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Appendix A

Applicable Codes and Regulations under Vesting Rules for Emerald Pointe on the Sound

Emerald Pointe Project
Applicable Plans and Regulations

This appendix identifies policies, standards and regulations that are applicable to the Emerald Pointe project based on vesting of the permit application for the project on February 15, 1990. This includes applicable SEPA regulations and policies, a summary explanation of the applicability of vested regulations and where current regulations may apply, and a chart showing the applicable regulations pertaining to each element of the environment that is analyzed in the EIS.

The following SEPA laws, regulations, and procedures apply to the project

- Revised Code of Washington (RCW) 43.21C currently in effect.
- Washington Administrative Code (WAC) 197-11 currently in effect.
- King County Code (KCC) 20.44 in effect on June 1, 1998 (as adopted by reference in Burien Municipal Code [BMC] 14.05.010) excluding KCC 20.44.080 (C) and (D).

The City has provided the following general comments regarding applicability of policies and regulations:

1. The project is vested to the 1990 Land Use regulations. However, regarding Health and Safety policies and regulations, current policies and regulations apply; this includes policies and regulations related to level of service for transportation.
2. SEPA mitigating measures necessary to mitigate environmental impacts remaining after applying any applicable regulations can still be required but are based on the vested 1990 regulations.
3. The proponent and City may agree in writing to use current regulations instead of vested regulations.
4. The current Burien Comprehensive Plan may be used as guidance but may not act as a substitute for development regulations. In cases where the current Comprehensive Plan and vested regulations are in conflict, the vested regulations supersede.
5. Procedural rules in effect at the time of vesting will be applied unless the applicant otherwise agrees to follow later enacted procedural rules.
6. The project is vested to the SEPA policies in place at the time of complete application. Therefore, the City may consider environmental impacts only in the context of the environmental regulations in place by King County in 1990 as well as SEPA as it existed at the time of vesting. Thus, approval or denial and mitigation standards must be based upon those 1990 policies to which the applicant has vested.

Policies, Standards, and Regulations pertaining to Elements of the Environment

EIS Section	Applicable Policies, Standards, and Regulations	Explanation
Transportation	• Current BMC 18.70 - Development Standards – Adequacy of Public Facilities and Services (except that concurrency requirements do not apply) • Current Burien Comprehensive Plan Transportation Element (2003 as amended) • Current Burien Transportation Improvement Program (2003) • Current Burien Pedestrian and Bicycle Facilities Plan (2004)	Transportation regulations relate to health and safety; and are therefore not vested. However, concurrency regulations do not vest. While impact mitigation fees do not vest, the City does not have an adopted impact fee ordinance and so no impact fees apply. Following are current City of Burien policies, standards, and regulations which are <u>not applicable</u>: • Concurrency standards contained in BMC 18.70 Adequacy of Public Facilities and Services
Drainage and Water Quality	• 2005 King County Surface Water Manual (2005 Manual), as agreed to in writing by the proponent. • Wetlands regulations contained in KCC 21.54 Special Control Areas in effect February 15, 1990 • Current Burien Comprehensive Plan Stormwater Element (2003 as amended) are used as guidance	Land use regulations are vested; however, the proponent and City may agree in writing to use current regulations instead of vested regulations.
Earth and Geotechnical	• KCC 21.54 Special Control Areas in effect Feb. 15, 1990 • KCC 16.82 Grading in effect Feb. 15, 1990 • Current International Building Code (IBC) adopted in the BMC by reference (as adopted by reference in Chapter 19.27 RCW).	Land use regulations are vested. However, building codes pertain to health and safety; and are therefore not vested. Following are current City of Burien policies, standards, and regulations which are <u>not applicable</u>: • Current Burien Zoning Code 19.40 Critical Areas • Current City of Burien Critical Areas Maps
Plants and Animals	• Wetlands regulations in KCC 21.54 Special Control Areas in effect Feb. 15, 1990 • KCC 21.51 Landscaping and Screening in effect Feb. 15, 1990	Land use regulations are vested. Following are current City of Burien policies, standards, and regulations which are <u>not applicable</u>: • Current Burien Zoning Code 19.40 Critical Areas • Current Burien Zoning Code 19.25 Tree Retention and Landscaping • Current City of Burien Critical Areas Maps
Wetlands	• Wetlands regulations in KCC 21.54 Special Control Areas in effect Feb. 15, 1990	Land Use regulations are vested. Following are current City of Burien policies, standards, and regulations which are <u>not applicable</u>:

EIS Section	Applicable Policies, Standards, and Regulations	Explanation
		• Current City of Burien Critical Areas Maps • Current Ecology 1997 Manual Wetland Definition/USACE 1987 Manual • Current City of Burien Critical Areas Ordinance definitions (including buffer definitions) • Washington Department of Ecology Wetland Rating System (2004)
Land Use (including Relationship to Plans and Policies)	• KCC 21.12 RM-2400 in effect Feb. 15, 1990 • KCC 21.14 RM-1800 in effect Feb. 15, 1990 • KCC 21.48 General Provisions – Height Yards, Area and Open Space in effect Feb. 15, 1990 • KCC 21.50 General Provisions - Loading Areas and Off Street Parking in effect Feb. 15, 1990 • KCC 21.51 Landscaping and Screening in effect Feb. 15, 1990 • Current Burien Comprehensive Plan (2003 as amended) is used as guidance except where vested regulations apply	Land use regulations are vested. Following are current City of Burien policies, standards, and regulations which are <u>not applicable</u>: • Burien Zoning Code 19.15.005 Single Family Residential Zones (The site's current zoning is RS-12,000; however, the vested King County regulations apply instead.)
Aesthetics, Light & Glare	• KCC 21.12.080 Height (RM-2400) in effect Feb. 15, 1990 • KCC 21.14.080 Height (RM-1800) in effect Feb. 15, 1990 • Current Burien Comprehensive Plan (2003 as amended) is used as guidance except where vested regulations apply	Building height is related to land use, and land use regulations are vested. Illumination standards are considered health and safety and are not vested; however, Burien does not have illumination standards for private development. Following are current City of Burien policies, standards, and regulations which are <u>not applicable</u>: • City of Burien Comprehensive Plan (as amended in 2003) – Community Character Element • Burien Zoning Code 19.15.005 Single Family Residential Zones (The site's current zoning is RS-12,000; however, the vested King County regulations apply instead.)
Noise	• Current BMC 9.105.400 Noise • Current BMC 12.30.1100 Exterior Noise Levels at Parks of Local or Regional Significance • Current WAC 173-60 Maximum Environmental Noise Levels	Noise relates to health and safety regulations; therefore, current noise regulations apply.
Parks and Recreation	• Current Burien Comprehensive Plan – Parks, Recreation and Open Space Element (2003 as amended) is used as guidance • Parks Recreation and Open Space Plan (2006) is used as guidance	No parks and open space regulations relating to the development of multi-family housing were in effect in King County on Feb. 15, 1990. Current plans and policies are used as guidance.

EIS Section	Applicable Policies, Standards, and Regulations	Explanation
	• Seahurst Park Master Plan (2002) is used as guidance • Pedestrian and Bicycle Facilities Plan (2004) is used as guidance	
Public Services • Police • Fire • School	• Current Highline School District Capital Facilities Plan • Current fire service certificate of availability is required.	Ability to provide services does not vest to old plans. Following are current City of Burien policies, standards, and regulations which are <u>not applicable</u>: • City of Burien Comprehensive Plan (2003) – Capital Facilities Element
Public Utilities • Sewer • Water • Solid Waste	• Current sewer and water certificates of availability are required.	Ability to provide services does not vest to old plans. Following are current City of Burien policies, standards, and regulations which are <u>not applicable</u>: • City of Burien Comprehensive Plan (2003) – Capital Facilities Element

