

APPENDIX A

2010 – 2030 TRAFFIC

ANALYSIS



Northgate CTIP - 2010 and 2030 Traffic Analysis

DRAFT REPORT

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INTRODUCTION

This report assessed the traffic impacts associated with the overall development within the Northgate study area. Traffic forecasts were developed for the year 2010 and 2030, which established the baseline conditions. The City of Seattle provided the forecasting model, which included all land use and roadway network changes. Mirai Transportation, Planning and Engineering refined the Seattle model and validated it with the 2004 traffic counts for the Northgate Coordinated Transportation Investment Plan (CTIP) analysis area. King County Metro and Sound Transit provided information on any modifications in the transit network. Anticipated “pipeline” development projects were also included as part of the traffic forecasting. Trip generation and distribution was calculated for all “pipeline” development projects for the year 2010. Trafficware Synchro 6.0 was used for all intersection analysis.

EXISTING CONDITIONS

The boundaries for the Northgate CTIP analysis area are defined by 130th Street on the north, just to the west of Lake City Way on the east, 85th Street on the south, and Ashworth Avenue on the west. The defined study area encompasses the Northgate Urban Center, which includes North Seattle Community College, Northgate Mall, and most commercial development in the area. Surrounding the urban center is mostly lower density residential developments. Higher density residential and mixed use can be found along the arterials.

Baseline Traffic Volumes (PM Peak Hour)

The major east-west corridors are along Northgate Way and N 130th Street/Roosevelt Way NE/NE 125th Street. The main north-south traffic uses I-5, which is on the western side of the study area. Other corridors that service north-south movement includes: Wallingford Avenue N/College Way N/Meridian Avenue N, 1st Avenue NE, 5th Avenue NE, Roosevelt Way NE, and 15th Avenue NE. Figure 1 shows the existing daily traffic volumes. The highest traffic volumes are concentrated along Northgate Way near I-5 and Northgate Mall. Another concentration of traffic is observed along N 130th Street/Roosevelt Way NE/NE 125th Street. With the exception of I-5, north-south movements are distributed more evenly along the major north-south arterials.

Baseline Levels of Service (PM Peak Hour)

An intersection's level of service (LOS) is a measure of the average delay experienced by each vehicle passing through an intersection. It can be measured for directional turning movement. The LOS is reported with a letter grade designation ranging from A to F. An LOS of A represents insignificant delay (less than 10 seconds per vehicle); an LOS F represents significant waiting (more than 80 seconds per vehicle at a signalized intersection). Figure 2 shows existing intersection levels of service (LOS) and delays. Delays at intersections are concentrated near I-5 and around commercial areas, especially along Northgate Way from Meridian Avenue N to 15th Avenue NE. The I-5 northbound off-ramp at 5th Avenue N has the worst LOS and delay in the study area.

An arterial's level of service (LOS) is a measure of the average travel speed for through vehicles along an urban street. The travel speed along a segment is dependent on the running speed between signalized intersections and the amount of control delay incurred at signalized intersections. Travel time surveys were taken for each analysis segment, which were then used to calculate the average travel speed. Figure 3 shows the existing arterial LOS and associated average speed by direction for each study segment. Overall, nine segments were analyzed. The lowest average speeds are observed along Northgate Way in both directions, NE 125th Street in the westbound direction and 1st Avenue NE in the northbound direction.

