R	31	4.0	0.715	18.4	LOS C	6.1	157.2	0.74	0.92	14.8
Approach		1152	4.0	0.715	18.4	LOS C	6.1	157.2	0.74	0.91	14.8
West: Issaquah Pine Lake Rd SE (EB)											
5L	L	83	4.0	0.484	18.5	LOS C	1.6	40.8	0.74	1.04	11.3
2T	T	123	4.0	0.484	18.5	LOS C	1.6	40.8	0.74	0.85	10.8
2R	R	52	4.0	0.129	11.0	LOS B	0.3	8.5	0.66	0.75	13.6
Approach		258	4.0	0.484	17.0	LOS C	1.6	40.8	0.73	0.89	11.4
All Vehicles		2505	4.9	0.715	14.8	LOS B	6.1	157.2	0.64	0.85	16.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

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MOVEMENT SUMMARY

Site: Sahalee Way and NE 28th
PI_2011 PM

Sahalee Way and NE 28th PI_2011 PM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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 East: Sahalee Way (NWB)											
3X	L	11	0.0	0.509	9.3	LOS A	3.3	83.1	0.25	0.85	23.5
8X	T	519	0.0	0.509	9.3	LOS A	3.3	83.1	0.25	0.43	25.6
18X	R	18	0.0	0.509	9.3	LOS A	3.3	83.1	0.25	0.54	25.1
Approach		549	0.0	0.509	9.3	LOS A	3.3	83.1	0.25	0.44	25.5
North East: NE 28th PI (SWB)											
1X	L	14	0.0	0.044	6.1	LOS A	0.1	3.6	0.50	0.79	12.3
6X	T	3	0.0	0.044	6.1	LOS A	0.1	3.6	0.50	0.50	12.8
16X	R	11	0.0	0.044	6.1	LOS A	0.1	3.6	0.50	0.58	12.4
Approach		28	0.0	0.044	6.1	LOS A	0.1	3.6	0.50	0.67	12.4
North West: Sahalee Way (SEB)											
7X	L	12	0.0	0.830	21.0	LOS C	14.4	360.0	0.50	0.68	19.7
4X	T	816	0.0	0.830	21.0	LOS C	14.4	360.0	0.50	0.40	20.8
14X	R	82	0.0	0.830	21.0	LOS C	14.4	360.0	0.50	0.48	20.5
Approach		911	0.0	0.830	21.0	LOS C	14.4	360.0	0.50	0.41	20.7
South West: NE 28th PI (NEB)											
5X	L	31	0.0	0.107	8.8	LOS A	0.4	8.8	0.60	0.87	11.6
2X	T	3	0.0	0.107	8.8	LOS A	0.4	8.8	0.60	0.65	11.7
12X	R	18	0.0	0.107	8.8	LOS A	0.4	8.8	0.60	0.71	11.5
Approach		52	0.0	0.107	8.8	LOS A	0.4	8.8	0.60	0.80	11.6
All Vehicles		1540	0.0	0.830	16.1	LOS C	14.4	360.0	0.41	0.44	22.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

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SIDRA INTERSECTION 5.1.13.2093

Project: P:\c\COSA00000013\0600INFO\TT\605TT Planning\615TT Analysis\aaSidra\2011 PM 228th Corridor

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INTERSECTION

MOVEMENT SUMMARY

Site: 228th Ave SE and NE 8th St_2011PM

228th Ave SE and NE 8th St _2011 PM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	2	2.0	0.439	10.5	LOS B	1.7	43.6	0.52	1.05	23.8
8T	T	532	1.0	0.439	10.4	LOS B	1.7	43.6	0.51	0.76	25.2
8R	R	149	1.0	0.439	10.3	LOS B	1.6	41.5	0.50	0.80	24.8
Approach		683	1.0	0.439	10.4	LOS B	1.7	43.6	0.51	0.77	25.1
East: NE 8th St (WB)											
1L	L	181	0.0	0.250	7.9	LOS A	0.7	18.1	0.46	0.83	15.7
6T	T	1	3.0	0.228	7.8	LOS A	0.7	17.1	0.48	0.90	17.6
6R	R	159	0.0	0.228	7.8	LOS A	0.7	17.1	0.48	0.73	16.5
Approach		341	0.0	0.250	7.8	LOS A	0.7	18.1	0.47	0.78	16.0
North: 228th Ave SE (SB)											
7L	L	180	1.0	0.365	7.6	LOS A	1.3	33.9	0.31	0.81	19.1
4T	T	533	1.0	0.365	7.6	LOS A	1.3	33.9	0.30	0.54	21.6
4R	R	1	3.0	0.365	7.6	LOS A	1.3	32.0	0.30	0.54	21.7
Approach		714	1.0	0.365	7.6	LOS A	1.3	33.9	0.31	0.60	20.8
South West: NE Inglewood Hill Rd (EB)											
5X	L	93	0.0	0.539	15.5	LOS C	2.2	54.5	0.66	1.01	16.9
2X	T	225	0.0	0.539	15.5	LOS C	2.2	54.5	0.66	0.86	17.8
12X	R	316	0.0	0.539	16.1	LOS C	2.3	56.4	0.68	0.93	13.9
Approach		634	0.0	0.539	15.8	LOS C	2.3	56.4	0.67	0.92	15.8
All Vehicles		2372	0.6	0.539	10.6	LOS B	2.3	56.4	0.48	0.76	20.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