Appendix B

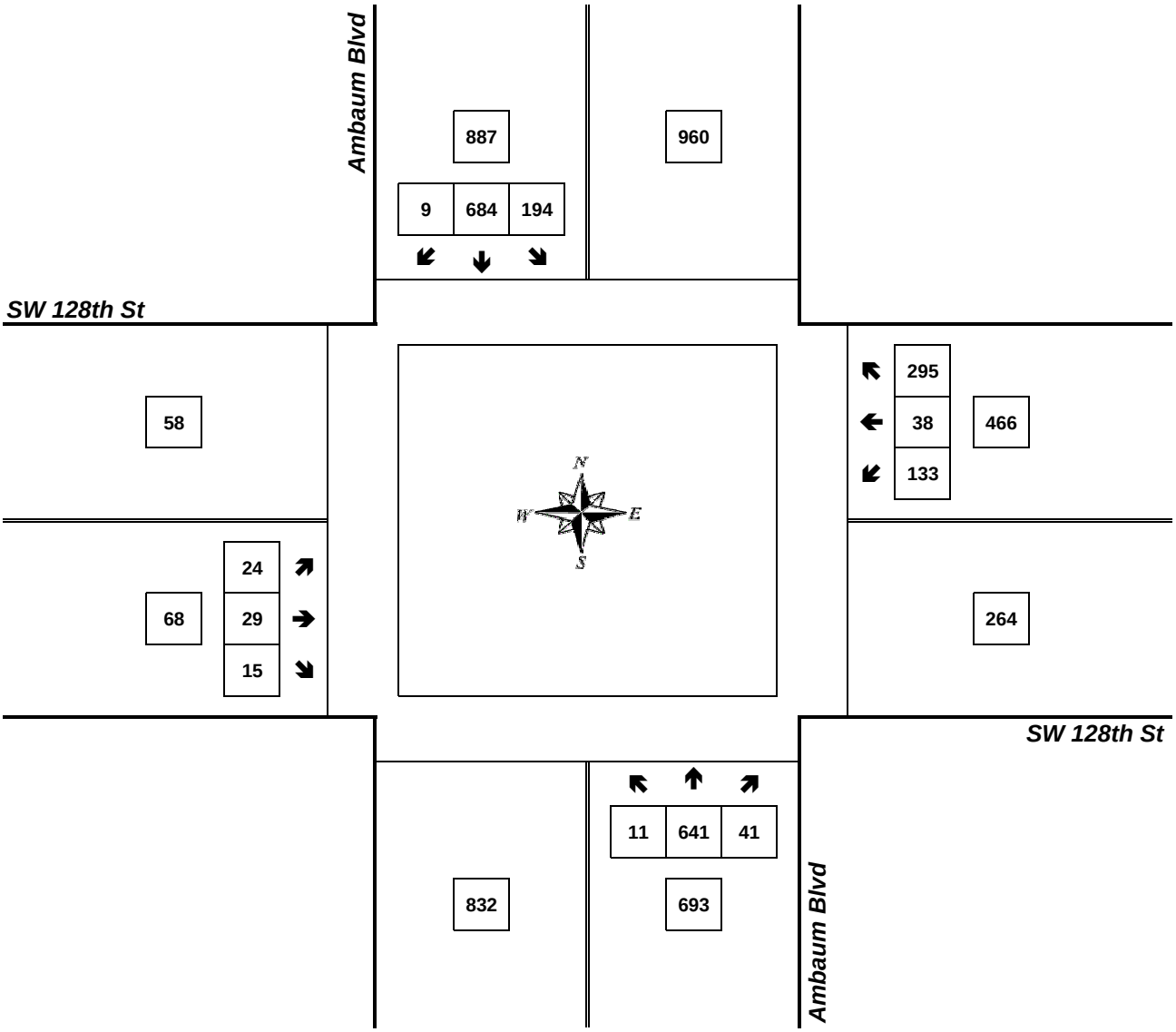
Traffic Volume Counts

Peak Hour Summary

Mark Skaggs
(206) 251-0300

Ambaum Blvd & SW 128th St

5:00 PM to 6:00 PM
Thursday, November 09, 2006

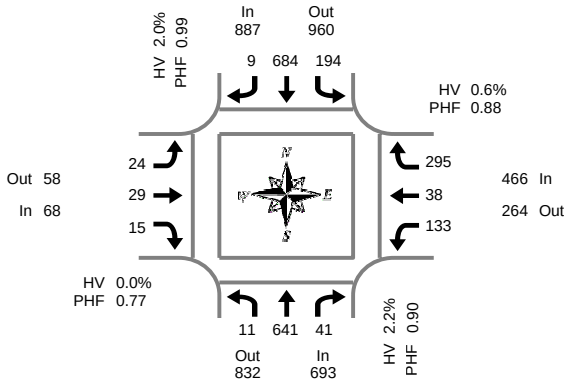


Approach	PHF	HV%	Volume
EB	0.77	0.0%	68
WB	0.88	0.6%	466
NB	0.90	2.2%	693
SB	0.99	2.0%	887
Intersection	0.97	1.7%	2,114

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

Mark Skaggs
(206) 251-0300



Peak Hour Summary
5:00 PM to 6:00 PM

Ambaum Blvd & SW 128th St

Thursday, November 09, 2006
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Ambaum Blvd				Southbound Ambaum Blvd				Eastbound SW 128th St				Westbound SW 128th St				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	3	133	12	3	59	145	5	8	7	1	6	1	28	11	56	3	466
4:15 PM	4	139	14	3	55	159	1	3	6	3	2	0	33	7	70	4	493
4:30 PM	1	137	11	4	62	176	4	5	10	10	4	0	33	8	51	0	507
4:45 PM	2	133	9	3	51	182	3	10	4	5	2	0	38	11	73	2	513
5:00 PM	3	164	7	7	46	176	3	3	1	7	2	0	38	5	72	0	524
5:15 PM	2	178	12	2	48	175	0	6	9	8	5	0	34	10	64	1	545
5:30 PM	3	156	13	4	45	170	4	5	6	10	6	0	30	10	71	1	524
5:45 PM	3	143	9	2	55	163	2	4	8	4	2	0	31	13	88	1	521
Total Survey	21	1,183	87	28	421	1,346	22	44	51	48	29	1	265	75	545	12	4,093

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Ambaum Blvd				Southbound Ambaum Blvd				Eastbound SW 128th St				Westbound SW 128th St				Total
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	
Volume	693	832	1,525	15	887	960	1,847	18	68	58	126	0	466	264	730	3	2,114
%HV	2.2%				2.0%				0.0%				0.6%				1.7%
PHF	0.90				0.99				0.77				0.88				0.97

By Movement	Northbound Ambaum Blvd				Southbound Ambaum Blvd				Eastbound SW 128th St				Westbound SW 128th St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	11	641	41	693	194	684	9	887	24	29	15	68	133	38	295	466	2,114
PHF	0.92	0.90	0.79	0.90	0.88	0.97	0.56	0.99	0.67	0.73	0.63	0.77	0.88	0.73	0.84	0.88	0.97

Rolling Hour Summary
4:00 PM to 6:00 PM

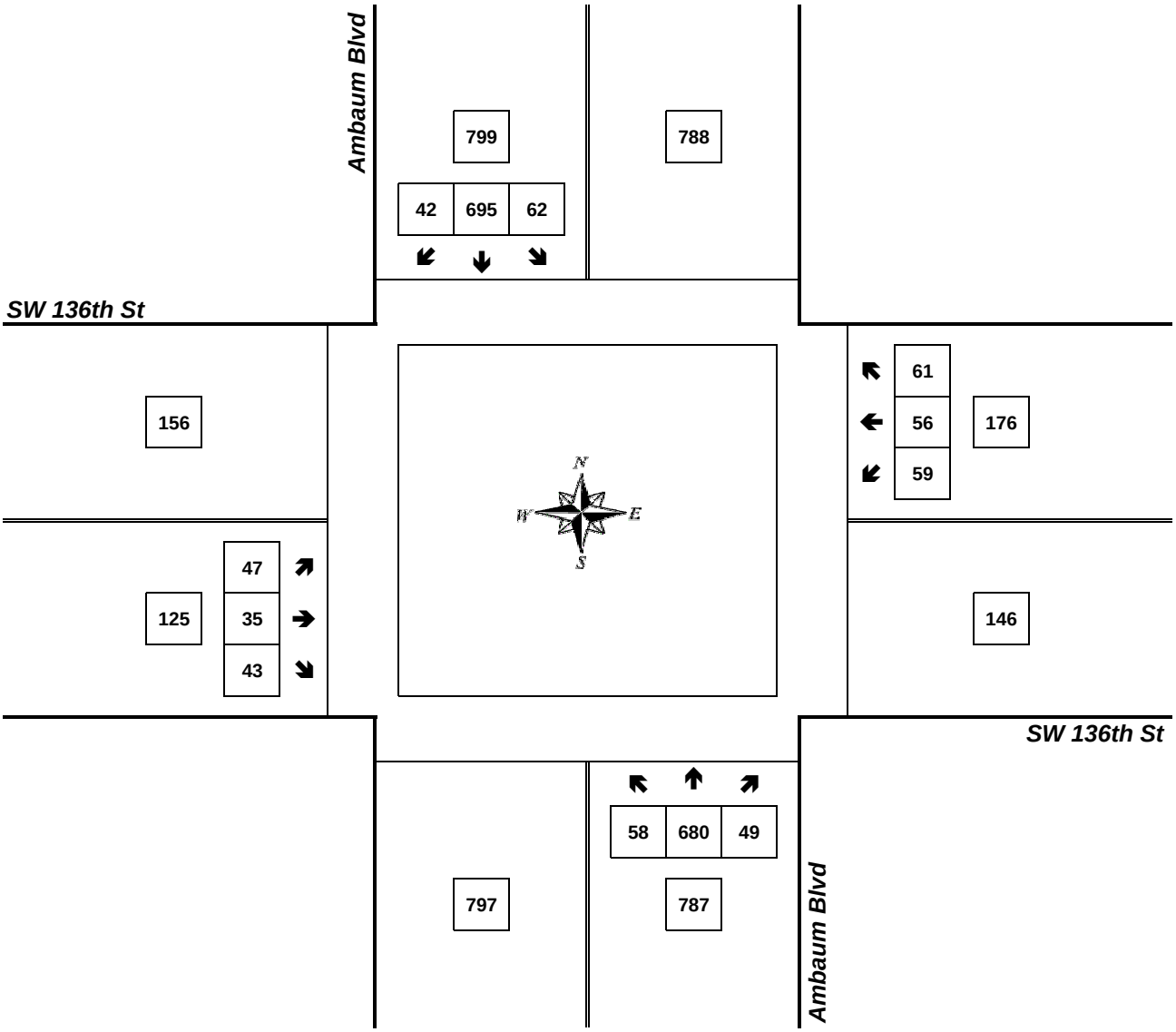
Interval Start Time	Northbound Ambaum Blvd				Southbound Ambaum Blvd				Eastbound SW 128th St				Westbound SW 128th St				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	10	542	46	13	227	662	13	26	27	19	14	1	132	37	250	9	1,979
4:15 PM	10	573	41	17	214	693	11	21	21	25	10	0	142	31	266	6	2,037
4:30 PM	8	612	39	16	207	709	10	24	24	30	13	0	143	34	260	3	2,089
4:45 PM	10	631	41	16	190	703	10	24	20	30	15	0	140	36	280	4	2,106
5:00 PM	11	641	41	15	194	684	9	18	24	29	15	0	133	38	295	3	2,114