Figure 1: Existing Average Weekday Traffic Volumes

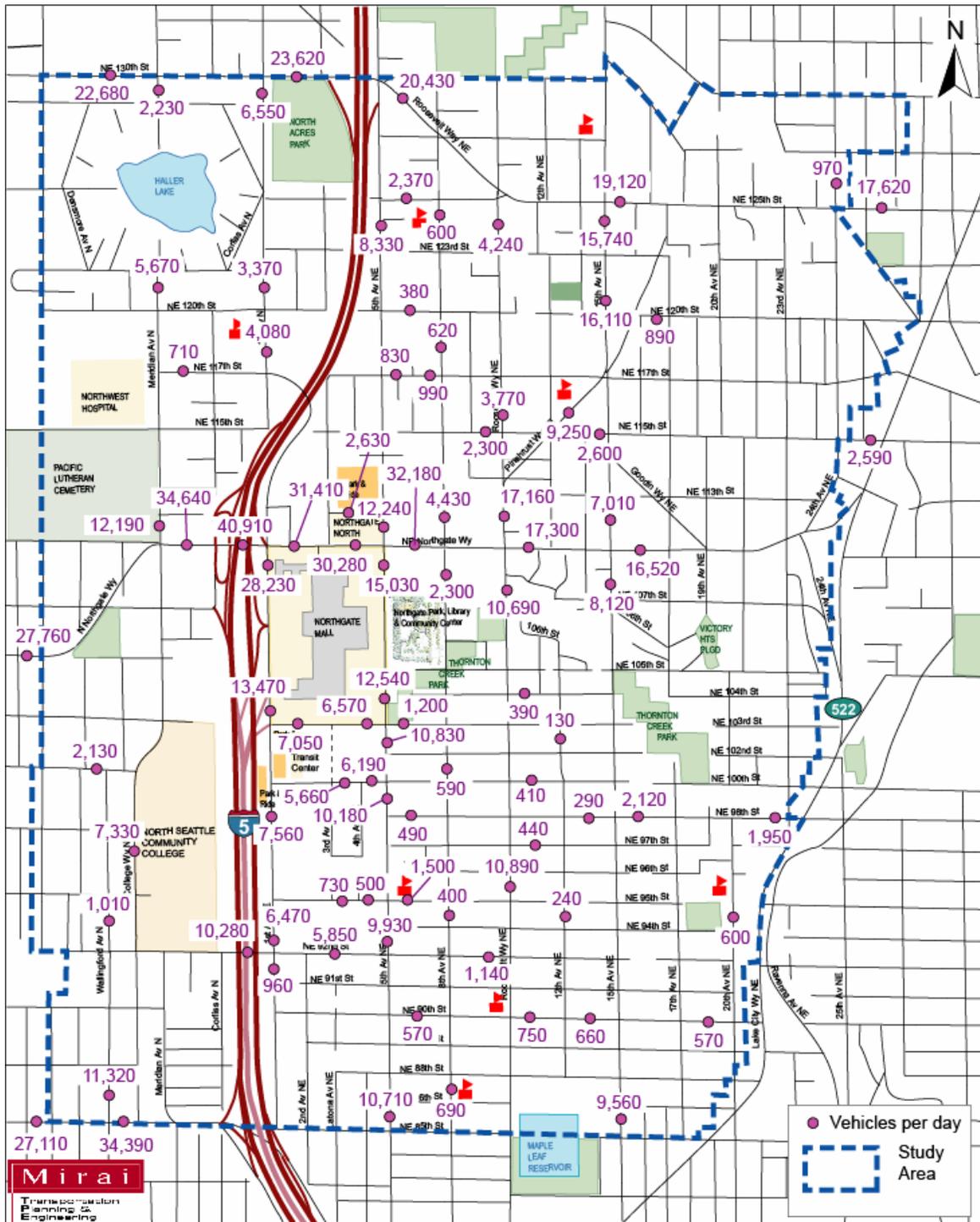


Figure 2: Intersection LOS - Existing PM Peak Hour

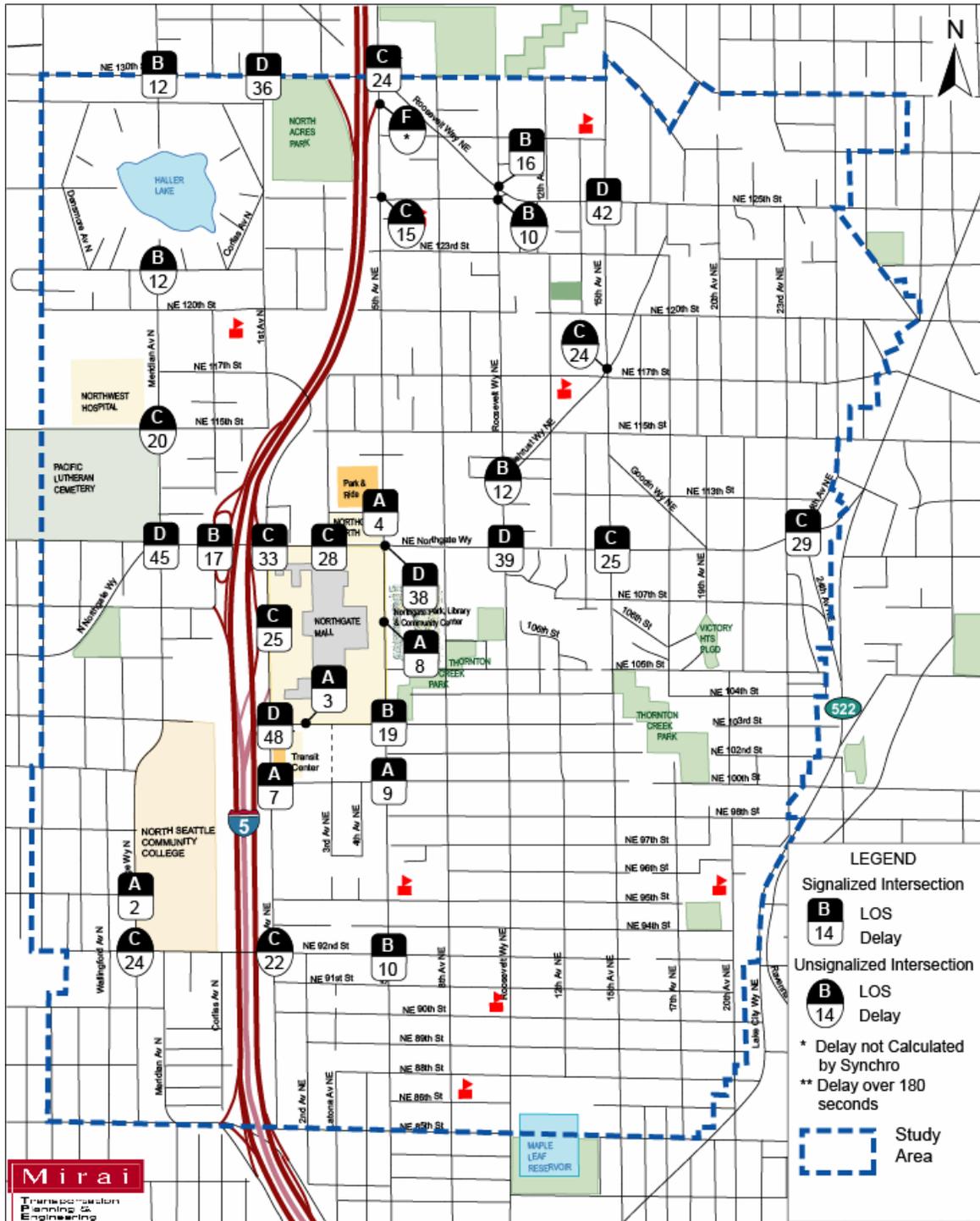
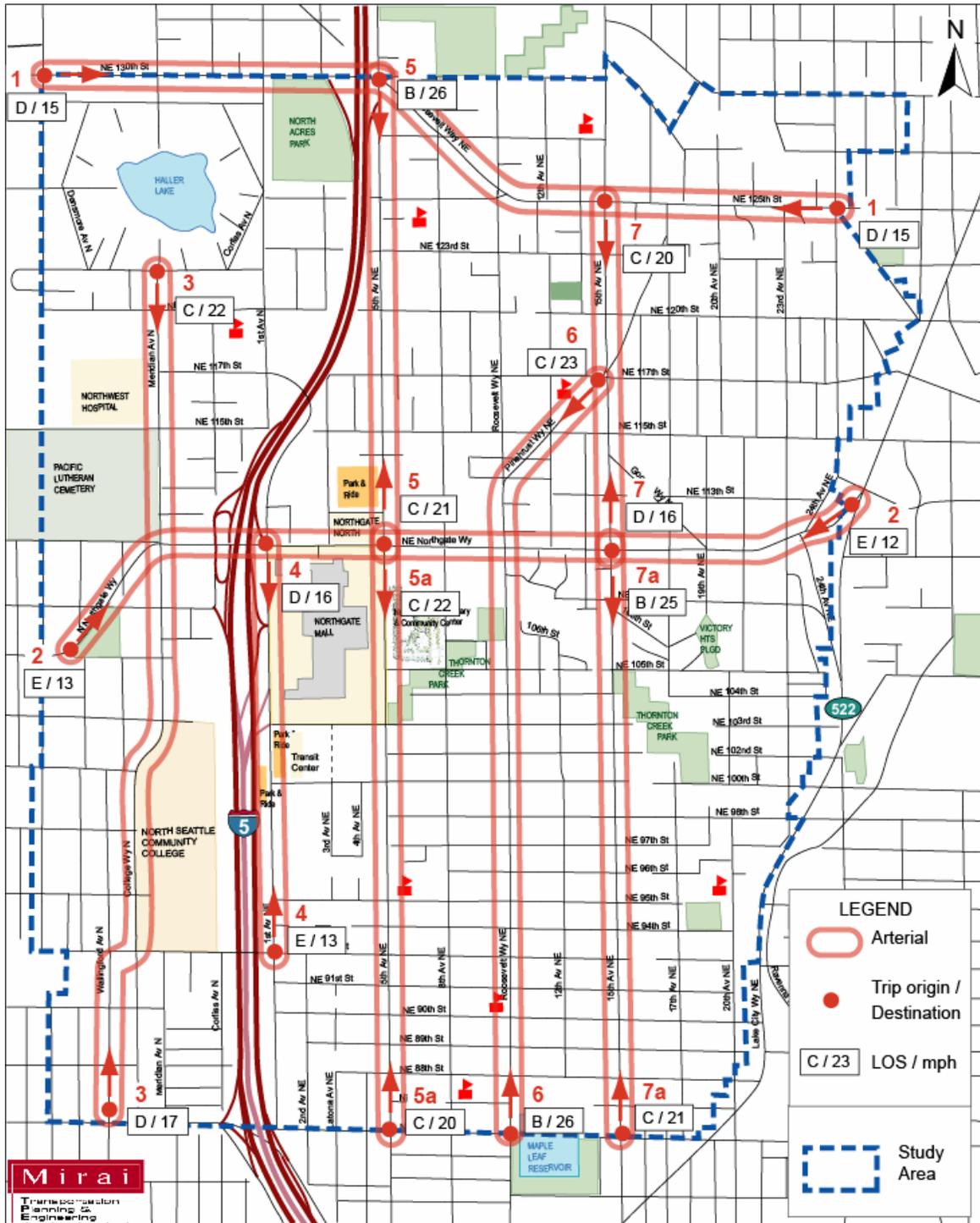


Figure 3: Existing Arterial LOS and Average Speed



2010 CONDITIONS

By 2010, the Northgate area is expected to generate a fair amount of traffic. Currently, several development projects are in the pipeline and anticipated to be constructed by 2010. This traffic analysis takes into account for these developments, projected background land use growth and planned roadway network changes for 2010.

Land Use Forecasts

To forecast the future traffic volumes and understand their implication to traffic flow within and surrounding the Northgate planning area, Mirai Transportation, Planning and Engineering used the City of Seattle’s travel demand forecast model, which covers the entire region, but focuses on the City of Seattle. This model land use database has been adjusted to represent the future Northgate study area.

Demographic data sets, including household and employment forecasts associated with a system of transportation analysis zones (TAZs) form the basis for travel demand forecasting. The City of Seattle provided the household and employment forecasts as part of their travel demand forecast model. Table 1 shows a summary of the 2000 households, employment and student data and the 2010 and 2030 households, employment and student forecasts for the baseline. This information provides the basis for the background growth in trips. Figures of the TAZs pertaining to the study area and land use details are located in the Appendix.

Table 1: 2010 and 2030 Household, Employment, and Student Forecasts

Year	Household	% increase (2000)	Employment	% increase (2000)	Full-Time Equivalent Student	% increase (2000)
2000	14,233	-	17,092	-	4,035	-
2010	15,717	10.4%	19,906	16.5%	4,405	9.2%
2030	20,572	44.5%	27,271	59.6%	5,152	27.7%

For 2010, eight “pipeline” projects are to be completed. The Northwest Hospital Expansion is assumed to be part of the 2010 background growth. Table 2 provides a summary of each project’s land use changes assumed for the 2010 and 2030 forecasts.

2010 Arterial/Transit Network

The 2010 baseline network used for the Northgate CTIP traffic analysis adopted the following improvements that are assumed to occur by 2010:

- New 3rd Avenue NE between NE 100th Street and NE 103rd Street.
- 296 King County Metro Park and Ride spaces in the analysis area will be removed. These spaces will be transferred to the new garages that are being built for the Northgate Commons project.