Processed: Monday, January 09, 2012 10:58:54 AM

SIDRA INTERSECTION 5.1.13.2093

Project: P:\c\COSA00000013\0600INFO\TT\605TT Planning\615TT Analysis\aaSidra\2011 PM 228th Corridor

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MOVEMENT SUMMARY

Site: 228th Ave SE and SE 8th St-
2011 PM

228th Ave SE and SE 8th St_2011 PM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	47	1.0	0.699	16.5	LOS C	6.3	157.8	0.71	0.95	14.0
8T	T	917	1.0	0.699	16.5	LOS C	6.3	157.8	0.71	0.79	14.9
8R	R	269	1.0	0.699	16.5	LOS C	6.3	157.8	0.71	0.83	14.3
Approach		1232	1.0	0.699	16.5	LOS C	6.3	157.8	0.71	0.80	14.7
East: SE 8th St (WB)											
1L	L	179	2.0	0.353	12.0	LOS B	1.1	27.6	0.62	0.90	11.8
6T	T	11	2.0	0.353	12.0	LOS B	1.1	27.6	0.62	0.73	11.9
6R	R	118	2.0	0.231	10.3	LOS B	0.6	16.5	0.60	0.76	12.6
Approach		309	2.0	0.353	11.4	LOS B	1.1	27.6	0.61	0.84	12.1
North: 228th Ave SE (SB)											
7L	L	162	1.0	0.612	13.4	LOS B	4.4	110.4	0.62	0.90	15.0
4T	T	881	1.0	0.612	13.4	LOS B	4.4	110.4	0.62	0.72	16.3
4R	R	34	1.0	0.612	13.4	LOS B	4.4	110.4	0.62	0.79	15.7
Approach		1077	1.0	0.612	13.4	LOS B	4.4	110.4	0.62	0.75	16.0
West: SE 8th St (EB)											
5L	L	54	0.0	0.159	9.8	LOS A	0.4	10.4	0.62	0.90	12.8
2T	T	22	0.0	0.159	9.8	LOS A	0.4	10.4	0.62	0.70	13.1
2R	R	21	0.0	0.046	8.7	LOS A	0.1	3.0	0.62	0.76	13.7
Approach		96	0.0	0.159	9.6	LOS A	0.4	10.4	0.62	0.83	13.0
All Vehicles		2714	1.1	0.699	14.4	LOS B	6.3	157.8	0.66	0.79	14.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

Processed: Friday, January 06, 2012 3:26:31 PM

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Project: P:\c\COSA00000013\0600INFO\TT\605TT Planning\615TT Analysis\aaSidra\2011 PM 228th Corridor

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MOVEMENT SUMMARY

Site: 228th Ave SE and SE 20th St-
2011PM

228th Ave SE and SE 20th St_2011 PM
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)												
3L	L	123	1.0	0.661	13.2	LOS B	5.6	141.5	0.42	0.79	17.8	
8T	T	1253	1.0	0.661	13.2	LOS B	5.6	141.5	0.42	0.49	19.5	
Approach		1376	1.0	0.661	13.2	LOS B	5.6	141.5	0.42	0.52	19.3	
North: 228th Ave SE (SB)												
7L	L	2	1.0	0.601	12.0	LOS B	4.2	105.6	0.47	0.89	18.2	
4T	T	1107	1.0	0.601	12.0	LOS B	4.2	105.6	0.47	0.56	20.1	
4R	R	78	1.0	0.601	12.0	LOS B	4.2	105.6	0.47	0.63	19.6	
Approach		1187	1.0	0.601	12.0	LOS B	4.2	105.6	0.47	0.56	20.1	
West: SE 8th St (EB)												
5L	L	70	0.0	0.145	9.4	LOS A	0.4	9.9	0.61	0.86	21.5	
2R	R	177	0.0	0.347	12.5	LOS B	1.1	26.9	0.65	0.82	11.7	
Approach		247	0.0	0.347	11.6	LOS B	1.1	26.9	0.64	0.83	16.4	
All Vehicles		2811	0.9	0.661	12.6	LOS B	5.6	141.5	0.46	0.56	19.4	

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

Processed: Wednesday, July 03, 2013 11:39:35 AM

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Project: P:\c\COSA00000013\0600INFO\TT\605TT Planning\615TT Analysis\aaSidra\2011 PM 228th Corridor