Peak Hour Summary

Mark Skaggs
(206) 251-0300

Ambaum Blvd & SW 136th St

4:30 PM to 5:30 PM
Thursday, November 09, 2006

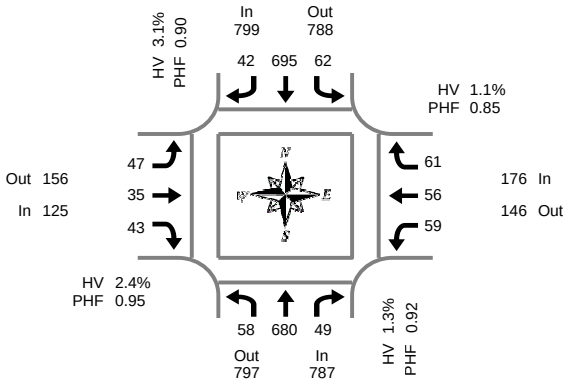


Approach	PHF	HV%	Volume
EB	0.95	2.4%	125
WB	0.85	1.1%	176
NB	0.92	1.3%	787
SB	0.90	3.1%	799
Intersection	0.93	2.1%	1,887

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

Mark Skaggs
(206) 251-0300



Peak Hour Summary
4:30 PM to 5:30 PM

Ambaum Blvd & SW 136th St

Thursday, November 09, 2006
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Ambaum Blvd				Southbound Ambaum Blvd				Eastbound SW 136th St				Westbound SW 136th St				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	9	173	9	4	13	169	9	8	16	6	13	2	13	11	20	1	461
4:15 PM	13	157	11	2	19	172	13	8	17	8	3	6	14	15	15	2	457
4:30 PM	17	168	7	3	12	174	11	7	11	6	15	1	14	17	13	1	465
4:45 PM	16	144	17	1	10	179	11	10	14	10	9	2	10	15	14	0	449
5:00 PM	9	183	11	4	21	185	15	3	9	14	7	0	22	15	15	1	506
5:15 PM	16	185	14	2	19	157	5	5	13	5	12	0	13	9	19	0	467
5:30 PM	9	163	7	5	13	164	6	4	11	8	6	0	18	11	20	1	436
5:45 PM	7	166	8	3	12	178	12	4	12	6	7	0	11	14	15	0	448
Total Survey	96	1,339	84	24	119	1,378	82	49	103	63	72	11	115	107	131	6	3,689

Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound Ambaum Blvd				Southbound Ambaum Blvd				Eastbound SW 136th St				Westbound SW 136th St				Total
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	
Volume	787	797	1,584	10	799	788	1,587	25	125	156	281	3	176	146	322	2	1,887
%HV	1.3%				3.1%				2.4%				1.1%				2.1%
PHF	0.92				0.90				0.95				0.85				0.93

By Movement	Northbound Ambaum Blvd				Southbound Ambaum Blvd				Eastbound SW 136th St				Westbound SW 136th St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	58	680	49	787	62	695	42	799	47	35	43	125	59	56	61	176	1,887
PHF	0.85	0.92	0.72	0.92	0.74	0.94	0.70	0.90	0.84	0.63	0.72	0.95	0.67	0.82	0.80	0.85	0.93

Rolling Hour Summary
4:00 PM to 6:00 PM

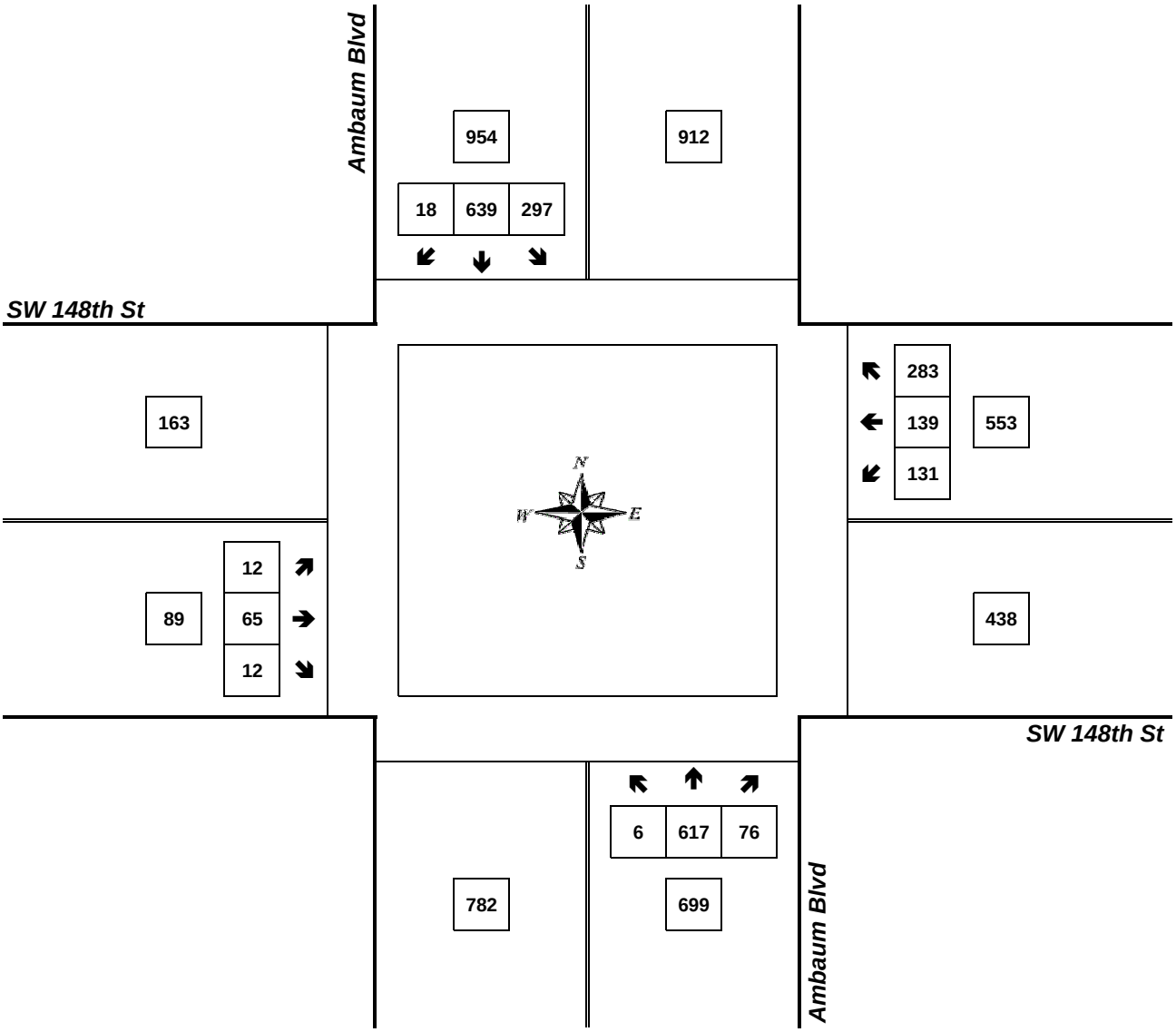
Interval Start Time	Northbound Ambaum Blvd				Southbound Ambaum Blvd				Eastbound SW 136th St				Westbound SW 136th St				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	55	642	44	10	54	694	44	33	58	30	40	11	51	58	62	4	1,832
4:15 PM	55	652	46	10	62	710	50	28	51	38	34	9	60	62	57	4	1,877
4:30 PM	58	680	49	10	62	695	42	25	47	35	43	3	59	56	61	2	1,887
4:45 PM	50	675	49	12	63	685	37	22	47	37	34	2	63	50	68	2	1,858
5:00 PM	41	697	40	14	65	684	38	16	45	33	32	0	64	49	69	2	1,857