Table 2: Northgate CTIP Traffic Analysis: 2010 and 2030 Pipeline Development Project Assumptions

Pipeline Projects	Analysis Horizon Year	Use	Area (SF)	Units
Northgate Community Center and Library	2010	Community Center	20,000	
		Library	10,000	
Northgate Mall Expansion	2010	Retail	100,000	
Northgate Commons	2010	Residential (rental)		250 units
		Residential (condo)		110 units
		Residential (senior)		129 units
		Retail	20,000	
		Restaurant (sit-down)	15,000	
		Restaurant (eateries)	15,000	
		Theater		3,260 seats
		KC Metro Park and Ride		400 stalls
King County Northgate TOD	2010	Residential		120 units
		Restaurants	25,000	
		Retail shops	40,000	
	2020	Hotel	46,000	170 rooms
		Restaurants	15,000	
		Retail shops	30,000	
		Residential	75,000	80 units
	2030	Retail	16,000	
		Residential	327,000	340 units
		Health club	24,000	
2010	Daycare	16,000		
	Northgate TC Park and Ride Removal		-296 Stalls	
Wallace Development	CURRENT	Retail	-19,801	
		Retail	-15,620	
		Retail	-15,188	
	2010	Retail New	100,000	
		Residential New		350 units
Mullally Development	CURRENT	Residential		200 units
	2010	Residential Removal		-100 units
		Residential Addition		500 units
		Hotel		135 units
		Commercial New	100,000	
	2030	Commercial New	9,000	
Residential Removal			-100 units	
		Residential Addition		500 units
Potter Development	CURRENT	Residential		144 units
	2010	Residential Addition		200 units
Northgate Medical Pavilion	2010	Medical office	67,937	

2010 Baseline Traffic Volumes (PM Peak Hour)

In order to calculate intersection levels of service for the future planning year, the forecast volumes from the City of Seattle’s model were “post-processed”. This means that the model volumes were adjusted with the existing traffic counts and checked for consistency through the traffic corridors within the study area. Post-processing is done manually using electronic spreadsheets. After completing the post-processing work, the 2010 baseline PM peak hour traffic volumes were input into the Synchro 6 software where it calculated the levels of service. Figure 4 and Figure 5 show the existing, 2010 and 2030 approach volumes at key intersections for the Northgate Area.

2010 Baseline Levels of Service (PM Peak Hour)

The 2010 traffic volume for each intersection approach was read by Synchro software to calculate future levels of service. Signalized intersections were individually optimized except for the signals around the Transit Center and along the commercialized portion of Northgate Way. They were interconnected and coordinated. Figure 6 shows the results for each intersection in terms of LOS and average intersection delay for the 2010 baseline. Table 3 provides more detail into the intersection delay by movement and approach. For unsignalized intersections, the worst movement’s LOS and delay is provided.

For this analysis, the new intersection at 3rd Avenue NE and NE 103rd Street is to be signalized. The intersection at 3rd Avenue NE and NE 100th Street is kept as an unsignalized intersection with stop signs in the north-south movement.

As calculated by Synchro software, the resulting control delays incurred at signalized intersections for the through movement were used in calculating the arterial LOS in 2010. Figure 7 shows the resulting arterial LOS and average speeds by direction for each selected segment.

2010 Key Findings

- Two signalized intersections along Northgate Way would operate at LOS F.
 - N Northgate Way and Meridian Avenue N
 - NE Northgate Way and 5th Avenue NE
- Several unsignalized intersections would operate at LOS F on one of the stop approaches in 2010.
 - I-5 NB off-ramp and 1st Avenue NE
 - Pinehurst Way NE and 15th Avenue NE
 - New 3rd Avenue NE and NE 100th Street
 - College Way N and N 92nd Street
 - 1st Avenue NE and NE 92nd Street
- Average speeds on most arterials would decrease from existing levels.
- Only arterial segment that would operate at LOS F is along 15th Avenue NE between Northgate Way and NE 125th Street in the northbound direction. The greatest contribution to the LOS F condition is the increased delays at the unsignalized intersection at 15th Avenue NE and Pinehurst Way NE.

Figure 4: Approach Volumes PM Peak Hour Volumes (Existing, 2010, 2030) – Northgate Vicinity

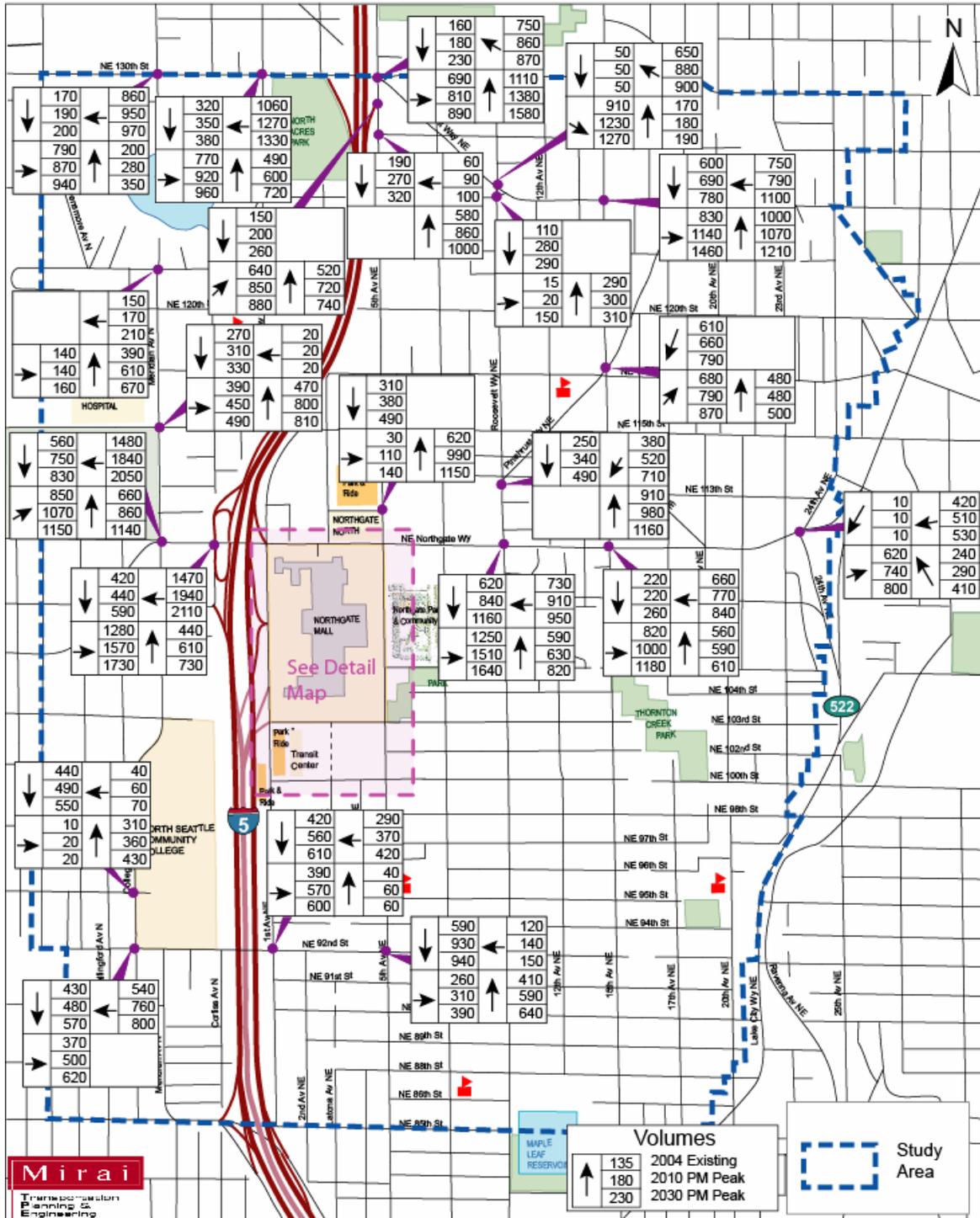


Figure 5: Approach Volumes PM Peak Hour (Existing, 2010, 2030) – Northgate Detailed Area