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MOVEMENT SUMMARY

Site: 228th Ave SE and SE 24th St_2011PM

228th Ave SE and SE 24th St_2011 PM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	10	1.0	0.825	26.4	LOS D	9.7	244.1	0.92	1.17	13.5
8T	T	1282	1.0	0.825	26.4	LOS D	9.7	244.1	0.92	1.12	13.6
8R	R	196	1.0	0.243	7.1	LOS A	1.0	24.2	0.46	0.68	19.5
Approach		1487	1.0	0.825	23.9	LOS C	9.7	244.1	0.86	1.06	14.1
East: SE 24th St (WB)											
1L	L	149	1.0	0.390	16.2	LOS C	1.3	31.5	0.74	0.96	9.6
6T	T	12	1.0	0.390	16.2	LOS C	1.3	31.5	0.74	0.81	8.6
6R	R	233	1.0	0.529	19.6	LOS C	1.9	47.2	0.76	0.93	7.8
Approach		394	1.0	0.529	18.2	LOS C	1.9	47.2	0.75	0.94	8.6
North: 228th Ave SE (SB)											
7L	L	334	1.0	0.791	20.5	LOS C	9.7	245.1	0.79	0.85	15.4
4T	T	1140	1.0	0.791	20.5	LOS C	9.7	245.1	0.79	0.76	16.1
4R	R	15	1.0	0.791	20.5	LOS C	9.7	245.1	0.79	0.79	16.0
Approach		1490	1.0	0.791	20.5	LOS C	9.7	245.1	0.79	0.78	15.9
West: SE 24th St (EB)											
5L	L	16	0.0	0.059	11.9	LOS B	0.1	3.7	0.72	0.88	10.3
2T	T	3	0.0	0.059	11.9	LOS B	0.1	3.7	0.72	0.72	7.7
2R	R	28	0.0	0.079	11.3	LOS B	0.2	4.9	0.70	0.70	5.2
Approach		48	0.0	0.079	11.5	LOS B	0.2	4.9	0.71	0.76	7.8
All Vehicles		3418	1.0	0.825	21.6	LOS C	9.7	245.1	0.82	0.92	14.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

Processed: Friday, January 06, 2012 3:27:14 PM

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Project: P:\c\COSA00000013\0600INFO\TT\605TT Planning\615TT Analysis\aaSidra\2011 PM 228th Corridor

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MOVEMENT SUMMARY

Site: 228th Ave SE and Issaquah
Pine Lake Rd SE_2011PM

228th Ave SE and Issaquah Pine Lake Rd SE_2011 PM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	29	1.0	0.745	26.3	LOS D	5.4	136.6	0.84	1.16	12.0
8T	T	816	1.0	0.745	26.3	LOS D	5.4	136.6	0.84	1.07	12.1
8R	R	183	1.0	0.295	9.7	LOS A	1.1	28.2	0.59	0.80	18.3
Approach		1028	1.0	0.745	23.4	LOS C	5.4	136.6	0.79	1.03	12.8
East: Issaquah Pine Lake Rd SE (WB)											
1L	L	106	1.0	0.380	12.4	LOS B	1.3	32.4	0.62	0.97	19.0
6T	T	103	1.0	0.380	12.4	LOS B	1.3	32.4	0.62	0.78	20.4
6R	R	487	1.0	0.843	35.2	LOS E	5.7	144.5	0.85	1.15	12.9
Approach		697	1.0	0.843	28.3	LOS D	5.7	144.5	0.78	1.07	14.4
North: 228th Ave SE (SB)											
7L	L	491	2.0	0.564	12.2	LOS B	3.5	89.6	0.57	0.81	16.3
4T	T	414	2.0	0.509	10.9	LOS B	2.8	71.1	0.53	0.66	18.8
4R	R	29	2.0	0.509	10.9	LOS B	2.8	71.1	0.53	0.73	18.3
Approach		934	2.0	0.564	11.6	LOS B	3.5	89.6	0.55	0.74	17.3
West: Issaquah Pine Lake Rd SE (EB)											
5L	L	85	5.0	0.326	11.8	LOS B	0.9	24.6	0.61	0.94	13.2
2T	T	85	5.0	0.326	11.8	LOS B	0.9	24.6	0.61	0.67	13.3
2R	R	14	5.0	0.028	7.6	LOS A	0.1	1.8	0.55	0.66	15.4
Approach		184	5.0	0.326	11.5	LOS B	0.9	24.6	0.60	0.79	13.4
All Vehicles		2843	1.6	0.843	19.9	LOS C	5.7	144.5	0.70	0.93	14.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

Processed: Friday, January 06, 2012 3:03:40 PM

SIDRA INTERSECTION 5.1.13.2093

Project: P:\c\COSA00000013\0600INFO\TT\605TT Planning\615TT Analysis\aaSidra\2011 PM 228th Corridor