Peak Hour Summary

Mark Skaggs
(206) 251-0300

Ambaum Blvd & SW 148th St

4:30 PM to 5:30 PM
Thursday, November 09, 2006

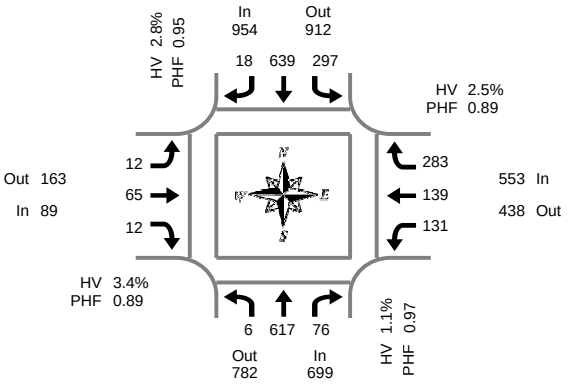


Approach	PHF	HV%	Volume
EB	0.89	3.4%	89
WB	0.89	2.5%	553
NB	0.97	1.1%	699
SB	0.95	2.8%	954
Intersection	0.96	2.3%	2,295

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

Mark Skaggs
(206) 251-0300



Peak Hour Summary
4:30 PM to 5:30 PM

Ambaum Blvd & SW 148th St

Thursday, November 09, 2006
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Ambaum Blvd				Southbound Ambaum Blvd				Eastbound SW 148th St				Westbound SW 148th St				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	2	146	18	3	64	125	3	11	2	19	6	0	25	33	68	4	511
4:15 PM	3	134	23	3	63	156	5	7	6	15	3	1	34	31	69	2	542
4:30 PM	1	156	17	2	87	162	3	8	2	20	3	1	33	21	59	4	564
4:45 PM	2	156	18	2	79	159	4	7	4	16	4	1	34	32	64	3	572
5:00 PM	2	161	18	2	74	162	6	6	3	15	4	0	37	47	70	5	599
5:15 PM	1	144	23	2	57	156	5	6	3	14	1	1	27	39	90	2	560
5:30 PM	3	115	14	3	71	149	5	5	2	25	2	1	27	30	64	7	507
5:45 PM	3	121	14	2	69	132	2	4	8	20	5	0	32	34	84	3	524
Total Survey	17	1,133	145	19	564	1,201	33	54	30	144	28	5	249	267	568	30	4,379

Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound Ambaum Blvd				Southbound Ambaum Blvd				Eastbound SW 148th St				Westbound SW 148th St				Total
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	
Volume	699	782	1,481	8	954	912	1,866	27	89	163	252	3	553	438	991	14	2,295
%HV	1.1%				2.8%				3.4%				2.5%				2.3%
PHF	0.97				0.95				0.89				0.89				0.96

By Movement	Northbound Ambaum Blvd				Southbound Ambaum Blvd				Eastbound SW 148th St				Westbound SW 148th St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	6	617	76	699	297	639	18	954	12	65	12	89	131	139	283	553	2,295
PHF	0.75	0.96	0.83	0.97	0.85	0.99	0.75	0.95	0.75	0.81	0.75	0.89	0.89	0.74	0.79	0.89	0.96

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Ambaum Blvd				Southbound Ambaum Blvd				Eastbound SW 148th St				Westbound SW 148th St				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	8	592	76	10	293	602	15	33	14	70	16	3	126	117	260	13	2,189
4:15 PM	8	607	76	9	303	639	18	28	15	66	14	3	138	131	262	14	2,277
4:30 PM	6	617	76	8	297	639	18	27	12	65	12	3	131	139	283	14	2,295
4:45 PM	8	576	73	9	281	626	20	24	12	70	11	3	125	148	288	17	2,238
5:00 PM	9	541	69	9	271	599	18	21	16	74	12	2	123	150	308	17	2,190

Appendix C

Transportation LOS Criteria and Definitions

Highway Capacity Manual, 2000

Signalized intersection level of service (LOS) is defined in terms of the average total vehicle delay of all movements through an intersection. Vehicle delay is a method of quantifying several intangible factors, including driver discomfort, frustration, and lost travel time. Specifically, LOS criteria are stated in terms of average delay per vehicle during a specified time period (for example, the PM peak hour). Vehicle delay is a complex measure based on many variables, including signal phasing (i.e., progression of movements through the intersection), signal cycle length, and traffic volumes with respect to intersection capacity. Table 1 shows LOS criteria for signalized intersections, as described in the *Highway Capacity Manual* (Transportation Research Board, Special Report 209, 2000).

Table 1. Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (sec/veh)	General Description (Signalized Intersections)
A	≤10	Free Flow
B	>10 - 20	Stable Flow (slight delays)
C	>20 - 35	Stable flow (acceptable delays)
D	>35 - 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 - 80	Unstable flow (intolerable delay)
F	>80	Forced flow (jammed)

Unsignalized intersection LOS criteria can be further reduced into two intersection types: all-way stop-controlled and two-way stop-controlled. All-way, stop-controlled intersection LOS is expressed in terms of the average vehicle delay of all of the movements, much like that of a signalized intersection. Two-way, stop-controlled intersection LOS is defined in terms of the average vehicle delay of an individual movement(s). This is because the performance of a two-way, stop-controlled intersection is more closely reflected in terms of its individual movements, rather than its performance overall. For this reason, LOS for a two-way, stop-controlled intersection is defined in terms of its individual movements. With this in mind, total average vehicle delay (i.e., average delay of all movements) for a two-way, stop-controlled intersection should be viewed with discretion. Table 2 shows LOS criteria for unsignalized intersections (both all-way and two-way, stop-controlled).

Table 2. Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (sec/veh)
A	0 - 10
B	>10 - 15
C	>15 - 25
D	>25 - 35
E	>35 - 50
F	>50

Appendix D

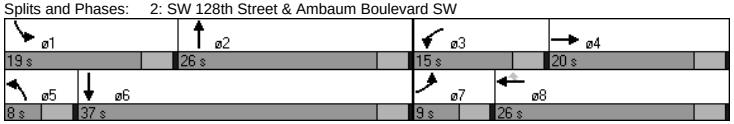
Intersection LOS Worksheets

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	30	15	135	40	300	10	655	40	200	700	10
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Detector Phases	7	4		3	8	8	5	2		1	6	
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	8.0	20.0		8.0	20.0	20.0	8.0	20.0		8.0	20.0	
Total Split (s)	9.0	20.0	0.0	15.0	26.0	26.0	8.0	26.0	0.0	19.0	37.0	0.0
Total Split (%)	11.3%	25.0%	0.0%	18.8%	32.5%	32.5%	10.0%	32.5%	0.0%	23.8%	46.3%	0.0%
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5		0.5	0.5	0.5	0.5	0.5		0.5	0.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 48 (60%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 2: SW 128th Street & Ambaum Boulevard SW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	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	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1807		1787	1881	1599	1770	3509		1770	3532	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1805	1807		1787	1881	1599	1770	3509		1770	3532	
Volume (vph)	25	30	15	135	40	300	10	655	40	200	700	10
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	26	31	15	139	41	309	10	675	41	206	722	10
RTOR Reduction (vph)	0	14	0	0	0	257	0	5	0	0	1	0
Lane Group Flow (vph)	26	32	0	139	41	52	10	711	0	206	731	0
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	2.0	5.5		9.9	13.4	13.4	1.4	34.0		14.6	47.2	
Effective Green, g (s)	2.0	5.5		9.9	13.4	13.4	1.4	34.0		14.6	47.2	
Actuated g/C Ratio	0.02	0.07		0.12	0.17	0.17	0.02	0.42		0.18	0.59	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	45	124		221	315	268	31	1491		323	2084	
v/s Ratio Prot	0.01	0.02		c0.08	0.02		0.01	c0.20		c0.12	0.21	
v/s Ratio Perm						c0.03						
v/c Ratio	0.58	0.26		0.63	0.13	0.19	0.32	0.48		0.64	0.35	
Uniform Delay, d1	38.6	35.3		33.3	28.3	28.6	38.8	16.6		30.3	8.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.42	0.75		1.00	1.00	
Incremental Delay, d2	16.7	1.1		5.5	0.2	0.4	5.8	1.1		4.1	0.5	
Delay (s)	55.3	36.4		38.8	28.5	29.0	60.7	13.5		34.4	8.9	
Level of Service	E	D		D	C	C	E	B		C	A	
Approach Delay (s)		43.2			31.8			14.1			14.5	
Approach LOS		D			C			B			B	

Intersection Summary

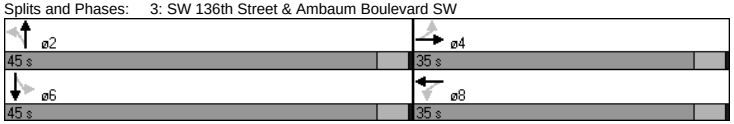
HCM Average Control Delay	19.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	35	45	60	55	60	60	695	50	65	710	45
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phases	4	4		8	8		2	2		6	6	
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	35.0	35.0	0.0	35.0	35.0	0.0	45.0	45.0	0.0	45.0	45.0	0.0
Total Split (%)	43.8%	43.8%	0.0%	43.8%	43.8%	0.0%	56.3%	56.3%	0.0%	56.3%	56.3%	0.0%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.5	0.5		0.5	0.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated