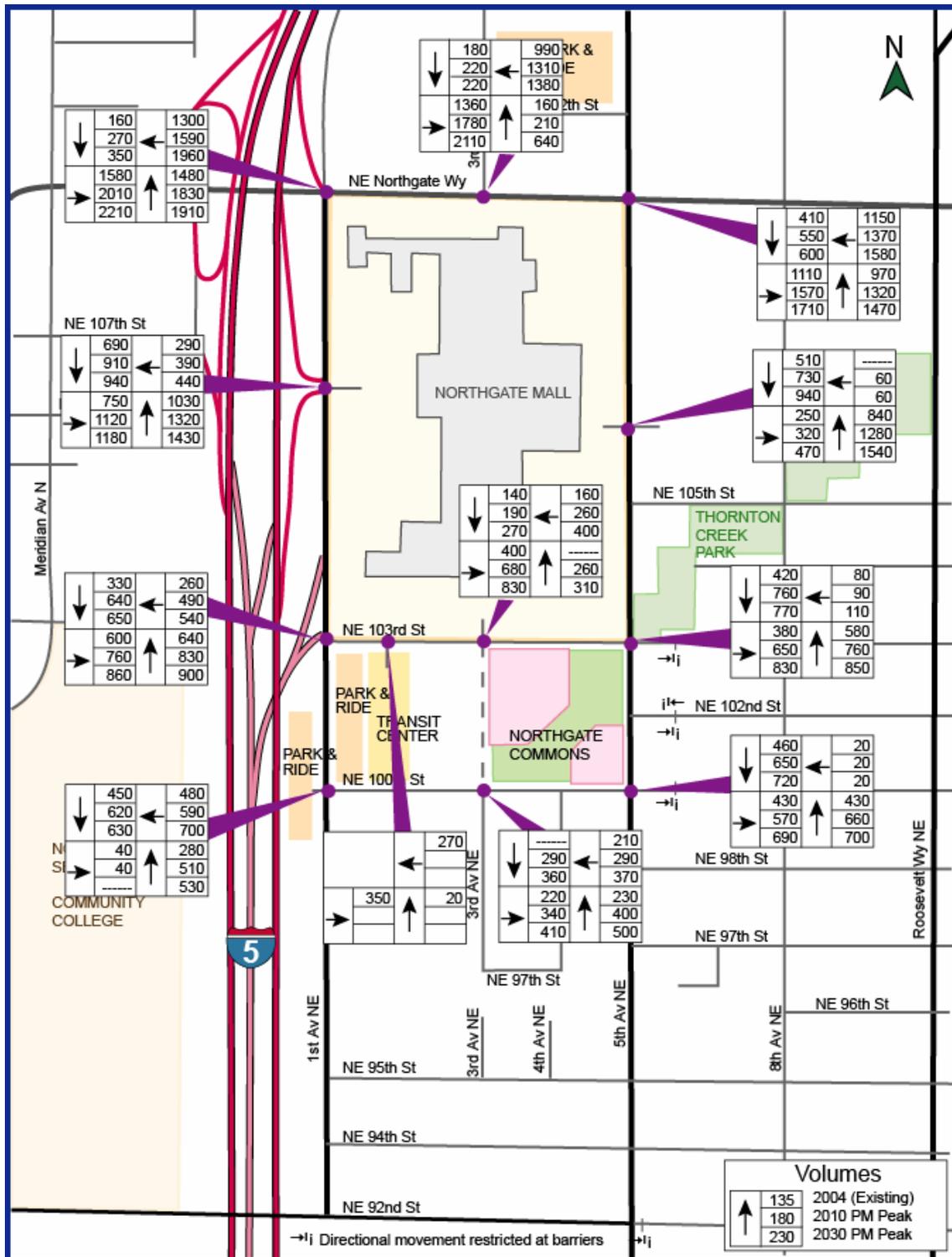


Figure 6: Intersection LOS – 2010 Baseline PM Peak Hour

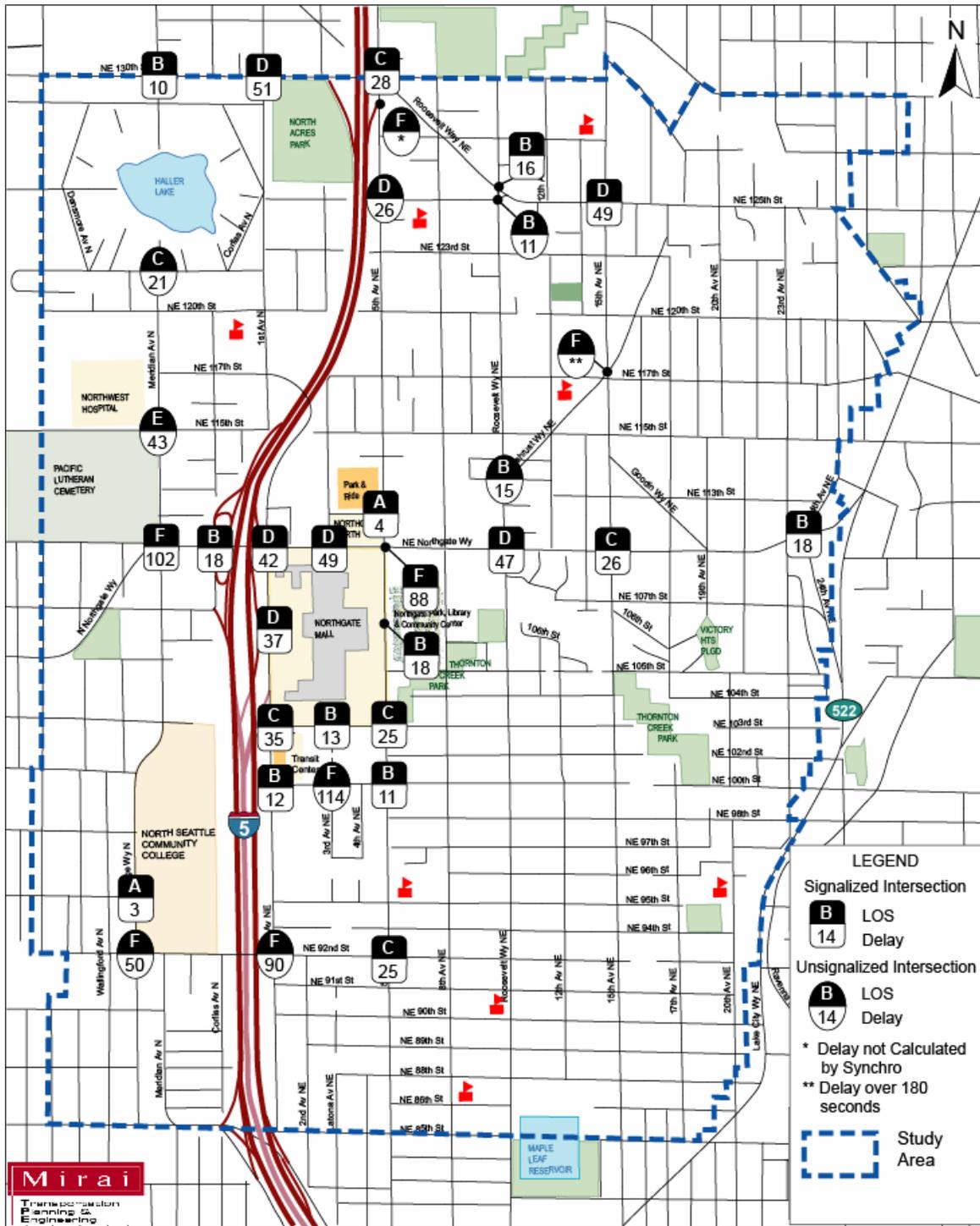


Table 3: 2010 PM Peak Hour Intersection Performance Measures

No.	N-S Street	E-W Street	EB			WB			NB			SB			Int.
			EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
1	Meridian Ave N	NE 130th St	-	A	-	-	A	-	-	C	-	-	B	-	
			-	8	-	-	7	-	-	23	-	-	16	-	
			A			A			C			B			B
			8			7			23			16			10
2	1st Ave NE	NE 130th St	E	D	-	E	D	-	E	D	-	F	B	-	
			76	48	-	69	52	-	57	50	-	84	20	-	
			D			D			D			D			D
			50			54			50			50			51
3	5th Ave NE	NE 130th St	-	C	-	-	C	A	D	C	-	C	C	-	
			-	27	-	-	23	5	41	27	-	35	28	-	
			C			C			C			C			C
			27			21			32			32			28
4	5th Ave NE	I-5 NB off ramp	F	-	F	-	-	-	-	A	-	-	A	-	EBL/R
			*	-	*	-	-	-	-	0	-	-	0	-	
			-			-			-			-			F
			-			-			-			-			*
5	5th Ave NE	NE 125th St	-	-	-	D	-	D	-	A	A	A	A	-	WBL/R
			-	-	-	26	-	26	-	0	0	0.4	1.3	-	
			-			-			-			-			D
			-			-			-			-			26
6	10 th Ave NE	Roosevelt Way	D	C	-	D	C	-	A	B	-	E	A	-	
			45	31	-	37	27	-	8	10	-	74	8	-	
			D			C			B			B			B
			44			28			10			17			16
7	15 th Ave NE	NE 125th St	E	D	-	E	D	-	E	E	-	F	C	-	
			66	35	-	67	41	-	68	57	-	107	33	-	
			D			D			E			D			D
			43			46			58			49			49
8	Meridian Ave N	NE 122nd St	-	B	B	B	B	-	D	-	D	-	-	-	NBL/R
			-	10	10	11	11	-	26	-	26	-	-	-	
			-			-			-			-			C
			-			-			-			-			21