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INTERSECTION

MOVEMENT SUMMARY

Site: Sahalee Way and NE 28th
PI_2020 AM

Sahalee Way and NE 28th PI_2020 AM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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 East: Sahalee Way (NWB)											
3X	L	1	0.0	1.005	50.0	LOS F	45.8	1144.2	1.00	1.05	14.1
8X	T	1001	0.0	1.005	50.0	LOS F	45.8	1144.2	1.00	1.05	14.2
18X	R	1	0.0	1.005	50.0	LOS F	45.8	1144.2	1.00	1.05	14.2
Approach		1003	0.0	1.005	50.0	LOS F	45.8	1144.2	1.00	1.05	14.2
North East: NE 28th PI (SWB)											
1X	L	7	0.0	0.078	10.9	LOS B	0.2	6.1	0.69	0.92	10.3
6X	T	1	0.0	0.078	10.9	LOS B	0.2	6.1	0.69	0.73	9.9
16X	R	20	0.0	0.078	10.9	LOS B	0.2	6.1	0.69	0.78	9.8
Approach		29	0.0	0.078	10.9	LOS B	0.2	6.1	0.69	0.82	9.9
North West: Sahalee Way (SEB)											
7X	L	6	2.0	0.421	7.8	LOS A	2.4	59.8	0.08	0.91	24.0
4X	T	419	2.0	0.421	7.8	LOS A	2.4	59.8	0.08	0.40	26.4
14X	R	38	2.0	0.421	7.8	LOS A	2.4	59.8	0.08	0.54	25.8
Approach		463	2.0	0.421	7.8	LOS A	2.4	59.8	0.08	0.42	26.3
South West: NE 28th PI (NEB)											
5X	L	116	0.0	0.186	7.0	LOS A	0.7	17.3	0.49	0.77	12.3
2X	T	1	0.0	0.186	7.0	LOS A	0.7	17.3	0.49	0.52	12.8
12X	R	18	0.0	0.186	7.0	LOS A	0.7	17.3	0.49	0.60	12.4
Approach		136	0.0	0.186	7.0	LOS A	0.7	17.3	0.49	0.75	12.3
All Vehicles		1630	0.6	1.005	33.8	LOS D	45.8	1144.2	0.69	0.84	16.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

Processed: Friday, January 06, 2012 4:53:16 PM

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Project: P:\c\COSA00000013\0600INFO\TT\605TT Planning\615TT Analysis\aaSidra\2020 AM 228th Corridor

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INTERSECTION

MOVEMENT SUMMARY

Site: 228th Ave SE and NE 8th St_2020 AM

228th Ave SE and NE 8th St _2020 AM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	171	3.0	0.804	25.0	LOS D	6.4	165.0	0.79	1.12	20.0
8T	T	800	3.0	0.804	24.8	LOS C	6.4	165.0	0.78	1.00	18.9
8R	R	280	1.0	0.804	24.4	LOS C	6.3	159.8	0.77	1.02	18.8
Approach		1251	2.6	0.804	24.7	LOS C	6.4	165.0	0.78	1.02	19.1
East: NE 8th St (WB)											
1L	L	488	4.0	1.070	92.3	LOS F	19.2	496.5	1.00	2.23	4.4
6T	T	487	4.0	1.327	185.3	LOS F	56.7	1463.4	1.00	3.94	2.7
6R	R	155	4.0	1.327	185.3	LOS F	56.7	1463.4	1.00	4.27	2.0
Approach		1130	4.0	1.327	145.1	LOS F	56.7	1463.4	1.00	3.25	3.1
North: 228th Ave SE (SB)											
7L	L	158	1.0	1.136	112.8	LOS F	28.6	724.8	1.00	2.57	5.0
4T	T	885	2.0	1.136	111.7	LOS F	29.5	750.9	1.00	2.60	4.7
4R	R	62	3.0	1.136	111.0	LOS F	29.5	750.9	1.00	2.63	4.7
Approach		1105	1.9	1.136	111.9	LOS F	29.5	750.9	1.00	2.60	4.7
South West: NE Inglewood Hill Rd (EB)											
5X	L	150	4.0	0.985	82.1	LOS F	8.3	213.5	0.98	1.57	6.8
2X	T	176	4.0	0.985	82.1	LOS F	8.3	213.5	0.98	1.56	6.5
12X	R	267	4.0	0.880	62.9	LOS F	4.7	121.7	0.94	1.28	6.0
Approach		593	4.0	0.985	73.4	LOS F	8.3	213.5	0.96	1.44	6.4
All Vehicles		4078	3.0	1.327	88.8	LOS F	56.7	1463.4	0.93	2.13	6.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

Processed: Monday, January 09, 2012 11:54:02 AM

SIDRA INTERSECTION 5.1.13.2093

Project: P:\c\COSA00000013\0600INFO\TT\605TT Planning\615TT Analysis\aaSidra\2020 AM 228th Corridor

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SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: 228th Ave SE and SE 8th St-
2020 AM

228th Ave SE and SE 8th St_2020 AM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	83	3.0	0.518	9.8	LOS A	3.2	82.3	0.28	0.83	16.3
8T	T	880	3.0	0.518	9.8	LOS A	3.2	82.3	0.28	0.46	18.5
8R	R	109	3.0	0.518	9.8	LOS A	3.2	82.3	0.28	0.57	17.5
Approach		1071	3.0	0.518	9.8	LOS A	3.2	82.3	0.28	0.50	18.2
East: SE 8th St (WB)											
1L	L	273	1.0	0.533	16.5	LOS C	2.0	51.4	0.69	0.97	10.4
6T	T	17	1.0	0.533	16.5	LOS C	2.0	51.4	0.69	0.83	10.0
6R	R	202	1.0	0.391	13.3	LOS B	1.3	33.2	0.65	0.84	11.2
Approach		492	1.0	0.533	15.2	LOS C	2.0	51.4	0.68	0.91	10.7
North: 228th Ave SE (SB)											
7L	L	20	4.0	0.516	12.5	LOS B	2.8	71.7	0.61	1.01	15.5
4T	T	662	4.0	0.516	12.5	LOS B	2.8	71.7	0.61	0.81	16.8
4R	R	85	4.0	0.516	12.5	LOS B	2.8	71.7	0.61	0.86	16.2
Approach		767	4.0	0.516	12.5	LOS B	2.8	71.7	0.61	0.82	16.7
West: SE 8th St (EB)											
5L	L	35	0.0	0.072	7.6	LOS A	0.2	4.8	0.54	0.85	13.7
2T	T	4	0.0	0.072	7.6	LOS A	0.2	4.8	0.54	0.64	14.4
2R	R	248	0.0	0.438	13.4	LOS B	1.5	38.3	0.64	0.83	11.3
Approach		287	0.0	0.438	12.6	LOS B	1.5	38.3	0.63	0.83	11.6
All Vehicles		2618	2.6	0.533	11.9	LOS B	3.2	82.3	0.49	0.71	15.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