Splits and Phases: 3: SW 136th Street & Ambaum Boulevard SW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		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	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	0.92		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1707		1787	1733		1787	3538		1752	3474	
Flt Permitted	0.56	1.00		0.70	1.00		0.34	1.00		0.34	1.00	
Satd. Flow (perm)	1041	1707		1319	1733		641	3538		636	3474	
Volume (vph)	50	35	45	60	55	60	60	695	50	65	710	45
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	54	38	48	65	59	65	65	747	54	70	763	48
RTOR Reduction (vph)	0	43	0	0	59	0	0	3	0	0	2	0
Lane Group Flow (vph)	54	43	0	65	65	0	65	798	0	70	809	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	3%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.7	7.7		7.7	7.7		64.3	64.3		64.3	64.3	
Effective Green, g (s)	7.7	7.7		7.7	7.7		64.3	64.3		64.3	64.3	
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.80	0.80		0.80	0.80	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	100	164		127	167		515	2844		511	2792	
v/s Ratio Prot		0.02			0.04			0.23			c0.23	
v/s Ratio Perm	c0.05			0.05			0.10			0.11		
v/c Ratio	0.54	0.26		0.51	0.39		0.13	0.28		0.14	0.29	
Uniform Delay, d1	34.5	33.5		34.4	33.9		1.7	2.0		1.7	2.0	
Progression Factor	1.00	1.00		1.00	1.00		3.26	3.57		0.71	0.72	
Incremental Delay, d2	5.8	0.8		3.5	1.5		0.4	0.2		0.5	0.2	
Delay (s)	40.3	34.4		37.8	35.5		6.0	7.3		1.8	1.7	
Level of Service	D	C		D	D		A	A		A	A	
Approach Delay (s)		36.6			36.3			7.2			1.7	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	9.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

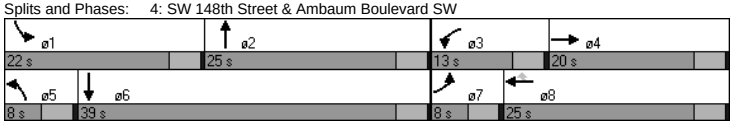
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	65	10	135	140	290	5	630	80	305	650	20
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Detector Phases	7	4		3	8	8	5	2		1	6	
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	8.0	20.0		8.0	20.0	20.0	8.0	20.0		8.0	20.0	
Total Split (s)	8.0	20.0	0.0	13.0	25.0	25.0	8.0	25.0	0.0	22.0	39.0	0.0
Total Split (%)	10.0%	25.0%	0.0%	16.3%	31.3%	31.3%	10.0%	31.3%	0.0%	27.5%	48.8%	0.0%
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5		0.5	0.5	0.5	0.5	0.5		0.5	0.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 48 (60%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 4: SW 148th Street & Ambaum Boulevard SW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	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	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1809		1752	1845	1568	1787	3514		1752	3489	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1809		1752	1845	1568	1787	3514		1752	3489	
Volume (vph)	10	65	10	135	140	290	5	630	80	305	650	20
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	68	10	141	146	302	5	656	83	318	677	21
RTOR Reduction (vph)	0	7	0	0	0	236	0	11	0	0	2	0
Lane Group Flow (vph)	10	71	0	141	146	66	5	728	0	318	696	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	3%	3%	3%
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	0.8	9.7		8.7	17.6	17.6	1.3	25.9		19.7	44.3	
Effective Green, g (s)	0.8	9.7		8.7	17.6	17.6	1.3	25.9		19.7	44.3	
Actuated g/C Ratio	0.01	0.12		0.11	0.22	0.22	0.02	0.32		0.25	0.55	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	18	219		191	406	345	29	1138		431	1932	
v/s Ratio Prot	0.01	0.04		c0.08	c0.08		0.00	c0.21		c0.18	0.20	
v/s Ratio Perm						0.04						
v/c Ratio	0.56	0.32		0.74	0.36	0.19	0.17	0.64		0.74	0.36	
Uniform Delay, d1	39.4	32.2		34.5	26.4	25.4	38.8	23.1		27.8	9.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.03	1.33	
Incremental Delay, d2	32.3	0.9		13.8	0.5	0.3	2.8	2.8		6.4	0.5	
Delay (s)	71.7	33.0		48.4	27.0	25.7	41.6	25.8		35.0	13.7	
Level of Service	E	C		D	C	C	D	C		C	B	
Approach Delay (s)		37.4			31.4			25.9			20.4	
Approach LOS		D			C			C			C	

Intersection Summary

HCM Average Control Delay	25.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

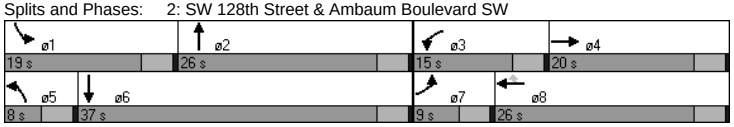
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	25	30	145	40	320	10	695	210	745
Turn Type	Prot		Prot		Perm	Prot		Prot	
Protected Phases	7	4	3	8		5	2	1	6
Permitted Phases					8				
Detector Phases	7	4	3	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	9.0	20.0	15.0	26.0	26.0	8.0	26.0	19.0	37.0
Total Split (%)	11.3%	25.0%	18.8%	32.5%	32.5%	10.0%	32.5%	23.8%	46.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 36 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 2: SW 128th Street & Ambaum Boulevard SW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	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	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1807		1787	1881	1599	1770	3510		1770	3532	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1805	1807		1787	1881	1599	1770	3510		1770	3532	
Volume (vph)	25	30	15	145	40	320	10	695	40	210	745	10
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	26	31	15	149	41	330	10	716	41	216	768	10
RTOR Reduction (vph)	0	14	0	0	0	274	0	4	0	0	1	0
Lane Group Flow (vph)	26	32	0	149	41	56	10	753	0	216	777	0
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	2.0	5.5		10.1	13.6	13.6	1.4	33.2		15.2	47.0	
Effective Green, g (s)	2.0	5.5		10.1	13.6	13.6	1.4	33.2		15.2	47.0	
Actuated g/C Ratio	0.02	0.07		0.13	0.17	0.17	0.02	0.42		0.19	0.59	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	45	124		226	320	272	31	1457		336	2075	
v/s Ratio Prot	0.01	0.02		c0.08	0.02		0.01	c0.21		c0.12	0.22	
v/s Ratio Perm						c0.04						
v/c Ratio	0.58	0.26		0.66	0.13	0.21	0.32	0.52		0.64	0.37	
Uniform Delay, d1	38.6	35.3		33.3	28.2	28.6	38.8	17.4		29.9	8.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.21	0.39		1.00	1.00	
Incremental Delay, d2	16.7	1.1		6.8	0.2	0.4	5.8	1.3		4.2	0.5	
Delay (s)	55.3	36.4		40.1	28.4	28.9	52.7	8.0		34.1	9.2	
Level of Service	E	D		D	C	C	D	A		C	A	
Approach Delay (s)		43.2			32.1			8.6			14.6	
Approach LOS		D			C			A			B	

Intersection Summary

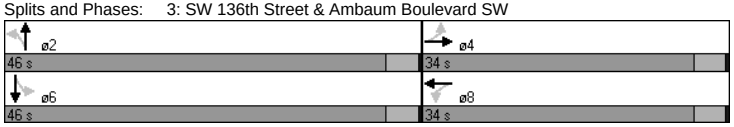
HCM Average Control Delay	17.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	55	35	65	60	65	740	70	755
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	34.0	34.0	34.0	34.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	57.5%	57.5%	57.5%	57.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 1 (1%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated

Splits and Phases: 3: SW 136th Street & Ambaum Boulevard SW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		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	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	0.92		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1699		1787	1735		1787	3537		1752	3472	
Flt Permitted	0.52	1.00		0.70	1.00		0.32	1.00		0.32	1.00	
Satd. Flow (perm)	962	1699		1312	1735		602	3537		598	3472	
Volume (vph)	55	35	50	65	60	65	65	740	55	70	755	50
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	59	38	54	70	65	70	70	796	59	75	812	54
RTOR Reduction (vph)	0	49	0	0	63	0	0	3	0	0	3	0
Lane Group Flow (vph)	59	43	0	70	72	0	70	852	0	75	863	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	3%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.0	8.0		8.0	8.0		64.0	64.0		64.0	64.0	
Effective Green, g (s)	8.0	8.0		8.0	8.0		64.0	64.0		64.0	64.0	
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.80	0.80		0.80	0.80	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	96	170		131	174		482	2830		478	2778	
v/s Ratio Prot		0.03			0.04			0.24			c0.25	
v/s Ratio Perm	c0.06			0.05			0.12			0.13		
v/c Ratio	0.61	0.26		0.53	0.41		0.15	0.30		0.16	0.31	
Uniform Delay, d1	34.5	33.2		34.2	33.8		1.8	2.1		1.8	2.1	
Progression Factor	1.00	1.00		1.00	1.00		0.23	0.27		0.28	0.36	
Incremental Delay, d2	11.1	0.8		4.1	1.6		0.5	0.2		0.7	0.3	
Delay (s)	45.6	34.0		38.4	35.4		0.9	0.8		1.2	1.0	
Level of Service	D	C		D	D		A	A		A	A	
Approach Delay (s)		38.6			36.4			0.8			1.0	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	6.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