(See key at the end of the table for clarification)

No.	N-S Street	E-W Street	EB			WB			NB			SB			Int.	
			EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
9	15 th Ave NE	Pinehurst Way NE	A	-	-	-	-	-	-	F	-	-	B	A	NBT	
			0	-	-	-	-	-	-	**	-	-	12	0		
			-	-	-	-	-	-	-	-	-	-	-	-	-	F
			-	-	-	-	-	-	-	-	-	-	-	-	-	**
10	Meridian Ave N	NE 115 th St	E	E	E	B	B	B	C	F	F	C	C	C	NBT/R	
			35	35	35	12	12	12	22	77	77	20	20	20		
			-	-	-	-	-	-	-	-	-	-	-	-	-	E
			-	-	-	-	-	-	-	-	-	-	-	-	-	43
11	Roosevelt Way	Pinehurst Way	-	-	-	A	-	-	-	B	A	-	B	-	SBT	
			-	-	-	0	-	-	-	10	0	-	15	-		
			-	-	-	-	-	-	-	-	-	-	-	-	-	B
			-	-	-	-	-	-	-	-	-	-	-	-	-	15
12	5th Ave NE	NE 112 th St	B	-	A	-	-	-	A	A	-	-	A	-		
			18	-	8	-	-	-	2	3	-	-	4	-		
			A	-	-	-	-	-	A	-	-	A	-	-	A	
			10	-	-	-	-	-	3	-	-	4	-	-	4	
13	Meridian Ave N	N Northgate Way	F	D	-	D	F	-	E	D	A	F	E	-		
			108	13	-	54	89	-	59	47	7	**	65	-		
			E	-	-	-	F	-	-	C	-	-	F	-	F	
			66	-	-	-	84	-	-	30	-	-	**	-	102	
14	Corliss Ave N	N Northgate Way	-	B	-	-	B	-	-	B	-	-	D	-		
			-	16	-	-	15	-	-	16	-	-	39	-		
			B	-	-	-	B	-	-	B	-	-	D	-	B	
			16	-	-	-	45	-	-	16	-	-	39	-	18	
15	1 st Ave NE	NE Northgate Way	-	C	A	-	C	D	F	C	B	F	D	-		
			-	33	2	-	24	53	101	30	14	83	49	-		
			C	-	-	-	C	-	-	E	-	-	E	-	D	
			21	-	-	-	35	-	-	69	-	-	56	-	42	
16	3 rd Ave NE	NE Northgate Way	F	A	A	-	F	-	C	-	A	-	-	A		
			154	5	1	-	83	-	20	-	9	-	-	1		
			C	-	-	-	F	-	-	B	-	-	A	-	C	
			33	-	-	-	83	-	-	20	-	-	1	-	49	

(See key at the end of the table for clarification)

No.	N-S Street	E-W Street	EB			WB			NB			SB			Int.
			EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
17	5 th Ave NE	NE Northgate Way	D	F	-	F	C	-	F	D	E	F	C	-	
			52	118	-	**	27	-	**	36	59	154	26	-	
			F			E			F			E			
			110			78			80			69			
18	Roosevelt Way NE	NE 125 th St	B	B	B	-	-	-	A	A	A	-	A	A	EB
			11	11	11	-	-	-	0	0	0	-	0	0	
			-			-			-			-			B
			-			-			-			-			11
19	Roosevelt Way NE	NE Northgate Way	F	C	-	E	F	-	D	C	-	E	C	-	
			83	22	-	55	84	-	49	20	-	58	32	-	
			D			F			C			C			
			41			81			27			35			
20	15 th Ave NE	NE Northgate Way	D	B	A	D	C	-	-	D	-	-	C	-	
			41	20	2	46	26	-	-	37	-	-	22	-	
			B			B			C			C			
			19			28			37			22			
21	1 st Ave NE	I-5 NB ramps	E	E	A	D	D	D	C	D	-	D	C	A	
			57	61	5	43	49	48	24	41	-	51	32	3	
			D			D			D			C			
			48			48			38			20			
22	5 th Ave NE	NE 106 th St	C	C	-	-	B	-	C	B	-	D	B	-	
			29	22	-	-	18	-	33	17	-	38	15	-	
			C			B			B			B			
			26			18			18			16			
23	5 th Ave NE	NE 105 th St	-	-	-	D	-	D	-	A	A	B	A	-	WBL/R
			-	-	-	34	-	34	-	0	0	13	0	-	
			-			-			-			-			
			-			-			-			-			
24	1 st Ave NE	NE 103 rd St	D	D	-	E	-	B	-	D	B	C	B	-	
			54	49	-	56	-	16	-	38	12	35	12	-	
			D			C			C			C			
			51			27			34			23			

(See key at the end of the table for clarification)

No.	N-S Street	E-W Street	EB			WB			NB			SB			Int.
			EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
25	3 rd Ave NE	NE 103 rd St	A	B	-	A	A	-	B	A	-	B	A	-	
			8	19	-	9	7	-	14	4	-	12	4	-	
			B			A			B			A			B
			18			7			10			6			13
26	5 th Ave NE	NE 103 rd St	C	A	-	-	C	-	E	C	-	B	C	-	
			35	5	-	-	27	-	65	21	-	19	22	-	
			C			C			C			C			C
			27			27			26			21			25
27	1 st Ave NE	NE 100 th St	-	A	-	-	B	A	-	B	-	C	B	-	
			-	7	-	-	16	6	-	12	-	32	10	-	
			A			A			B			B			B
			7			10			12			16			12
28	3 rd Ave NE	NE 100 th St	A	A	A	A	A	A	F	B	B	F	B	B	SBL
			8	0	0	8	0	0	71	14	14	114	11	11	
			-			-			-			-			F
			-			-			-			-			114
29	5 th Ave NE	NE 100 th St	-	C	A	-	A	-	B	B	-	-	B	A	
			-	21	7	-	8	-	13	11	-	-	11	2	
			B			A			B			A			B
			13			8			11			9			11
30	College Way N	N 95 th St	-	A	-	-	A	-	-	A	-	A	A	-	
			-	6	-	-	8	-	-	2	-	3	2	-	
			A			A			A			A			A
			6			8			2			2			3
31	College Way N	N 92 nd Way	C	C	-	-	F	B	-	-	-	C	-	C	WBT
			15	23	-	-	120	13	-	-	-	20	-	15	
			-			-			-			-			F
			-			-			-			-			50
32	1 st Ave NE	NE 92 nd Way	F	F	F	D	D	D	B	B	B	F	F	F	EB
			132	132	132	34	34	34	14	14	14	94	94	94	
			-			-			-			-			F
			-			-			-			-			90

(See key at the end of the table for clarification)

No.	N-S Street	E-W Street	EB			WB			NB			SB			Int.
			EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
33	5 th Ave NE	NE 92 nd Way	E	-	A	-	D	-	-	D	-	-	B	-	
			60	-	9	-	36	-	-	43	-	-	11	-	
			C			D			D			B			C
			28			36			43			11			25
34	24 th Ave NE	NE Northgate Way	-	C	-	-	B	-	-	B	-	-	A	-	
			-	22	-	-	13	-	-	16	-	-	0	-	
			C			B			B			A			B
			22			13			16			0			18

Notes:

NB		
NBL	NBT	NBR
B	A	B
15	3	11
A		
5		

← by turning movement

← by approach

NB: Northbound SB: Southbound L: Left
 EB: Eastbound WB: Westbound T: Through
 Int.: Intersection R: Right
Unsignalized / Signalized Intersection
 * not calculated by Synchro
 ** over 180 seconds

2030 CONDITIONS

By 2030, Northgate is expected to receive a fair amount of the region's growth. The Puget Sound Regional Council and the City of Seattle have designated this area to be regional urban center. All currently, identified "pipeline" development projects would be completed by 2030. This analysis will take into account for these land use and planned roadway network changes in the traffic analysis for 2030.