Processed: Friday, January 06, 2012 4:53:17 PM

SIDRA INTERSECTION 5.1.13.2093

Project: P:\c\COSA00000013\0600INFO\TT\605TT Planning\615TT Analysis\aaSidra\2020 AM 228th Corridor

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INTERSECTION

MOVEMENT SUMMARY

Site: 228th Ave SE and SE 20th St-
2020 AM

228th Ave SE and SE 20th St_2020 AM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	228	4.0	0.702	15.4	LOS C	5.7	148.2	0.52	0.76	17.0
8T	T	1143	4.0	0.702	15.4	LOS C	5.7	148.2	0.52	0.54	18.3
Approach		1371	4.0	0.702	15.4	LOS C	5.7	148.2	0.52	0.58	18.1
North: 228th Ave SE (SB)											
7L	L	1	4.0	0.572	12.5	LOS B	3.5	90.8	0.56	0.97	18.1
4T	T	932	4.0	0.572	12.5	LOS B	3.5	90.8	0.56	0.69	19.8
4R	R	48	4.0	0.572	12.5	LOS B	3.5	90.8	0.56	0.76	19.3
Approach		980	4.0	0.572	12.5	LOS B	3.5	90.8	0.56	0.69	19.8
West: SE 8th St (EB)											
5L	L	103	2.0	0.193	9.3	LOS A	0.5	13.6	0.57	0.85	21.5
2R	R	145	2.0	0.258	9.9	LOS A	0.7	18.2	0.57	0.74	12.9
Approach		248	2.0	0.258	9.7	LOS A	0.7	18.2	0.57	0.78	18.5
All Vehicles		2599	3.8	0.702	13.7	LOS B	5.7	148.2	0.54	0.64	18.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

Processed: Wednesday, July 03, 2013 11:40:20 AM

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Project: P:\c\COSA00000013\0600INFO\TT\605TT Planning\615TT Analysis\aaSidra\2020 AM 228th Corridor

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INTERSECTION

MOVEMENT SUMMARY

Site: 228th Ave SE and SE 24th St_2020 AM

228th Ave SE and SE 24th St_2020 AM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	3	4.0	0.504	10.3	LOS B	2.8	71.4	0.44	0.88	18.5
8T	T	936	4.0	0.504	10.3	LOS B	2.8	71.4	0.44	0.57	20.5
8R	R	108	4.0	0.115	4.9	LOS A	0.4	10.6	0.28	0.55	21.3
Approach		1046	4.0	0.504	9.7	LOS A	2.8	71.4	0.42	0.56	20.6
East: SE 24th St (WB)											
1L	L	152	3.0	0.292	11.1	LOS B	0.9	22.3	0.60	0.85	11.1
6T	T	1	3.0	0.292	11.1	LOS B	0.9	22.3	0.60	0.64	10.6
6R	R	350	3.0	0.634	20.3	LOS C	2.7	69.8	0.72	0.92	7.7
Approach		504	3.0	0.634	17.5	LOS C	2.7	69.8	0.68	0.90	8.7
North: 228th Ave SE (SB)											
7L	L	143	4.0	0.664	14.6	LOS B	5.0	129.5	0.57	0.83	17.4
4T	T	1085	4.0	0.664	14.6	LOS B	5.0	129.5	0.57	0.63	18.7
4R	R	1	4.0	0.664	14.6	LOS B	5.0	129.5	0.57	0.70	18.3
Approach		1229	4.0	0.664	14.6	LOS B	5.0	129.5	0.57	0.65	18.5
West: SE 24th St (EB)											
5L	L	5	0.0	0.017	8.9	LOS A	0.0	1.1	0.64	0.84	11.4
2T	T	2	0.0	0.017	8.9	LOS A	0.0	1.1	0.64	0.64	8.7
2R	R	2	0.0	0.006	9.4	LOS A	0.0	0.4	0.66	0.62	5.8
Approach		10	0.0	0.017	9.1	LOS A	0.0	1.1	0.64	0.74	9.8
All Vehicles		2788	3.8	0.664	13.2	LOS B	5.0	129.5	0.53	0.66	17.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

Processed: Friday, January 06, 2012 4:53:18 PM

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Project: P:\c\COSA00000013\0600\INFO\TT\605TT Planning\615TT Analysis\aaSidra\2020 AM 228th Corridor