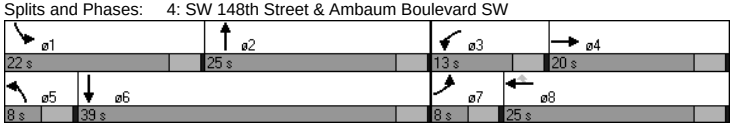
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	10	70	145	150	310	5	670	325	690
Turn Type	Prot		Prot		Perm	Prot		Prot	
Protected Phases	7	4	3	8		5	2	1	6
Permitted Phases					8				
Detector Phases	7	4	3	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	8.0	20.0	13.0	25.0	25.0	8.0	25.0	22.0	39.0
Total Split (%)	10.0%	25.0%	16.3%	31.3%	31.3%	10.0%	31.3%	27.5%	48.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 68 (85%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 4: SW 148th Street & Ambaum Boulevard SW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	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	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1811		1752	1845	1568	1787	3514		1752	3490	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1811		1752	1845	1568	1787	3514		1752	3490	
Volume (vph)	10	70	10	145	150	310	5	670	85	325	690	20
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	73	10	151	156	323	5	698	89	339	719	21
RTOR Reduction (vph)	0	7	0	0	0	250	0	12	0	0	2	0
Lane Group Flow (vph)	10	76	0	151	156	73	5	775	0	339	738	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	3%	3%	3%
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	0.8	9.9		8.9	18.0	18.0	1.3	24.5		20.7	43.9	
Effective Green, g (s)	0.8	9.9		8.9	18.0	18.0	1.3	24.5		20.7	43.9	
Actuated g/C Ratio	0.01	0.12		0.11	0.22	0.22	0.02	0.31		0.26	0.55	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	18	224		195	415	353	29	1076		453	1915	
v/s Ratio Prot	0.01	0.04		c0.09	c0.08		0.00	c0.22		c0.19	0.21	
v/s Ratio Perm						0.05						
v/c Ratio	0.56	0.34		0.77	0.38	0.21	0.17	0.72		0.75	0.39	
Uniform Delay, d1	39.4	32.1		34.6	26.2	25.2	38.8	24.7		27.3	10.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.12	0.71	
Incremental Delay, d2	32.3	0.9		17.3	0.6	0.3	2.8	4.2		6.5	0.6	
Delay (s)	71.7	33.0		51.8	26.8	25.5	41.6	28.9		37.1	7.9	
Level of Service	E	C		D	C	C	D	C		D	A	
Approach Delay (s)		37.1			32.1			29.0			17.1	
Approach LOS		D			C			C			B	

Intersection Summary

HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	3	140	170	59	30	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	3	151	183	63	32	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			364			
pX, platoon unblocked						
vC, conflicting volume	246				372	215
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	246				372	215
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	1320				632	831

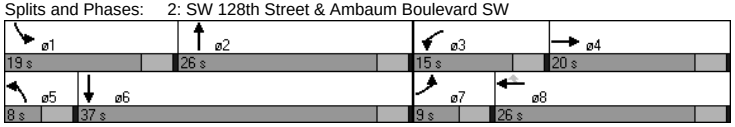
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	154	246	33
Volume Left	3	0	32
Volume Right	0	63	1
cSH	1320	1700	636
Volume to Capacity	0.00	0.14	0.05
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.2	0.0	11.0
Lane LOS	A		B
Approach Delay (s)	0.2	0.0	11.0
Approach LOS			B

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		22.5%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	25	30	159	40	320	11	701	210	758
Turn Type	Prot		Prot		Perm	Prot		Prot	
Protected Phases	7	4	3	8		5	2	1	6
Permitted Phases					8				
Detector Phases	7	4	3	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	9.0	20.0	15.0	26.0	26.0	8.0	26.0	19.0	37.0
Total Split (%)	11.3%	25.0%	18.8%	32.5%	32.5%	10.0%	32.5%	23.8%	46.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 36 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 2: SW 128th Street & Ambaum Boulevard SW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	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	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1803		1787	1881	1599	1770	3506		1770	3533	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1805	1803		1787	1881	1599	1770	3506		1770	3533	
Volume (vph)	25	30	16	159	40	320	11	701	47	210	758	10
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	26	31	16	164	41	330	11	723	48	216	781	10
RTOR Reduction (vph)	0	15	0	0	0	273	0	5	0	0	1	0
Lane Group Flow (vph)	26	32	0	164	41	57	11	766	0	216	790	0
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	2.0	5.5		10.4	13.9	13.9	1.5	32.9		15.2	46.6	
Effective Green, g (s)	2.0	5.5		10.4	13.9	13.9	1.5	32.9		15.2	46.6	
Actuated g/C Ratio	0.02	0.07		0.13	0.17	0.17	0.02	0.41		0.19	0.58	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	45	124		232	327	278	33	1442		336	2058	
v/s Ratio Prot	0.01	0.02		c0.09	0.02		0.01	c0.22		c0.12	0.22	
v/s Ratio Perm						c0.04						
v/c Ratio	0.58	0.26		0.71	0.13	0.21	0.33	0.53		0.64	0.38	
Uniform Delay, d1	38.6	35.3		33.3	27.9	28.3	38.8	17.7		29.9	9.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.21	0.39		1.00	1.00	
Incremental Delay, d2	16.7	1.1		9.4	0.2	0.4	5.7	1.4		4.2	0.5	
Delay (s)	55.3	36.4		42.8	28.1	28.7	52.6	8.3		34.1	9.5	
Level of Service	E	D		D	C	C	D	A		C	A	
Approach Delay (s)		43.1			33.0			8.9			14.8	
Approach LOS		D			C			A			B	

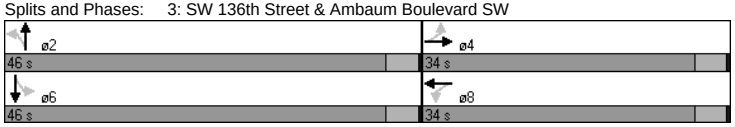
Intersection Summary			
HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	69	37	65	63	93	740	70	755
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	34.0	34.0	34.0	34.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	57.5%	57.5%	57.5%	57.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 1 (1%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 3: SW 136th Street & Ambaum Boulevard SW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		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	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	0.92		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1686		1787	1738		1787	3537		1752	3456	
Flt Permitted	0.52	1.00		0.64	1.00		0.31	1.00		0.32	1.00	
Satd. Flow (perm)	962	1686		1199	1738		580	3537		596	3456	
Volume (vph)	69	37	64	65	63	65	93	740	55	70	755	78
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	74	40	69	70	68	70	100	796	59	75	812	84
RTOR Reduction (vph)	0	62	0	0	63	0	0	3	0	0	4	0
Lane Group Flow (vph)	74	47	0	70	75	0	100	852	0	75	892	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	3%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.5	8.5		8.5	8.5		63.5	63.5		63.5	63.5	
Effective Green, g (s)	8.5	8.5		8.5	8.5		63.5	63.5		63.5	63.5	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.79	0.79		0.79	0.79	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	102	179		127	185		460	2807		473	2743	
v/s Ratio Prot		0.03			0.04			0.24			c0.26	
v/s Ratio Perm	c0.08			0.06			0.17			0.13		
v/c Ratio	0.73	0.26		0.55	0.41		0.22	0.30		0.16	0.33	
Uniform Delay, d1	34.6	32.9		33.9	33.4		2.1	2.2		1.9	2.3	
Progression Factor	1.00	1.00		1.00	1.00		0.49	0.29		0.31	0.38	
Incremental Delay, d2	22.4	0.8		5.1	1.5		0.9	0.2		0.7	0.3	
Delay (s)	57.0	33.7		39.0	34.9		1.9	0.9		1.3	1.2	
Level of Service	E	C		D	C		A	A		A	A	
Approach Delay (s)		43.1			36.3			1.0			1.2	
Approach LOS		D			D			A			A	

