

Attachment D
Vissim Model Delay

Metro SW Corridor DEIS- Segment A - PM model
Existing Conditions Vissim Model Methodology and
Results Memorandum

Delay Results for PM**Peak Hour****(4:30-5:30 PM)****Existing Conditions Delay (Sec)**

Study Intersection No.		2	3	4	6	8
Approach	Movement	Naito/Hawthorne	Naito/Jefferson	Naito/Columbia	Naito/Clay	Naito/Market
NB	Left		41		64	
	Thru		0	27	31	238
	Right	252				349
SB	Left					7
	Thru		16	4	8	2
	Right		14		5	
EB	Left			47		74
	Thru			64		56
	Right					71
WB	Left				35	
	Thru				35	
	Right				180	
Intersection Total		252	10	22	39	60

Delay Results for PM Peak Hour (4:30-5:30 PM) Existing Conditions Delay (Sec)							
Study Intersection No.		12	13	19	20	21	22
Approach	Movement	1st/Harrison	Naito/Harrison	6th/Hall St	5th/Hall	4th/Hall	Broadway/College
NB	Left	27	143	14		12	
	Thru		18	11		7	
	Right	23	22				
SB	Left	55			41		9
	Thru	45	24		51		8
	Right	36	30				7
EB	Left		71	8		15	
	Thru	30	12		18		0
	Right	51	33	8	14		16
WB	Left	24	54		23		27
	Thru	18	31	8	21		23
	Right		18	10			
Intersection Total		38	36	10	40	9	11

Delay Results for PM**Peak Hour****(4:30-5:30 PM)****Existing Conditions Delay (Sec)**

Study Intersection No.		23	24	25	26	27
Approach	Movement	6th/College	5th/College	4th/College	Broadway/Jackson	6th/Jackson
NB	Left	11		4		9
	Thru	9		4		1
	Right					
SB	Left		9		4	
	Thru		11		6	
	Right				0	
EB	Left	22		13		13
	Thru		30		11	
	Right	16	22		18	
WB	Left		24		29	
	Thru	10	21		27	
	Right	13				0
Intersection Total		10	15	4	11	4

Delay Results for PM**Peak Hour****(4:30-5:30 PM)****Existing Conditions Delay (Sec)**

Study Intersection No.		28	29	30	31	33	34
Approach	Movement	6th/I-405 On-Ramp	5th/Jackson	5th/Lincoln	4th/Lincoln	2nd/Lincoln	1st/Lincoln
NB	Left	10			16	15	28
	Thru				13		21
	Right					5	
SB	Left		11	3		11	
	Thru		13	0			16
	Right		69			5	21
EB	Left				39	17	23
	Thru		41			10	15
	Right		46		13	16	
WB	Left			0		25	
	Thru				17	12	
	Right				12	11	
Intersection Total		10	14	4	13	13	19

Delay Results for PM**Peak Hour****(4:30-5:30 PM)****Existing Conditions Delay (Sec)**

Study Intersection No.		35	36	37	38
Approach	Movement	Naito/Lincoln	4th/Grant	Broadway/I-405 SB Off-Ramp	Broadway/6th
NB	Left				
	Thru	23			253
	Right			45	
SB	Left			35	
	Thru	7		28	
	Right			27	
EB	Left				106
	Thru			38	15
	Right			47	25
WB	Left				
	Thru				
	Right				24
Intersection Total		11	#DIV/0!	42	57

Delay Results for PM Peak Hour (4:30-5:30 PM) Existing Conditions Delay (Sec)					
Study Intersection No.		39	40	41	42
Approach	Movement	Broadway/5th	4th/Caruthers	5th/Caruthers	4th/Caruthers/Broadway
NB	Left		155		86
	Thru		104		8
	Right				
SB	Left				
	Thru	44	9	19	
	Right		11	13	
EB	Left		249		
	Thru	8	159		
	Right				
WB	Left		16	30	
	Thru	150	63	32	17
	Right		70		4
Intersection Total		72	62	19	22

Delay Results for PM Peak Hour (4:30-5:30 PM) Existing Conditions Delay (Sec)					
Study Intersection No.		43	44	45	46
Approach	Movement	5th/Sheridan	6th/Terwillige/Sheridan	4th/Barbur/Sheridan St	1st/Sheridan
NB	Left		207		1
	Thru		193	52	0
	Right		186	71	1
SB	Left	20	51		12
	Thru		2		2
	Right		1		2
EB	Left		0	32	10
	Thru		0	1	8
	Right	38	0	26	14
WB	Left				13
	Thru				30
	Right				7
Intersection Total		22	114	27	5