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INTERSECTION

MOVEMENT SUMMARY

Site: 228th Ave SE and Issaquah
Pine Lake Rd SE_2020 AM

228th Ave SE and Issaquah Pine Lake Rd SE_2020 AM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	42	6.0	0.232	17.2	LOS B	1.3	33.3	0.74	0.94	20.1
8T	T	272	6.0	0.232	10.0	LOS B	1.4	35.4	0.74	0.81	22.7
8R	R	86	6.0	0.102	9.0	LOS A	0.6	15.1	0.64	0.69	23.1
Approach		400	6.0	0.232	10.6	LOS B	1.4	35.4	0.72	0.80	22.4
East: Issaquah Pine Lake Rd SE (WB)											
1L	L	268	6.0	0.558	16.5	LOS B	4.1	107.7	0.78	1.02	21.9
6T	T	123	6.0	0.558	10.1	LOS B	4.1	107.7	0.78	0.92	23.8
6R	R	431	6.0	0.605	11.9	LOS B	4.8	126.7	0.80	0.99	23.3
Approach		822	6.0	0.605	13.2	LOS B	4.8	126.7	0.79	0.99	22.9
North: 228th Ave SE (SB)											
7L	L	393	4.0	0.771	22.6	LOS C	10.1	260.0	0.96	1.11	17.4
4T	T	771	4.0	0.771	16.0	LOS B	10.1	260.2	0.96	1.09	19.0
4R	R	1	4.0	0.771	16.9	LOS B	10.1	260.2	0.96	1.09	19.0
Approach		1165	4.0	0.771	18.2	LOS B	10.1	260.2	0.96	1.10	18.4
West: Issaquah Pine Lake Rd SE (EB)											
5L	L	224	4.0	0.952	51.7	LOS D	10.4	268.0	0.99	1.64	6.9
2T	T	176	4.0	0.952	43.7	LOS D	11.3	291.2	0.99	1.66	6.4
2R	R	198	4.0	0.952	43.9	LOS D	11.3	291.2	1.00	1.67	6.5
Approach		598	4.0	0.952	46.8	LOS D	11.3	291.2	0.99	1.66	6.7
All Vehicles		2986	4.8	0.952	21.5	LOS C	11.3	291.2	0.89	1.14	16.1

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model used.

Processed: Friday, January 06, 2012 5:19:50 PM

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Project: P:\c\COSA00000013\0600INFO\TT\605TT Planning\615TT Analysis\aaSidra\2020 AM 228th Corridor

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SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: Sahalee Way and NE 28th
PI_2020 PM

Sahalee Way and NE 28th PI_2020 PM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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 East: Sahalee Way (NWB)											
3X	L	14	0.0	0.537	9.8	LOS A	3.7	92.2	0.27	0.84	23.3
8X	T	543	0.0	0.537	9.8	LOS A	3.7	92.2	0.27	0.43	25.3
18X	R	20	0.0	0.537	9.8	LOS A	3.7	92.2	0.27	0.54	24.8
Approach		577	0.0	0.537	9.8	LOS A	3.7	92.2	0.27	0.44	25.2
North East: NE 28th PI (SWB)											
1X	L	16	0.0	0.050	6.3	LOS A	0.2	4.1	0.51	0.80	12.1
6X	T	3	0.0	0.050	6.3	LOS A	0.2	4.1	0.51	0.52	12.6
16X	R	13	0.0	0.050	6.3	LOS A	0.2	4.1	0.51	0.60	12.3
Approach		31	0.0	0.050	6.3	LOS A	0.2	4.1	0.51	0.69	12.2
North West: Sahalee Way (SEB)											
7X	L	13	0.0	0.997	46.1	LOS E	106.2	2654.9	1.00	0.45	14.7
4X	T	975	0.0	0.997	46.1	LOS E	106.2	2654.9	1.00	0.45	14.8
14X	R	103	0.0	0.997	46.1	LOS E	106.2	2654.9	1.00	0.45	14.8
Approach		1091	0.0	0.997	46.1	LOS E	106.2	2654.9	1.00	0.45	14.8
South West: NE 28th PI (NEB)											
5X	L	34	0.0	0.139	10.8	LOS B	0.5	11.3	0.67	0.89	10.9
2X	T	3	0.0	0.139	10.8	LOS B	0.5	11.3	0.67	0.71	10.7
12X	R	21	0.0	0.139	10.8	LOS B	0.5	11.3	0.67	0.76	10.5
Approach		58	0.0	0.139	10.8	LOS B	0.5	11.3	0.67	0.84	10.7
All Vehicles		1757	0.0	0.997	32.4	LOS D	106.2	2654.9	0.74	0.47	17.2

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

Processed: Friday, January 06, 2012 3:49:22 PM

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Project: P:\c\COSA00000013\0600INFO\TT\605TT Planning\615TT Analysis\aaSidra\2020 PM 228th Corridor

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SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: 228th Ave SE and NE 8th St_2020PM