2030 Arterial/Transit Network

In addition to the 2010 changes, the 2030 baseline network used for the Northgate CTIP traffic analysis adopted the following improvements that are assumed to occur by 2030:

- As part of the new Light Rail station and reconfigured transit center operations, one general-purpose lane in each direction on 1st Avenue NE between NE 100th Street and NE 103rd Street will be converted to become bus bays for the transit station.
- King County Metro's 1,400 Park and Ride spaces in the analysis area will be consolidated at the current Northgate Transit Center.
- Sound Transit light rail station will be constructed to the east of 1st Avenue NE over NE 103rd Street.

2030 Baseline Traffic Volumes (PM Peak Hour)

In order to calculate intersection levels of service for the future planning year, the forecast volumes from the City of Seattle's model were "post-processed". This means that the model volumes were adjusted with the existing traffic counts and checked for consistency through the traffic corridors within the study area. Post-processing is done manually using electronic spreadsheets. After completing the post-processing work, the 2030 baseline PM peak hour traffic volumes were input into the Synchro 6 software where it calculated the levels of service. Figure 4 and Figure 5 show the approach volumes at key intersections for the Northgate Area.

2030 Baseline Levels of Service (PM Peak Hour)

The 2030 traffic volume for each intersection approach was read by Synchro software to calculate future levels of service. The optimization of signalized intersections was completed in the same manner as the analysis for 2010. Figure 8 shows the results for each intersection in terms of LOS and average intersection delay for the 2030 baseline. Table 4 provides more detail into the intersection delay by movement. For unsignalized intersections, the worst movement's LOS and delay is provided unless the intersection is an all-way stop.

For this analysis, 1st Avenue NE between NE 100th Street and NE 103rd Street will only have one general purpose through lane in the southbound direction. See Appendix for 1st Avenue NE lane configuration details. At 1st Avenue NE and NE 100th Street, the west leg of the intersection will be eliminated as part of the Park and Ride consolidation at the Northgate Transit Center.

As calculated by Synchro software, the resulting control delays incurred at signalized intersections for the through movement were used in calculating the arterial LOS in 2010. Figure 9 shows the resulting arterial LOS and average speeds by direction for each selected segment.

2030 Key Findings

By 2030, Northgate Way would be heavily congested between Meridian Avenue N and Roosevelt Way NE, even if all intersections in this segment are interconnected and optimized for the signal operation. The average travel speeds in most corridors would be slower, especially along N 130th/Roosevelt Way NE/NE 125th Street and Northgate Way in both directions. Among the six intersections along this segment, two would operate at LOS F and three at LOS E. In addition to the Northgate Way intersections, three other signalized intersections would operate at LOS E in 2030: NE 125th Street and 15th Avenue NE, N 130th Street and 1st Avenue N and NE 92nd Street and 5th Avenue NE.

For those unsignalized intersections, which were found to operate at LOS F in 2010, they would operate with even higher delays in 2030. The following unsignalized intersections would operate with unacceptable delay:

- 1st Avenue NE and NE 92nd Street
- New 3rd Avenue NE and NE 100th Street
- 1st Avenue NE and I-5 off-ramp
- 15th Avenue NE and Pinehurst Way NE
- Meridian Avenue N and N 115th Street
- College Way N and N 92nd Street

Figure 8: Intersection LOS – 2030 Baseline PM Peak Hour

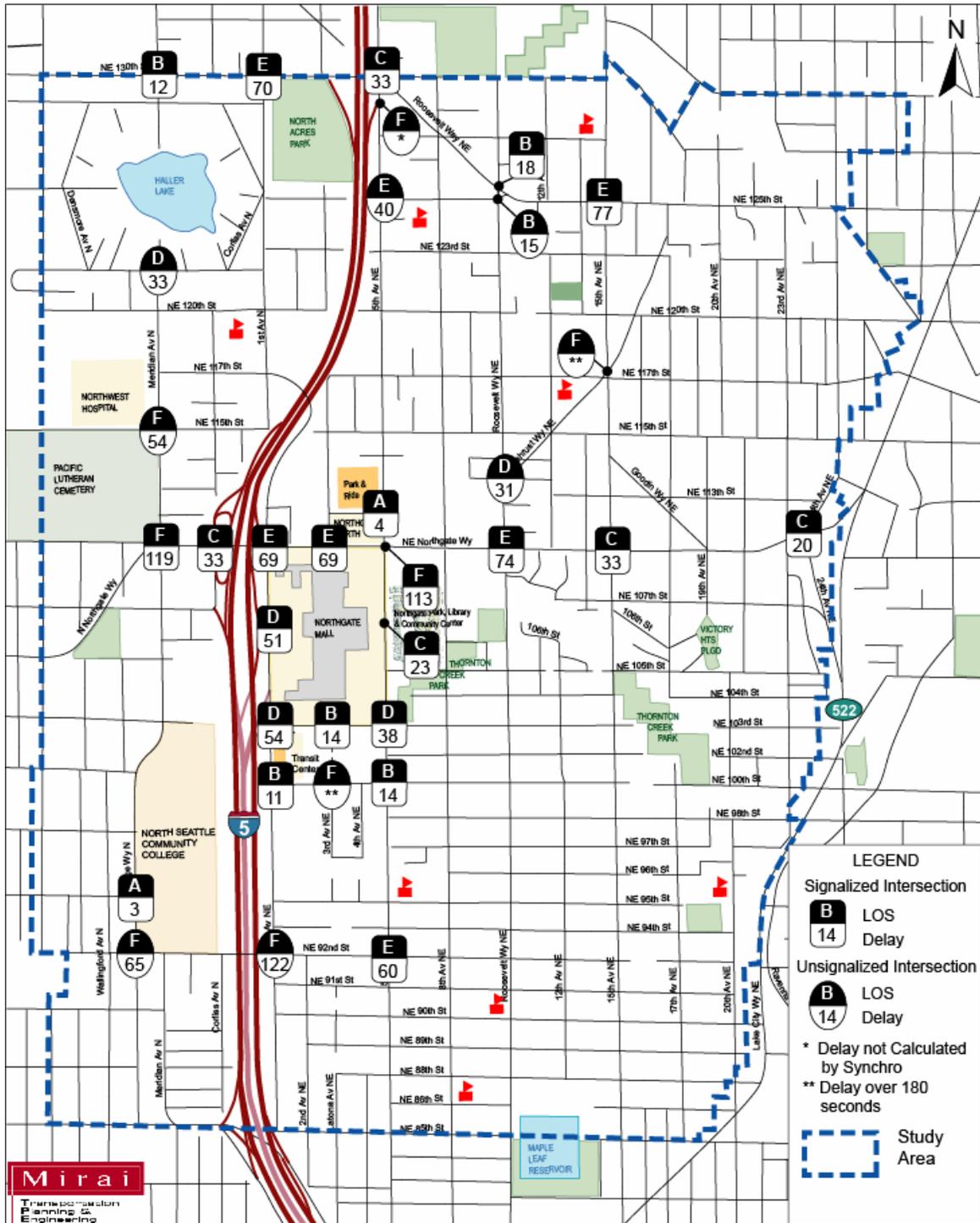


Table 4: 2030 PM Peak Hour Intersection Performance Measures

No.	N-S Street	E-W Street	EB			WB			NB			SB			Int.
			EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
1	Meridian Ave N	NE 130th St	-	B	-	-	A	-	-	C	-	-	B	-	B
			-	10	-	-	8	-	-	26	-	-	17	-	
			B			A			C			B			
			10			8			26			17			12
2	1st Ave NE	NE 130th St	F	E	-	E	E	-	E	E	-	F	B	-	E
			84	61	-	76	75	-	61	74	-	115	20	-	
			E			E			E			E			
			62			75			73			65			70
3	5th Ave NE	NE 130th St	-	C	-	-	C	A	D	C	-	D	C	-	C
			-	35	-	-	24	5	53	31	-	37	27	-	
			C			C			C			C			
			35			22			39			32			33
4	5th Ave NE	I-5 NB off ramp	F	-	F	-	-	-	-	A	-	-	A	-	EBL/R
			*	-	*	-	-	-	-	0	-	-	0	-	
			-			-			-			-			
			-			-			-			-			F
			-			-			-			-			*
5	5th Ave NE	NE 125th St	-	-	-	E	-	E	-	A	A	A	A	-	WBL/R
			-	-	-	40	-	40	-	0	0	1	2	-	
			-			-			-			-			
			-			-			-			-			E
			-			-			-			-			40
6	10 th Ave NE	Roosevelt Way	D	C	-	D	C	-	A	B	-	F	A	-	B
			46	31	-	37	27	-	8	11	-	107	8	-	
			D			C			B			C			
			44			28			11			22			18
7	15 th Ave NE	NE 125th St	F	D	-	F	F	-	E	F	-	F	C	-	E
			108	51	-	114	85	-	76	91	-	138	35	-	
			E			F			F			E			
			66			90			89			58			77
8	Meridian Ave N	NE 122nd St	-	B	B	B	B	-	E	-	E	-	-	-	NBL/R
			-	11	11	13	13	-	44	-	44	-	-	-	
			-			-			-			-			
			-			-			-			-			D
			-			-			-			-			33