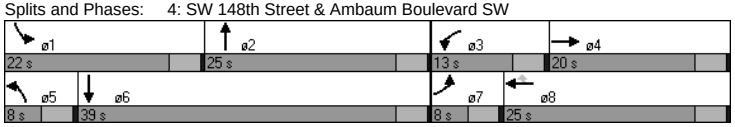
Intersection Summary			
HCM Average Control Delay	7.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	12	70	145	150	326	5	680	333	695
Turn Type	Prot		Prot		Perm	Prot		Prot	
Protected Phases	7	4	3	8		5	2	1	6
Permitted Phases					8				
Detector Phases	7	4	3	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	8.0	20.0	13.0	25.0	25.0	8.0	25.0	22.0	39.0
Total Split (%)	10.0%	25.0%	16.3%	31.3%	31.3%	10.0%	31.3%	27.5%	48.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 68 (85%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 4: SW 148th Street & Ambaum Boulevard SW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	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	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1811		1752	1845	1568	1787	3514		1752	3489	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1811		1752	1845	1568	1787	3514		1752	3489	
Volume (vph)	12	70	10	145	150	326	5	680	85	333	695	21
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	12	73	10	151	156	340	5	708	89	347	724	22
RTOR Reduction (vph)	0	7	0	0	0	264	0	11	0	0	2	0
Lane Group Flow (vph)	12	76	0	151	156	77	5	786	0	347	744	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	3%	3%	3%
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	0.8	9.9		8.9	18.0	18.0	1.3	24.1		21.1	43.9	
Effective Green, g (s)	0.8	9.9		8.9	18.0	18.0	1.3	24.1		21.1	43.9	
Actuated g/C Ratio	0.01	0.12		0.11	0.22	0.22	0.02	0.30		0.26	0.55	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	18	224		195	415	353	29	1059		462	1915	
v/s Ratio Prot	0.01	0.04		c0.09	c0.08		0.00	c0.22		c0.20	0.21	
v/s Ratio Perm						0.05						
v/c Ratio	0.67	0.34		0.77	0.38	0.22	0.17	0.74		0.75	0.39	
Uniform Delay, d1	39.5	32.1		34.6	26.2	25.3	38.8	25.2		27.0	10.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.11	0.71	
Incremental Delay, d2	66.1	0.9		17.3	0.6	0.3	2.8	4.7		6.6	0.6	
Delay (s)	105.6	33.0		51.8	26.8	25.6	41.6	29.9		36.7	7.9	
Level of Service	F	C		D	C	C	D	C		D	A	
Approach Delay (s)		42.1			32.0			29.9			17.0	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM Average Control Delay	25.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	4	140	170	66	33	2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	151	183	71	35	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			364			
pX, platoon unblocked						
vC, conflicting volume	254				377	218
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	254				377	218
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	100
cM capacity (veh/h)	1311				626	827

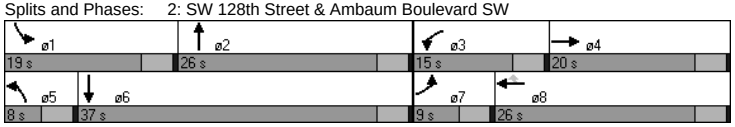
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	155	254	38
Volume Left	4	0	35
Volume Right	0	71	2
cSH	1311	1700	635
Volume to Capacity	0.00	0.15	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.2	0.0	11.0
Lane LOS	A		B
Approach Delay (s)	0.2	0.0	11.0
Approach LOS			B

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		23.0%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	25	30	160	40	320	11	702	210	760
Turn Type	Prot		Prot		Perm	Prot		Prot	
Protected Phases	7	4	3	8		5	2	1	6
Permitted Phases					8				
Detector Phases	7	4	3	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	9.0	20.0	15.0	26.0	26.0	8.0	26.0	19.0	37.0
Total Split (%)	11.3%	25.0%	18.8%	32.5%	32.5%	10.0%	32.5%	23.8%	46.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 36 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 2: SW 128th Street & Ambaum Boulevard SW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	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	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1803		1787	1881	1599	1770	3506		1770	3533	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1805	1803		1787	1881	1599	1770	3506		1770	3533	
Volume (vph)	25	30	16	160	40	320	11	702	47	210	760	10
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	26	31	16	165	41	330	11	724	48	216	784	10
RTOR Reduction (vph)	0	15	0	0	0	273	0	5	0	0	1	0
Lane Group Flow (vph)	26	32	0	165	41	57	11	767	0	216	793	0
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	2.0	5.5		10.4	13.9	13.9	1.5	32.9		15.2	46.6	
Effective Green, g (s)	2.0	5.5		10.4	13.9	13.9	1.5	32.9		15.2	46.6	
Actuated g/C Ratio	0.02	0.07		0.13	0.17	0.17	0.02	0.41		0.19	0.58	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	45	124		232	327	278	33	1442		336	2058	
v/s Ratio Prot	0.01	0.02		c0.09	0.02		0.01	c0.22		c0.12	0.22	
v/s Ratio Perm						c0.04						
v/c Ratio	0.58	0.26		0.71	0.13	0.21	0.33	0.53		0.64	0.39	
Uniform Delay, d1	38.6	35.3		33.4	27.9	28.3	38.8	17.7		29.9	9.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.22	0.39		1.00	1.00	
Incremental Delay, d2	16.7	1.1		9.8	0.2	0.4	5.7	1.4		4.2	0.5	
Delay (s)	55.3	36.4		43.2	28.1	28.7	53.1	8.4		34.1	9.5	
Level of Service	E	D		D	C	C	D	A		C	A	
Approach Delay (s)		43.1			33.1			9.0			14.8	
Approach LOS		D			C			A			B	

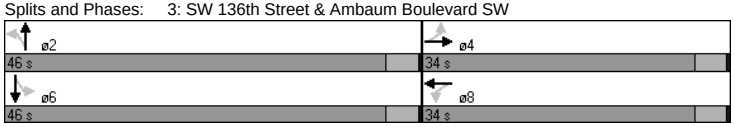
Intersection Summary			
HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	70	37	65	63	97	740	70	755
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	34.0	34.0	34.0	34.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	57.5%	57.5%	57.5%	57.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 1 (1%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 3: SW 136th Street & Ambaum Boulevard SW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		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	0.95		1.00	0.95	
Frt	1.00	0.90		1.00	0.92		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1684		1787	1738		1787	3537		1752	3454	
Flt Permitted	0.52	1.00		0.63	1.00		0.31	1.00		0.32	1.00	
Satd. Flow (perm)	962	1684		1183	1738		578	3537		596	3454	
Volume (vph)	70	37	66	65	63	65	97	740	55	70	755	81
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	75	40	71	70	68	70	104	796	59	75	812	87
RTOR Reduction (vph)	0	63	0	0	63	0	0	3	0	0	4	0
Lane Group Flow (vph)	75	48	0	70	75	0	104	852	0	75	895	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	3%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.5	8.5		8.5	8.5		63.5	63.5		63.5	63.5	
Effective Green, g (s)	8.5	8.5		8.5	8.5		63.5	63.5		63.5	63.5	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.79	0.79		0.79	0.79	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	102	179		126	185		459	2807		473	2742	
v/s Ratio Prot		0.03			0.04			0.24			c0.26	
v/s Ratio Perm	c0.08			0.06			0.18			0.13		
v/c Ratio	0.74	0.27		0.56	0.41		0.23	0.30		0.16	0.33	
Uniform Delay, d1	34.7	32.9		34.0	33.4		2.1	2.2		1.9	2.3	
Progression Factor	1.00	1.00		1.00	1.00		0.51	0.29		0.31	0.39	
Incremental Delay, d2	23.8	0.8		5.2	1.5		0.9	0.2		0.7	0.3	
Delay (s)	58.4	33.7		39.2	34.9		2.0	0.9		1.3	1.2	
Level of Service	E	C		D	C		A	A		A	A	
Approach Delay (s)		43.7			36.3			1.0			1.2	
Approach LOS		D			D			A			A	

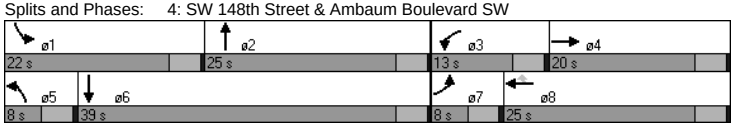
Intersection Summary			
HCM Average Control Delay	7.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	13	70	145	150	328	5	681	335	695
Turn Type	Prot		Prot		Perm	Prot		Prot	
Protected Phases	7	4	3	8		5	2	1	6
Permitted Phases					8				
Detector Phases	7	4	3	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	8.0	20.0	13.0	25.0	25.0	8.0	25.0	22.0	39.0
Total Split (%)	10.0%	25.0%	16.3%	31.3%	31.3%	10.0%	31.3%	27.5%	48.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 68 (85%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 4: SW 148th Street & Ambaum Boulevard SW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	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	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1811		1752	1845	1568	1787	3514		1752	3489	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1811		1752	1845	1568	1787	3514		1752	3489	
Volume (vph)	13	70	10	145	150	328	5	681	85	335	695	21
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	14	73	10	151	156	342	5	709	89	349	724	22
RTOR Reduction (vph)	0	7	0	0	0	265	0	11	0	0	2	0
Lane Group Flow (vph)	14	76	0	151	156	77	5	787	0	349	744	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	3%	3%	3%
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	0.8	9.9		8.9	18.0	18.0	1.3	24.0		21.2	43.9	
Effective Green, g (s)	0.8	9.9		8.9	18.0	18.0	1.3	24.0		21.2	43.9	
Actuated g/C Ratio	0.01	0.12		0.11	0.22	0.22	0.02	0.30		0.26	0.55	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	18	224		195	415	353	29	1054		464	1915	
v/s Ratio Prot	0.01	0.04		c0.09	c0.08		0.00	c0.22		c0.20	0.21	
v/s Ratio Perm						0.05						
v/c Ratio	0.78	0.34		0.77	0.38	0.22	0.17	0.75		0.75	0.39	
Uniform Delay, d1	39.5	32.1		34.6	26.2	25.3	38.8	25.3		27.0	10.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.11	0.71	
Incremental Delay, d2	107.6	0.9		17.3	0.6	0.3	2.8	4.8		6.6	0.6	
Delay (s)	147.1	33.0		51.8	26.8	25.6	41.6	30.1		36.5	7.9	
Level of Service	F	C		D	C	C	D	C		D	A	
Approach Delay (s)		49.4			32.0			30.2			17.0	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Appendix E

Southwest Suburban Sewer District – Certificate of Sewer Availability

Southwest Suburban Sewer District - Certificate of Sewer Availability

431 SW Ambaum Boulevard - Burien, WA 98166-2497 Phone 206-244-9575 E-mail: info@swssd.com

Date of application: **April 4, 2007** ☒ Certificate of Sewer Availability ☐ Certificate of Sewer Non-Availability

This certificate provides the information necessary to evaluate a development proposal

Building Permit☒ Short Plat☐ Lot Line Adjustment☐ Other:

Applicant's Name: **Westmark Emerald Pointe, LLC** Phone number, including Area Code: **206-624-6239**

Location of proposed Sanitary Sewer Service: **12th Avenue SW & SW 134th Street, Burien, WA 98146**

Parcel Number: **7835800280, 7835800252, 7835800310** Legal Description: **See attached legal descriptions**

Proposed Use: ☐ Single Family Residential Unit ☒ Multi Family Residential Units ☐ Commercial Units

1. a. ☐ The Southwest Suburban Sewer District has provided a side sewer stub connection to an existing ☐ 8" main **OR** main with a 6" sewer stub ☐ zero feet from the site. The Sanitary Sewer System has the capacity to serve the proposed use per the District and WA State Standards.