Delay Results for PM**Peak Hour****(4:30-5:30 PM)****Existing Conditions Delay (Sec)**

Study Intersection No.		47	48	52	56
Approach	Movement	Naito/Sheridan	1st/Arthur	Barbur/Hooker	Kelly/Corbett/Porter/Hood
NB	Left		108	24	
	Thru		68	8	86
	Right		71	9	93
SB	Left		72	21	32
	Thru		26	15	9
	Right		19	21	10
EB	Left		143	9	
	Thru		176	15	6
	Right	3	220	12	
WB	Left			13	
	Thru	3	183	13	
	Right		203	9	
Intersection Total		3	166	11	82

Delay Results for PM**Peak Hour****(4:30-5:30 PM)****Existing Conditions Delay (Sec)**

Study Intersection No.		58	59	61
Approach	Movement	Barbur/Woods	Water/Ross Island Bridge	Naito/Ross Island Bridge
NB	Left	6		
	Thru	5		
	Right	4		121
SB	Left	12		
	Thru	7		
	Right	4	11	
EB	Left	13		
	Thru	9		
	Right	0		221
WB	Left	17		
	Thru	0	54	
	Right	7	61	
Intersection Total		6	52	191

Delay Results for PM**Peak Hour****(4:30-5:30 PM)****Existing Conditions Delay (Sec)**

Study Intersection No.		62	69	70	77	78
Approach	Movement	Kelly/Ross Island Bridge	Naito/Gibbs	Kelly/Gibbs	Barbur/Lane	Barbur/Abernathy
NB	Left			0	8	21
	Thru		115	32	0	
	Right	62	205	0		
SB	Left			112		
	Thru			120	75	4
	Right			115	65	1
EB	Left			80	71	29
	Thru			34	72	43
	Right			0		
WB	Left					
	Thru					
	Right		221			
Intersection Total		62	146	49	35	5

Delay Results for PM**Peak Hour****(4:30-5:30 PM)****Existing Conditions Delay (Sec)**

Study Intersection No.		80	81	82	83
Approach	Movement	Barbur/Bancroft	Corbett/Bancroft	Barbur/Hamilton	Hamilton/Corbett
NB	Left		2		147
	Thru		1	64	148
	Right	17	1	98	150
SB	Left		3	172	15
	Thru		0	36	18
	Right		0	24	17
EB	Left		21	521	32
	Thru		22	655	27
	Right		23	679	36
WB	Left		12	85	23
	Thru		11	92	18
	Right	12	8	41	11
Intersection Total		16	7	75	72

Attachment E
Vissim Model Queue Data

Metro SW Corridor DEIS- Segment A - PM model
Existing Conditions Vissim Model Methodology and
Results Memorandum

**Queuing Results for
PM Peak Hour
(4:30-5:30 PM)**

Existing Conditions 95th Percentile Queues (ft)

Study Intersection No.		2	3	4	6	8
Approach	Movement	Naito/Hawthorne	Naito/Jefferson	Naito/Columbia	Naito/Clay	Naito/Market
NB	Left	-	181	298	171	376
	Thru	-	-	349	339	771
	Right	614	-	-	-	-
SB	Left	-	-	-	268	289
	Thru	-	759	299	303	290
	Right	-	-	-	-	-
EB	Left	-	-	-	-	783
	Thru	-	-	535	-	1063
	Right	-	-	-	-	1060
WB	Left	-	-	-	-	-
	Thru	-	-	-	812	-
	Right	-	-	-	847	-

*Queue Calculation uses methodology consistent with the WSDOT Vissim Protocol, using a percentile function and the model data

**Queuing Results for
PM Peak Hour
(4:30-5:30 PM)**

Existing Conditions 95th Percentile Queues (ft)

Study Intersection No.		12	13	19	20	21	22
Approach	Movement	1st/Harrison	Naito/Harrison	6th/Hall St	5th/Hall	4th/Hall	Broadway/College
NB	Left	193	587	-	-	-	-
	Thru	-	409	262	-	303	-
	Right	697	-	-	-	-	-
SB	Left	-	-	-	-	-	-
	Thru	-	764	-	850	-	1022
	Right	-	-	-	-	-	-
EB	Left	-	1934	-	-	-	-
	Thru	549	402	95	92	154	44
	Right	-	527	-	-	-	-
WB	Left	-	315	-	-	-	-
	Thru	282	193	194	271	-	300
	Right	-	-	-	-	-	-