(See key at the end of the table for clarification)

No.	N-S Street	E-W Street	EB			WB			NB			SB			Int.	
			EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
9	15 th Ave NE	Pinehurst Way NE	A	-	-	-	-	-	-	F	-	-	B	A	NBT	
			0	-	-	-	-	-	-	**	-	-	13	0		
			-	-	-	-	-	-	-	-	-	-	-	-	-	F
			-	-	-	-	-	-	-	-	-	-	-	-	-	**
10	Meridian Ave N	NE 115 th St	E	E	E	B	B	B	C	F	F	C	C	C	NBT/R	
			46	46	46	12	12	12	22	99	99	23	23	23		
			-	-	-	-	-	-	-	-	-	-	-	-	-	F
			-	-	-	-	-	-	-	-	-	-	-	-	-	54
11	Roosevelt Way	Pinehurst Way	-	-	-	A	-	-	-	B	A	-	D	-	SBT	
			-	-	-	0	-	-	-	12	0	-	31	-		
			-	-	-	-	-	-	-	-	-	-	-	-	-	D
			-	-	-	-	-	-	-	-	-	-	-	-	-	31
12	5th Ave NE	NE 112 th St	B	-	A	-	-	-	A	A	-	-	A	-		
			18	-	8	-	-	-	3	4	-	-	5	-		
			A	-	-	-	-	-	A	-	-	-	A	-	A	
			10	-	-	-	-	-	4	-	-	-	5	-	4	
13	Meridian Ave N	N Northgate Way	F	E	-	E	F	-	F	F	E	F	F	-		
			122	56	-	76	138	-	89	113	62	**	156	-		
			E	-	-	F	-	-	F	-	-	F	-	-	F	
			62	-	-	129	-	-	86	-	-	**	-	-	119	
14	Corliss Ave N	N Northgate Way	-	D	-	-	C	-	-	B	-	-	D	-		
			-	38	-	-	23	-	-	18	-	-	48	-		
			D	-	-	C	-	-	B	-	-	D	-	C		
			38	-	-	23	-	-	18	-	-	48	-	33		
15	1 st Ave NE	NE Northgate Way	-	E	A	-	C	F	F	C	C	F	E	-		
			-	78	2	-	26	156	121	33	21	145	61	-		
			D	-	-	E	-	-	F	-	-	F	-	E		
			50	-	-	75	-	-	82	-	-	83	-	69		
16	3 rd Ave NE	NE Northgate Way	F	A	A	-	F	-	F	-	A	-	-	A		
			**	8	1	-	105	-	88	-	9	-	-	2		
			D	-	-	F	-	-	F	-	-	A	-	E		
			46	-	-	105	-	-	86	-	-	2	-	69		

(See key at the end of the table for clarification)

No.	N-S Street	E-W Street	EB			WB			NB			SB			Int.
			EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
17	5 th Ave NE	NE Northgate Way	E	F	-	F	D	-	F	D	F	F	C	-	
			68	162	-	**	47	-	**	44	88	**	26	-	
			F			F			F			F			F
			150			90			104			87			113
18	Roosevelt Way NE	NE 125 th St	B	B	B	-	-	-	A	A	A	-	A	A	EB
			15	15	15	-	-	-	0	0	0	-	0	0	
			-			-			-			-			B
			-			-			-			-			15
19	Roosevelt Way NE	NE Northgate Way	F	B	-	E	F	-	F	C	-	F	F	-	
			105	18	-	62	96	-	**	29	-	96	104	-	
			D			F			E			F			E
			45			93			67			103			74
20	15 th Ave NE	NE Northgate Way	D	C	A	D	C	-	-	D	-	-	C	-	
			52	31	2	54	26	-	-	51	-	-	24	-	
			C			C			D			C			C
			29			28			51			24			33
21	1 st Ave NE	I-5 NB ramps	E	F	A	D	D	E	C	E	-	F	C	A	
			74	83	6	42	49	65	25	57	-	92	33	4	
			E			E			D			C			D
			66			59			51			27			51
22	5 th Ave NE	NE 106 th St	D	D	-	C	B	-	D	B	-	D	B	-	
			43	36	-	35	15	-	48	20	-	45	16	-	
			D			C			C			B			C
			39			22			22			17			23
23	5 th Ave NE	NE 105 th St	-	-	-	C	-	C	-	A	A	B	A	-	WBL/R
			-	-	-	23	-	23	-	0	0	14	0	-	
			-			-			-			-			C
			-			-			-			-			23
24	1 st Ave NE	NE 103 rd St	F	E	-	F	-	D	-	D	-	D	B	-	
			82	58	-	98	-	54	-	50	-	42	11	-	
			E			E			D			C			D
			71			65			50			26			54

(See key at the end of the table for clarification)

No.	N-S Street	E-W Street	EB			WB			NB			SB			Int.
			EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
25	3 rd Ave NE	NE 103 rd St	A	B	-	D	A	-	B	A	-	B	A	-	
			5	17	-	40	7	-	18	5	-	13	5	-	
			B			B			B			A			B
			15			17			13			7			14
26	5 th Ave NE	NE 103 rd St	E	A	-	-	D	-	F	C	-	C	C	-	
			61	5	-	-	41	-	123	28	-	25	26	-	
			D			D			D			C			D
			47			41			40			26			38
27	1 st Ave NE	NE 100 th St	-	-	-	B	-	B	-	A	A	B	A	-	
			-	-	-	18	-	12	-	9	3	14	9	-	
			-			B			A			B			B
			-			14			8			11			11
28	3 rd Ave NE	NE 100 th St	A	A	A	A	A	A	F	C	C	F	C	C	SBL
			8	0	0	8	0	0	**	23	23	**	19	19	
			-			-			-			-			F
			-			-			-			-			**
29	5 th Ave NE	NE 100 th St	-	C	A	-	A	-	C	B	-	-	B	A	
			-	28	9	-	9	-	24	12	-	-	13	2	
			B			A			B			B			B
			18			9			15			10			14
30	College Way N	N 95 th St	-	A	-	-	A	-	-	A	-	A	A	-	
			-	7	-	-	7	-	-	3	-	3	3	-	
			A			A			A			A			A
			7			7			3			3			3
31	College Way N	N 92 nd Way	C	E	-	-	F	C	-	-	-	C	-	C	WBT
			22	37	-	-	166	16	-	-	-	25	-	22	
			-			-			-			-			F
			-			-			-			-			65
32	1 st Ave NE	NE 92 nd Way	F	F	F	E	E	E	B	B	B	F	F	F	EB
			169	169	169	48	48	48	14	14	14	137	137	137	
			-			-			-			-			F
			-			-			-			-			122

(See key at the end of the table for clarification)

No.	N-S Street	E-W Street	EB			WB			NB			SB			Int.
			EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
33	5 th Ave NE	NE 92 nd Way	E	-	B	-	D	-	-	F	-	-	B	-	
			70	-	12	-	36	-	-	155	-	-	12	-	
			C			D			F			B			E
			31			36			155			12			60
34	24 th Ave NE	NE Northgate Way	-	C	-	-	B	-	-	C	-	-	A	-	
			-	26	-	-	12	-	-	22	-	-	0	-	
			C			B			B			A			C
			26			12			22			0			20

Notes:

NB		
NBL	NBT	NBR
B	A	B
15	3	11
A		
5		

← by turning movement

← by approach

NB: Northbound SB: Southbound L: Left
 EB: Eastbound WB: Westbound T: Through
 Int.: Intersection R: Right
Unsignalized / Signalized Intersection
 * not calculated by Synchro
 ** over 180 seconds