228th Ave SE and NE 8th St _2020 PM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	173	3.0	0.898	37.6	LOS E	9.3	235.9	0.92	1.26	17.1
8T	T	708	1.0	0.898	37.3	LOS E	9.3	235.9	0.91	1.21	15.5
8R	R	405	1.0	0.898	36.7	LOS E	9.1	229.6	0.91	1.21	15.5
Approach		1286	1.3	0.898	37.2	LOS E	9.3	235.9	0.91	1.22	15.8
East: NE 8th St (WB)											
1L	L	357	0.0	0.642	20.6	LOS C	2.9	72.2	0.74	1.02	11.3
6T	T	114	3.0	0.480	15.5	LOS C	1.8	45.0	0.68	0.98	14.2
6R	R	136	0.0	0.480	15.5	LOS C	1.8	45.0	0.68	0.89	12.4
Approach		606	0.6	0.642	18.5	LOS C	2.9	72.2	0.72	0.98	12.0
North: 228th Ave SE (SB)											
7L	L	254	1.0	0.637	17.2	LOS C	3.3	83.8	0.68	1.02	15.3
4T	T	580	1.0	0.637	16.9	LOS C	3.3	83.8	0.66	0.88	16.2
4R	R	53	3.0	0.637	16.8	LOS C	3.2	80.4	0.66	0.88	16.4
Approach		887	1.1	0.637	17.0	LOS C	3.3	83.8	0.67	0.92	15.9
South West: NE Inglewood Hill Rd (EB)											
5X	L	121	0.0	0.728	28.3	LOS D	3.5	87.4	0.83	1.10	13.2
2X	T	234	0.0	0.728	28.3	LOS D	3.5	87.4	0.83	1.03	13.3
12X	R	207	0.0	0.450	16.3	LOS C	1.6	39.5	0.73	0.94	13.8
Approach		562	0.0	0.728	23.9	LOS C	3.5	87.4	0.79	1.01	13.4
All Vehicles		3341	0.9	0.898	26.2	LOS D	9.3	235.9	0.79	1.06	14.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

Processed: Monday, January 09, 2012 11:54:13 AM

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Project: P:\c\COSA00000013\0600INFO\TT\605TT Planning\615TT Analysis\aaSidra\2020 PM 228th Corridor

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SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: 228th Ave SE and SE 8th St-
2020PM

228th Ave SE and SE 8th St_2020 PM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	209	1.0	0.732	17.6	LOS C	7.3	183.9	0.72	0.91	13.7
8T	T	854	1.0	0.732	17.6	LOS C	7.3	183.9	0.72	0.76	14.4
8R	R	271	1.0	0.732	17.6	LOS C	7.3	183.9	0.72	0.80	13.9
Approach		1334	1.0	0.732	17.6	LOS C	7.3	183.9	0.72	0.79	14.1
East: SE 8th St (WB)											
1L	L	183	2.0	0.412	14.8	LOS B	1.3	33.4	0.69	0.95	10.9
6T	T	13	2.0	0.412	14.8	LOS B	1.3	33.4	0.69	0.80	10.7
6R	R	122	2.0	0.271	12.3	LOS B	0.8	19.9	0.67	0.82	11.6
Approach		318	2.0	0.412	13.8	LOS B	1.3	33.4	0.68	0.89	11.1
North: 228th Ave SE (SB)											
7L	L	54	1.0	0.654	16.8	LOS C	4.7	119.5	0.74	1.07	14.0
4T	T	797	1.0	0.654	16.8	LOS C	4.7	119.5	0.74	0.93	14.7
4R	R	118	1.0	0.654	16.8	LOS C	4.7	119.5	0.74	0.97	14.2
Approach		969	1.0	0.654	16.8	LOS C	4.7	119.5	0.74	0.95	14.6
West: SE 8th St (EB)											
5L	L	128	0.0	0.322	13.0	LOS B	1.0	25.1	0.68	0.93	11.6
2T	T	22	0.0	0.322	13.0	LOS B	1.0	25.1	0.68	0.78	11.4
2R	R	173	0.0	0.350	12.9	LOS B	1.1	27.1	0.66	0.83	11.5
Approach		323	0.0	0.350	12.9	LOS B	1.1	27.1	0.67	0.87	11.5
All Vehicles		2945	1.0	0.732	16.4	LOS C	7.3	183.9	0.72	0.86	13.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

Processed: Friday, January 06, 2012 3:49:01 PM

SIDRA INTERSECTION 5.1.13.2093

Project: P:\c\COSA00000013\0600INFO\TT\605TT Planning\615TT Analysis\aaSidra\2020 PM 228th Corridor

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SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: 228th Ave SE and SE 20th St-
2020PM

228th Ave SE and SE 20th St_2020 PM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	193	1.0	0.650	12.7	LOS B	5.6	141.2	0.33	0.77	18.0
8T	T	1195	1.0	0.650	12.7	LOS B	5.6	141.2	0.33	0.45	19.8
Approach		1388	1.0	0.650	12.7	LOS B	5.6	141.2	0.33	0.49	19.5
North: 228th Ave SE (SB)											
7L	L	1	1.0	0.533	10.9	LOS B	3.1	78.1	0.51	0.93	18.7
4T	T	899	1.0	0.533	10.9	LOS B	3.1	78.1	0.51	0.62	20.7
4R	R	81	1.0	0.533	10.9	LOS B	3.1	78.1	0.51	0.69	20.2
Approach		981	1.0	0.533	10.9	LOS B	3.1	78.1	0.51	0.63	20.7
West: SE 8th St (EB)											
5L	L	46	0.0	0.081	7.3	LOS A	0.2	5.4	0.52	0.83	22.2
2R	R	256	0.0	0.428	12.6	LOS B	1.5	37.6	0.61	0.81	11.6
Approach		302	0.0	0.428	11.8	LOS B	1.5	37.6	0.59	0.81	14.7
All Vehicles		2671	0.9	0.650	11.9	LOS B	5.6	141.2	0.43	0.58	19.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