*Queue Calculation uses methodology consistent with the WSDOT Vissim Protocol, using a percentile function and the model data

Queuing Results for PM Peak Hour (4:30-5:30 PM) Existing Conditions 95th Percentile Queues (ft)						
Study Intersection No.		23	24	25	26	27
Approach	Movement	6th/College	5th/College	4th/College	Broadway/Jackson	6th/Jackson
NB	Left	-	-	-	-	-
	Thru	262	-	476	-	1076
	Right	-	-	-	-	-
SB	Left	-	-	-	-	-
	Thru	-	272	-	277	-
	Right	-	-	-	-	-
EB	Left	-	-	-	-	286
	Thru	148	70	-	209	-
	Right	-	-	132	-	-
WB	Left	-	-	-	-	-
	Thru	220	289	-	1300	-
	Right	-	-	-	-	21

*Queue Calculation uses methodology consistent with the WSDOT Vissim Protocol, using a percentile function and the model data

**Queuing Results for
PM Peak Hour
(4:30-5:30 PM)**

Existing Conditions 95th Percentile Queues (ft)

Study Intersection No.		28	29	30	31	33	34
Approach	Movement	6th/I-405 On-Ramp	5th/Jackson	5th/Lincoln	4th/Lincoln	2nd/Lincoln	1st/Lincoln
NB	Left	716	-	-	-	-	743
	Thru	-	-	-	509	58	808
	Right	-	-	-	237	-	-
SB	Left	-	-	-	-	-	-
	Thru	-	279	236	-	61	432
	Right	-	-	-	-	-	-
EB	Left	-	-	-	23	52	63
	Thru	-	-	-	274	276	-
	Right	-	49	-	-	-	284
WB	Left	-	-	-	-	130	-
	Thru	-	-	-	330	305	-
	Right	-	-	47	-	-	-

*Queue Calculation uses methodology consistent with the WSDOT Vissim Protocol, using a percentile function and the model data

**Queuing Results for
PM Peak Hour
(4:30-5:30 PM)**

Existing Conditions 95th Percentile Queues (ft)

Study Intersection No.		35	36	37	38
Approach	Movement	Naito/Lincoln	4th/Grant	Broadway/I-405 SB Off-Ramp	Broadway/6th
NB	Left	-	-	-	-
	Thru	807	-	-	459
	Right	-	-	403	-
SB	Left	-	-	-	-
	Thru	535	-	511	-
	Right	-	-	-	-
EB	Left	-	0	-	477
	Thru	-	-	1155	487
	Right	-	-	-	-
WB	Left	-	-	-	-
	Thru	-	-	-	-
	Right	-	-	-	231

*Queue Calculation uses methodology consistent with the WSDOT Vissim Protocol, using a percentile function and the model data

**Queuing Results for
PM Peak Hour
(4:30-5:30 PM)**

Existing Conditions 95th Percentile Queues (ft)

Study Intersection No.		39	40	41	42
Approach	Movement	Broadway/5th	4th/Caruthers	5th/Caruthers	4th/Caruthers/Broadway
NB	Left	-	-	-	297
	Thru	-	309	-	266
	Right	-	-	-	-
SB	Left	-	-	-	-
	Thru	-	458	428	-
	Right	738	-	-	-
EB	Left	-	139	-	-
	Thru	241	-	-	-
	Right	-	-	-	-
WB	Left	-	-	-	-
	Thru	-	271	173	1445
	Right	649	-	-	-

*Queue Calculation uses methodology consistent with the WSDOT Vissim Protocol, using a percentile function and the model data

Queuing Results for PM Peak Hour (4:30-5:30 PM) Existing Conditions 95th Percentile Queues (ft)					
Study Intersection No.		43	44	45	46
Approach	Movement	5th/Sheridan	6th/Terwillige/Sheridan	4th/Barbur/Sheridan St	1st/Sheridan
NB	Left	-	-	432	-
	Thru	-	1261	660	-
	Right	-	-	-	-
SB	Left	320	271	-	771
	Thru	-	286	-	-
	Right	-	-	-	-
EB	Left	-	-	-	-
	Thru	288	0	322	79
	Right	-	-	297	-
WB	Left	-	-	-	-
	Thru	-	-	-	68
	Right	-	-	-	-