Or b. ☒ Sanitary Sewer Service will require an improvement to the sewer system of:
   ☐ (1) feet of sanitary sewer trunk line or lateral to reach the site; and/or
   ☐ (2) The construction of a collection system on the site; and/or
   ☒ (3) Other – describe: **Satisfactory Completion of a Developer's Extension**

2. *If 1.b above is checked, than Section 2.a or 2.b must be completed.*

   a. ☒ The proposed Sanitary Sewer System improvements are in conformance with a City approved Sanitary Sewer Comprehensive Plan.

Or b. ☐ The sewer system improvement will require a sewer comprehensive plan amendment.

3. a. ☒ The proposed project is within the corporate limits of the district, or has been granted Boundary Review Board (BRB) approval for extension of service outside the district or city.

Or b. ☐ Annexation or Boundary Review Board approval will be necessary prior to providing service.

4. A sanitary sewer easement encumbers this property. ☒ No ☐ Yes

5. This property is subject to Shoreline approval. ☐ No ☒ Yes

6. The Service is subject to the following:
   a. ☐ Easements are NOT required ☐ Easements MAY BE required ☒ Easements ARE required
   b. General Facility Charge for a Single Family Residential Unit at the rate of $2,705.00 .....
   c. General Facility Charge for Multi Family Residential Unit of $1,704.00 **X** the number of units **178 =** **$303,312.00**
   d. Side Sewer Permit Fee due prior to connection **$4,120.00**
   e. Local Facility charges due prior to connection: Pro-rata share of beach line upgrade..... **TBD**
   f. Other: **Close coordination with Southwest Suburban during design phaase.**

Total Amount Due .....

I hereby certify that the Southwest Suburban Sewer District information is True and Correct. This certification shall be valid for one year from the date the Certificate was signed by the District.

Southwest Suburban Sewer District Signed by: Julie Lee Baker 4-4-07
Date

Applicant's Signature _____

Date

Additional Terms And Conditions To This Certificate Are Found on The Reverse Side

ADDITIONAL TERMS AND CONDITIONS

1. This Certificate of Sewer Availability is valid only for the real property referenced herein for the sole purpose of submission to the appropriate building, engineering and/or health departments of other governmental agencies. This Certificate is between the District and the Applicant only, and cannot be assigned or transferred by any party. Further, no third party shall have any rights hereunder, whether by agency, as a third party beneficiary or otherwise.

2. The District makes no representations, express or implied, that the Applicant will be able to obtain the necessary permits, approvals, and authorizations from any governmental agency necessary before Applicant can utilize the utility service which is the subject of this Certificate.

3 The District reserves the right to change the rate or amount for District imposed service charges for connection to the sewer utility at any time before it receives the applicant's payment for such charges.

Additional Terms And Conditions To This Certificate Are Found on The Reverse Side

Appendix F

Seattle Public Utilities – Water Availability Inquiry Response Letter

Lindsay Diallo
705 2nd Avenue
Suite 710
Seattle, WA 98104

WATER AVAILABILITY INQUIRY

For Property: **12XX SW 136th Street** In: Burien Map No: 321-1

Requested for: Inquiry Rec'd by SPU: 03/08/2007

Developer:

Changes to the water distribution system:
ARE REQUIRED; New or upgraded water service should NOT be installed at this time. The following changes to the water distribution system are required before installation of services. This water Availability Inquiry is not valid for permits and does not guarantee issuance of Building or Land Use Permits for your proposed project. Please call Joe Phan at (206)684-5976.

Design and Installation of approximately 1390 feet of 12-inch diameter DIP water main in SW 136th Street extending from Ambaum Blvd SW the east boundary of 1410 SW 137th Street, then S along boundary to SW 137th Street, then W along 137th about 80 feet to connect to existing 6" main in SW 137th including 2 fire hydrants.

Approval Comments:
The existing 6" main under the project site shall be abandoned after construction of the new 12" main. The project shall be served by a master meter from the new 12" main at the end of the entry drive. An additional fire service may be installed from the existing 6" main in 12th Avenue SW if needed.

Inquiry Prepared by: K Y Certified by: Karen Younge Date: 03/20/2007

This Water Availability Inquiry ID No. **20070439** shall be valid for no more than 18 months from the date of certification. Changes after certification date may alter requirements.

Fireflow or other Seattle Fire Department requirements may alter water availability at any time. Water availability requirements will change if existing system cannot support desired water service.

EXISTING WATER SYSTEM INFORMATION

Water Service(s):
Size: 3/4" Type: Domestic Material: Galvanized Iron Meter: In

Pressure Zone: 585 Elevation: 262 Static Pressure: 140 psi
Recommended design pressure is 20 psi less than static pressure.

Proximity of nearest fire hydrant is: 1010 feet E of Property. Rate of flow at nearest hydrant is approximately: 984 gpm at 20psi for 2 or more hours, based on: Flow Simulation

Comment:
Estimate is based on tested hydrant at NW corner of 12th Av and 130th St. System capacity 2100 gpm @ 20 psi, residual flow 984 gpm @ 53 psi.

Water Main:
Size: 6 inches Material: Cast Iron Class: --- Year: 1964
- SubStandard

- Abutting

Water Main is available to serve in: 12th Avenue SW (existing service)
Distance of main to W margin of street is 5 feet.
Public ROW width is 30 feet.

The water system is in conformance with a County approved water comprehensive plan, and has water right claims sufficient to provide service.
The proposed project is within Seattle's water utility's direct service area.

Property: **12XX SW 136th Street** Inquiry ID No: 20070439

Water Service Requirements:

- New Meter Location: new 12" main to be installed in SW 136th Street
- The maximum allowable size for the fire services is the same size as the main; the largest available fire service is 8 inches. The maximum allowable size for irrigation, domestic, and combination services is one size smaller than the main; the largest available domestic or irrigation service size is 6 inches; and the largest available combination service is 10 inches.
- **One meter will serve the domestic water needs of a single legal parcel.** If the legal parcel is shortplatted prior to approval for occupancy after final inspection of the building permit, then separate meters will be required for each legally described parcel. This may necessitate the installation of a water main by the developer.
- The property owner is responsible for the installation, maintenance and liability of the service line from the City union near the meter to the building served. New water service piping from the City union to the building must be inspected by SPU prior to covering. Call (206) 684-5800 for an inspection.
- For new water services, Property owner must sign SPU's Application and Agreement for Water Service, pay all connection service charges, and other charges which may or may not be listed below, and submit the legal description of the property to be served. Apply for service at 700 5th Avenue, 31st floor. The time between the service order and installation varies depending on workload, service size and type. **Wait Times can be 30-90 days;** call (206) 684-5800 for the current projected wait time.
- A PRV (pressure-reducing valve) on private property is required. The Uniform Plumbing Code requires a PRV when water pressure is 80 psi or greater for domestic water service only.

Required Payments:

- A calculated Connection Charge may apply when any new water service is ordered.
- When required by the Fire Department, or when requested by the developer, standard charges for hydraulic modeling or a hydrant flow test are due.
- Standard charges are due when any new water service is ordered, or when any existing water service is retired or re-established.
- For questions regarding standard charges or other fees for water service, please contact Seattle Public Utilities at 206-684-5800.

General Comments:

- One domestic water meter is allowed to serve one legal parcel. A subdivision must be approved with address(es) assigned prior to ordering additional water service(s).
- Plans provided at this time do not indicate change to existing water service(s). Please provide detailed plans of water services at time of ordering new meter(s). Please realize that water requirements may change when desired water service is requested.
- If the proposed project changes after this review of Water Availability, or if the current plan submitted to SPU does not detail the entire scope of the proposed project, water requirements may change and a new Water Availability Certificate will need to be issued to supersede the Water Availability Certificate which is based on incomplete or modified data.
- Customers connected to sewers in the King County (KC) service area are subject to the KC capacity charge. Call King County (206) 296-1450 for more information.