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Project: P:\c\COSA00000013\0600INFO\TT\605TT Planning\615TT Analysis\aaSidra\2020 PM 228th Corridor

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MOVEMENT SUMMARY

Site: 228th Ave SE and SE 24th St_2020PM

228th Ave SE and SE 24th St_2020 PM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	9	0.9	0.810	25.4	LOS D	9.0	226.2	0.90	1.16	13.7
8T	T	1245	1.0	0.810	25.4	LOS D	9.0	226.2	0.90	1.10	13.9
8R	R	234	1.0	0.299	8.1	LOS A	1.2	30.9	0.50	0.72	18.8
Approach		1487	1.0	0.810	22.6	LOS C	9.0	226.2	0.84	1.04	14.4
East: SE 24th St (WB)											
1L	L	130	1.0	0.306	13.6	LOS B	0.9	23.1	0.70	0.90	10.3
6T	T	1	1.0	0.306	13.6	LOS B	0.9	23.1	0.70	0.75	9.5
6R	R	250	1.0	0.546	19.6	LOS C	2.0	50.3	0.76	0.93	7.8
Approach		382	1.0	0.546	17.5	LOS C	2.0	50.3	0.74	0.92	8.7
North: 228th Ave SE (SB)											
7L	L	354	1.0	0.674	14.4	LOS B	5.5	137.8	0.58	0.77	17.3
4T	T	951	1.0	0.674	14.4	LOS B	5.5	137.9	0.58	0.60	18.8
4R	R	5	1.0	0.674	14.4	LOS B	5.5	137.9	0.58	0.67	18.4
Approach		1309	1.0	0.674	14.4	LOS B	5.5	137.9	0.58	0.65	18.3
West: SE 24th St (EB)											
5L	L	9	0.0	0.029	9.2	LOS A	0.1	1.8	0.64	0.85	11.3
2T	T	3	0.0	0.029	9.2	LOS A	0.1	1.8	0.64	0.64	8.6
2R	R	7	0.0	0.020	9.7	LOS A	0.0	1.2	0.67	0.67	5.7
Approach		19	0.0	0.029	9.4	LOS A	0.1	1.8	0.65	0.75	9.4
All Vehicles		3197	1.0	0.810	18.6	LOS C	9.0	226.2	0.72	0.86	15.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

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MOVEMENT SUMMARY

Site: 228th Ave SE and Issaquah
Pine Lake Rd SE_2020PM

228th Ave SE and Issaquah Pine Lake Rd SE_2020 PM
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: 228th Ave SE (NB)											
3L	L	42	1.0	0.669	21.9	LOS C	3.3	82.4	0.75	1.09	13.2
8T	T	719	1.0	0.669	21.5	LOS C	3.3	82.4	0.74	0.96	13.5
8R	R	211	1.0	0.306	9.0	LOS A	0.9	23.3	0.50	0.76	18.9
Approach		972	1.0	0.669	18.8	LOS C	3.3	82.4	0.69	0.92	14.4
East: Issaquah Pine Lake Rd SE (WB)											
1L	L	176	1.0	0.599	19.6	LOS C	2.6	65.0	0.74	1.04	16.6
6T	T	138	1.0	0.599	19.6	LOS C	2.6	65.0	0.74	0.92	17.2
6R	R	488	1.0	0.886	42.3	LOS E	6.7	168.7	0.89	1.25	11.6
Approach		802	1.0	0.886	33.4	LOS D	6.7	168.7	0.83	1.15	13.3
North: 228th Ave SE (SB)											
7L	L	552	2.0	0.641	14.5	LOS B	3.6	90.9	0.57	0.91	15.5
4T	T	414	2.0	0.491	10.7	LOS B	2.1	53.9	0.49	0.72	19.0
4R	R	1	2.0	0.491	10.7	LOS B	2.1	53.9	0.49	0.79	18.4
Approach		968	2.0	0.641	12.9	LOS B	3.6	90.9	0.53	0.83	16.7
West: Issaquah Pine Lake Rd SE (EB)											
5L	L	229	5.0	0.482	16.8	LOS C	1.6	41.7	0.70	0.95	11.6
2T	T	122	5.0	0.389	15.0	LOS B	1.2	31.8	0.69	0.77	12.3
2R	R	53	5.0	0.389	15.0	LOS B	1.2	31.8	0.69	0.84	12.2
Approach		404	5.0	0.482	16.0	LOS C	1.6	41.7	0.69	0.88	11.8
All Vehicles		3146	1.8	0.886	20.4	LOS C	6.7	168.7	0.68	0.94	14.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

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