*Queue Calculation uses methodology consistent with the WSDOT Vissim Protocol, using a percentile function and the model data

**Queuing Results for
PM Peak Hour
(4:30-5:30 PM)**

Existing Conditions 95th Percentile Queues (ft)

Study Intersection No.		47	48	52	56
Approach	Movement	Naito/Sheridan	1st/Arthur	Barbur/Hooker	Kelly/Corbett/Porter/Hood
NB	Left	-	294	60	-
	Thru	-	376	292	-
	Right	-	-	-	-
SB	Left	-	489	351	140
	Thru	-	540	1044	-
	Right	-	132	-	-
EB	Left	-	1323	-	-
	Thru	-	1320	37	-
	Right	-	-	-	22
WB	Left	-	-	-	-
	Thru	-	8409	84	-
	Right	-	-	-	-

*Queue Calculation uses methodology consistent with the WSDOT Vissim Protocol, using a percentile function and the model data

**Queuing Results for
PM Peak Hour
(4:30-5:30 PM)**

Existing Conditions 95th Percentile Queues (ft)

Study Intersection No.		58	59	61
Approach	Movement	Barbur/Woods	Water/Ross Island Bridge	Naito/Ross Island Bridge
NB	Left	0	-	-
	Thru	-	-	-
	Right	-	-	-
SB	Left	194	-	4028
	Thru	-	-	-
	Right	-	79	-
EB	Left	-	-	-
	Thru	20	-	-
	Right	-	-	-
WB	Left	-	-	-
	Thru	86	-	-
	Right	-	-	-

*Queue Calculation uses methodology consistent with the WSDOT Vissim Protocol, using a percentile function and the model data

**Queuing Results for
PM Peak Hour
(4:30-5:30 PM)**

Existing Conditions 95th Percentile Queues (ft)

Study Intersection No.		62	69	70	77	78
Approach	Movement	Kelly/Ross Island Bridge	Naito/Gibbs	Kelly/Gibbs	Barbur/Lane	Barbur/Abernathy
NB	Left	-	-	-	87	106
	Thru	-	-	1527	185	-
	Right	500	-	-	-	-
SB	Left	-	-	-	2511	-
	Thru	-	-	59	-	-
	Right	-	-	-	-	-
EB	Left	-	-	-	245	-
	Thru	3734	-	-	-	187
	Right	-	-	2561	-	-
WB	Left	-	-	-	-	-
	Thru	-	-	-	-	-
	Right	-	2311	-	-	-

*Queue Calculation uses methodology consistent with the WSDOT Vissim Protocol, using a percentile function and the model data

Queuing Results for PM Peak Hour (4:30-5:30 PM) Existing Conditions 95th Percentile Queues (ft)					
Study Intersection No.		80	81	82	83
Approach	Movement	Barbur/Bancroft	Corbett/Bancroft	Barbur/Hamilton	Hamilton/Corbett
NB	Left	-	-	-	-
	Thru	-	176	1690	1636
	Right	-	-	-	-
SB	Left	-	-	4426	-
	Thru	-	192	4421	295
	Right	-	-	-	-
EB	Left	-	-	-	-
	Thru	-	952	997	711
	Right	-	-	-	-
WB	Left	-	-	-	-
	Thru	-	64	505	84
	Right	89	-	496	-

*Queue Calculation uses methodology consistent with the WSDOT Vissim Protocol, using a percentile function and the model data