APPENDIX: 2000 Land Use Assumptions

2000								
STAZ	HH_00	RET_00	FIRES_00	MAN_00	WTCU_00	GOV/ED_00	TOTEMP_00	FTE_Col_00
6	467	0	14	1	0	40	55	0
7	156	0	151	20	121	16	309	0
9	616	0	65	0	35	0	100	0
10	603	0	21	0	1	24	46	0
11	296	0	52	0	0	0	52	0
24	526	0	31	0	1	34	66	0
26	88	8	2308	0	16	0	2333	0
27	334	60	88	46	21	0	215	0
28	144	0	0	0	0	0	0	0
29	243	11	1	0	5	42	59	0
30	1046	32	66	6	25	54	183	0
31	727	126	65	5	13	0	208	0
32	591	442	237	15	4	5	702	0
40	567	102	102	0	5	0	209	0
41	490	1	34	3	34	0	72	0
42	331	133	133	0	0	0	266	0
43	1040	807	1047	9	42	3	1908	0
44	460	0	19	1	11	0	31	0
45	643	108	142	6	0	0	256	0
46	272	95	194	0	0	0	289	0
47	554	66	1541	4	16	133	1761	0
48	0	1850	229	0	1	103	2183	0
49	447	0	150	0	9	262	421	0
50	127	0	0	0	0	0	0	0
71	396	0	39	0	1	0	40	0
72	0	0	0	0	0	1253	1253	4035
73	351	411	2425	194	189	0	3219	0
74	409	0	19	3	1	44	67	0
75	316	102	70	0	0	27	199	0
76	297	18	5	0	0	1	24	0
77	207	0	0	0	1	0	1	0
78	402	45	94	8	12	0	159	0
79	304	12	50	0	1	27	90	0
80	487	31	35	0	6	0	71	0
81	296	32	213	0	0	0	245	0
TOTAL	14233						17092	4035

APPENDIX: 2010 Land Use Forecasts

2010								
STAZ	HH_10	RET_10	FIRES_10	MAN_10	WTCU_10	GOV/ED_10	TOTEMP_10	FTE_Col_10
6	500	0	14	1	0	40	55	0
7	218	12	228	18	110	26	394	0
9	553	0	65	0	32	0	96	0
10	630	0	22	0	1	24	47	0
11	309	1	60	0	0	1	62	0
24	578	0	30	0	1	34	65	0
26	32	8	2482	0	16	14	2520	0
27	384	59	107	45	21	5	237	0
28	148	0	0	0	0	0	0	0
29	252	10	1	0	5	42	58	0
30	1025	31	73	6	25	56	191	0
31	789	128	78	5	12	2	225	0
32	498	452	305	14	3	14	788	0
40	569	105	122	0	4	3	234	0
41	469	16	57	3	31	3	110	0
42	356	134	148	0	0	0	282	0
43	1390	817	1188	8	59	3	2075	0
44	477	0	19	1	15	0	35	0
45	823	108	142	6	0	0	256	0
46	281	96	213	0	0	0	309	0
47	664	89	1868	4	23	119	2103	0
48	0	1761	1474	0	2	92	3329	0
49	445	0	150	0	13	235	398	0
50	136	0	0	0	0	0	0	0
71	411	0	39	0	2	0	41	0
72	0	0	0	0	0	1286	1286	4405
73	886	609	2741	175	267	0	3792	0
74	421	0	19	3	2	39	63	0
75	348	103	84	0	0	24	211	0
76	315	18	7	0	0	1	26	0
77	225	0	0	0	2	0	2	0
78	419	43	94	7	11	0	155	0
79	352	0	59	0	1	40	100	0
80	500	29	47	0	6	21	103	0
81	312	30	219	0	0	9	258	0
TOTAL	15717						19906	4405

APPENDIX: 2030 Land Use Forecasts

2030								
STAZ	HH_30	RET_30	FIRES_30	MAN_30	WTCU_30	GOV/ED_30	TOTEMP_30	FTE_Col_30
6	546	0	14	1	0	38	53	0
7	423	36	336	25	150	25	572	0
9	826	0	65	0	43	0	108	0
10	778	0	23	0	1	23	47	0
11	373	4	72	0	0	1	77	0
24	572	0	30	0	2	34	66	0
26	33	8	2482	0	23	14	2527	0
27	469	70	145	66	29	5	315	0
28	145	0	0	0	0	0	0	0
29	245	10	1	0	6	42	59	0
30	1101	35	86	9	34	56	220	0
31	909	132	97	6	16	2	253	0
32	758	474	400	19	4	13	910	0
40	725	112	150	0	6	3	271	0
41	618	24	90	4	42	3	163	0
42	489	147	177	0	0	0	324	0
43	1789	941	1471	11	105	6	2534	0
44	615	0	19	1	26	0	46	0
45	1573	108	142	7	0	0	257	0
46	354	114	252	0	0	0	366	0
47	997	378	2525	5	41	123	3072	0
48	527	2918	4099	0	3	122	7142	0
49	520	0	150	0	23	225	398	0
50	148	0	0	0	0	0	0	0
71	461	0	39	0	3	0	42	0
72	0	0	0	0	0	1632	1632	5152
73	1306	838	3261	237	474	7	4817	0
74	473	0	19	4	3	38	64	0
75	479	116	113	0	0	23	252	0
76	381	19	10	0	0	1	30	0
77	238	0	0	0	3	0	3	0
78	437	41	94	8	14	0	157	0
79	372	0	69	0	1	38	108	0
80	533	29	64	0	7	21	121	0
81	357	30	226	0	0	9	265	0
TOTAL	20572						27271	5152

APPENDIX: Travel, Average Speed, Corridor Level of Service

Northgate CTIP

Travel Time • Average Speed • Corridor Level of Service

Date: June 21, 2004

Travel Routes		Survey Results			2010 Results			2030 Results		
I.D.	Direction : NB/ EB	Travel Time (min)	Average Speed (mph)	LOS	Travel Time (min)	Average Speed (mph)	LOS	Travel Time (min)	Average Speed (mph)	LOS
1	NE 130th St/ NE 125th St - Meridian Ave to Lake City Way (EB)	7.74	15.31	D	8.81	15.11	D	9.49	14.00	E
2	Northgate Way - Meridian Ave to Lake City Way (EB)	7.44	13.04	E	9.68	11.13	E	11.88	9.06	F
3	Meridian Ave - NE 92nd St to NE 120th St (NB)	4.96	17.14	D	6.43	13.86	E	8.22	10.82	E
4	1st Ave - NE 92nd St to Northgate Way (NB)	4.21	13.14	E	4.43	12.43	E	4.60	11.93	E
5	5th Ave - Northgate Way to NE 130th St (NB)	2.84	21.24	C	2.88	20.93	C	2.95	20.42	C
5a	5th Ave - NE 85th St to Northgate Way (NB)	3.93	19.76	C	4.63	16.62	D	6.22	12.26	E
6	Roosevelt Way/Pinehurst - NE 85th St to NE 117th St (NB)	3.99	26.19	B	3.65	28.64	B	3.85	27.11	B
7	15th Ave NE - Northgate Way to NE 125th St (NB)	2.95	16.28	D	7.74	5.88	F	10.77	4.21	F
7a	15th Ave NE - NE 85th St to Northgate Way (NB)	3.63	20.79	C	3.74	20.21	C	3.89	19.39	C

Travel Routes		Survey Results			2010 Results			2030 Results		
I.D.	Direction : SB/ WB	Travel Time (min)	Average Speed (mph)	LOS	Travel Time (min)	Average Speed (mph)	LOS	Travel Time (min)	Average Speed (mph)	LOS
1	NE 130th St/ NE 125th St - Lake City Way to Meridian Ave (WB)	8.00	14.75	D	9.15	14.50	D	10.29	12.88	E
2	Northgate Way - Lake City Way to Meridian Ave (WB)	7.85	12.43	E	9.31	11.62	E	10.91	9.91	F
3	Meridian Ave - NE 120th St to NE 92nd St (SB)	3.85	21.81	C	4.24	20.89	C	5.80	15.28	D
4	1st Ave - Northgate Way to NE 92nd St (SB)	3.51	15.64	D	4.70	11.49	E	5.34	10.06	E
5	5th Ave - NE 130th St to Northgate Way (SB)	2.29	26.37	B	2.08	29.00	B	2.09	28.89	B
5a	5th Ave - Northgate Way to NE 85th St (SB)	3.48	21.76	C	3.89	19.49	C	4.02	18.81	C
6	Roosevelt Way/Pinehurst - NE 117th St to NE 85th St (SB)	4.50	23.02	C	4.23	24.50	B	5.53	18.72	C
7	15th Ave NE - NE 125th St to Northgate Way (SB)	2.28	19.84	C	2.32	19.51	C	2.38	19.02	C
7a	15th Ave NE - Northgate Way to NE 85th St (SB)	3.07	24.91	B	3.07	24.91	B	3.07	24.91	B