Existing Conditions 95th Percentile Queues (ft) - PM Peak Hour (4:30 - 5:30 PM)					
Intersection #	Movement	Average Queue (ft)	Std Dev (ft)	Max Queue (ft)	95th Percentile Queue (ft)
2	SW Naito Pkwy On-Ramp @ Hawthorne Bridge:NBR	535	35	614	577
3	SW Naito Pkwy @ SW Jefferson St:NBL	59	35	181	118
3	SW Naito Pkwy @ SW Jefferson St:SBT	295	123	759	486
4	SW Naito Pkwy @ SW Columbia St:NBL	26	44	298	68
4	SW Naito Pkwy @ SW Columbia St:NBT	281	46	349	312
4	SW Naito Pkwy @ SW Columbia St:SBT	109	94	299	274
4	SW Naito Pkwy @ SW Columbia St:EBT	198	86	535	358
6	SW Naito Pkwy @ SW Clay St:NBL	28	26	171	71
6	SW Naito Pkwy @ SW Clay St:NBT	243	45	339	288
6	SW Naito Pkwy @ SW Clay St:SBL	40	57	268	157
6	SW Naito Pkwy @ SW Clay St:SBT	179	61	303	265
6	SW Naito Pkwy @ SW Clay St:WBT	399	243	812	789
6	SW Naito Pkwy @ SW Clay St:WBR	456	262	847	826
8	SW Naito Pkwy @ SW Market St:NBL	100	139	376	359
8	SW Naito Pkwy @ SW Market St:NBT	428	219	771	741
8	SW Naito Pkwy @ SW Market St:SBL	121	73	289	266
8	SW Naito Pkwy @ SW Market St:SBT	23	28	290	63
8	SW Naito Pkwy @ SW Market St:EBL	143	144	783	562
8	SW Naito Pkwy @ SW Market St:EBT	312	230	1063	787
8	SW Naito Pkwy @ SW Market St:EBR	95	116	1060	159
12	SW 1st Ave @ SW Harrison St:NBL	49	37	193	133
12	SW 1st Ave @ SW Harrison St:NBR	48	100	697	106
12	SW 1st Ave @ SW Harrison St:EBT	107	79	549	251
12	SW 1st Ave @ SW Harrison St:WBT	83	39	282	156
13	SW Naito Pkwy @ SW Harrison St:NBL	249	156	587	565
13	SW Naito Pkwy @ SW Harrison St:NBT	62	65	409	212
13	SW Naito Pkwy @ SW Harrison St:SBT	316	148	764	512
13	SW Naito Pkwy @ SW Harrison St:EBL	129	222	1934	316
13	SW Naito Pkwy @ SW Harrison St:EBT	73	54	402	172
13	SW Naito Pkwy @ SW Harrison St:EBR	85	57	527	181
13	SW Naito Pkwy @ SW Harrison St:WBL	92	45	315	167
13	SW Naito Pkwy @ SW Harrison St:WBT	46	35	193	118
19	SW 6th Ave @ SW Hall St:NBT	94	38	262	157
19	SW 6th Ave @ SW Hall St:EBT	30	20	95	69
19	SW 6th Ave @ SW Hall St:WBT	33	33	194	91
20	SW 5th Ave @ SW Hall St:SBT	187	162	850	561
20	SW 5th Ave @ SW Hall St:EBT	28	21	92	68
20	SW 5th Ave @ SW Hall St:WBT	71	46	271	157
21	SW 4th Ave @ SW Hall St:NBT	121	66	303	271
21	SW 4th Ave @ SW Hall St:EBT	30	23	154	70
22	SW Broadway @ SW College St:SBT	126	125	1022	214
22	SW Broadway @ SW College St:EBT	4	9	44	21
22	SW Broadway @ SW College St:WBT	67	56	300	181
23	SW 6th Ave @ SW College St:NBT	75	31	262	124
23	SW 6th Ave @ SW College St:EBT	32	26	148	86
23	SW 6th Ave @ SW College St:WBT	51	41	220	134
24	SW 5th Ave @ SW College St:SBT	132	62	272	208
24	SW 5th Ave @ SW College St:EBT	21	17	70	47
24	SW 5th Ave @ SW College St:WBT	96	59	289	202
25	SW 4th Ave @ SW College St:NBT	99	58	476	192
25	SW 4th Ave @ SW College St:EBR	24	18	132	60
26	SW Broadway @ SW Jackson St:SBT	123	59	277	272
26	SW Broadway @ SW Jackson St:EBT	34	28	209	67
26	SW Broadway @ SW Jackson St:WBT	136	155	1300	325
27	SW 6th Ave @ SW Jackson St:NBT	29	111	1076	110
27	SW 6th Ave @ SW Jackson St:EBL	30	28	286	65
27	SW 6th Ave @ SW Jackson St:WBR	0	3	21	0
28	SW 6th Ave @ I-405/Hwy 26 On-Ramp:NBL	466	121	716	679
29	SW 5th Ave @ SW Jackson St:SBT	167	68	279	269
29	SW 5th Ave @ SW Jackson St:EBR	7	11	49	23

Existing Conditions 95th Percentile Queues (ft) - PM Peak Hour (4:30 - 5:30 PM)

Intersection #	Movement	Average Queue (ft)	Std Dev (ft)	Max Queue (ft)	95th Percentile Queue (ft)
30	SW 5th Ave @ SW Lincoln St:SBT	11	29	236	53
30	SW 5th Ave @ SW Lincoln St:WBR	5	10	47	23
31	SW 4th Ave @ SW Lincoln St:NBT	166	104	509	310
31	SW 4th Ave @ SW Lincoln St:NBR	40	35	237	108
31	SW 4th Ave @ SW Lincoln St:EBL	1	5	23	18
31	SW 4th Ave @ SW Lincoln St:EBT	51	41	274	117
31	SW 4th Ave @ SW Lincoln St:WBT	57	48	330	157
33	SW 2nd Ave @ SW Lincoln St:NBT	9	11	58	20
33	SW 2nd Ave @ SW Lincoln St:SBT	6	10	61	21
33	SW 2nd Ave @ SW Lincoln St:EBL	3	8	52	22
33	SW 2nd Ave @ SW Lincoln St:EBT	74	52	276	177
33	SW 2nd Ave @ SW Lincoln St:WBL	11	16	130	43
33	SW 2nd Ave @ SW Lincoln St:WBT	67	54	305	165
34	SW 1st Ave @ SW Lincoln St:NBL	55	58	743	113
34	SW 1st Ave @ SW Lincoln St:NBT	57	65	808	111
34	SW 1st Ave @ SW Lincoln St:SBT	137	62	432	245
34	SW 1st Ave @ SW Lincoln St:EBL	13	14	63	44
34	SW 1st Ave @ SW Lincoln St:EBR	66	44	284	149
35	SW Naito Pkwy @ SW Lincoln St:NBT	85	113	807	301
35	SW Naito Pkwy @ SW Lincoln St:SBT	159	139	535	440
36	SW 4th Ave @ SW Grant St:EBL	0	0	0	0
37	SW Broadway @ I-405 SB Off-Ramp/SW Lincoln St:NBR	163	132	403	358
37	SW Broadway @ I-405 SB Off-Ramp/SW Lincoln St:SBT	161	131	511	493
37	SW Broadway @ I-405 SB Off-Ramp/SW Lincoln St:EBT	341	261	1155	1056
38	SW Broadway @ SW Grant St/SW 6th Ave:NBT	396	50	459	441
38	SW Broadway @ SW Grant St/SW 6th Ave:EBL	217	131	477	440
38	SW Broadway @ SW Grant St/SW 6th Ave:EBT	254	124	487	449
38	SW Broadway @ SW Grant St/SW 6th Ave:WBR	170	27	231	199
39	SW Broadway @ SW 5th Ave:SBR	178	114	738	414
39	SW Broadway @ SW 5th Ave:EBT	94	79	241	240
39	SW Broadway @ SW 5th Ave:WBR	596	14	649	623
40	SW 4th Ave @ SW Caruthers St:NBT	184	76	309	272
40	SW 4th Ave @ SW Caruthers St:SBT	146	105	458	338
40	SW 4th Ave @ SW Caruthers St:EBL	39	42	139	137
40	SW 4th Ave @ SW Caruthers St:WBT	36	35	271	93
41	SW 5th Ave @ SW Caruthers St:SBT	231	118	428	413
41	SW 5th Ave @ SW Caruthers St:WBT	12	22	173	57
42	SW 4th Ave @ SW Caruthers St/SW Broadway:NBL	111	69	297	260
42	SW 4th Ave @ SW Caruthers St/SW Broadway:NBT	115	59	266	209
42	SW 4th Ave @ SW Caruthers St/SW Broadway:WBT	1231	283	1445	1422
43	SW 5th Ave @ SW Sheridan St:SBL	211	77	320	297
43	SW 5th Ave @ SW Sheridan St:EBT	87	57	288	246
44	SW 6th Ave/SW Terwilliger Blvd @ SW Sheridan St:NBT	986	411	1261	1247
44	SW 6th Ave/SW Terwilliger Blvd @ SW Sheridan St:SBL	40	39	271	90
44	SW 6th Ave/SW Terwilliger Blvd @ SW Sheridan St:SBT	41	44	286	118
44	SW 6th Ave/SW Terwilliger Blvd @ SW Sheridan St:EBT	0	0	0	0
45	SW 4th Ave/SW Barbur Blvd @ SW Sheridan St:NBL	113	75	432	284
45	SW 4th Ave/SW Barbur Blvd @ SW Sheridan St:NBT	215	91	660	361
45	SW 4th Ave/SW Barbur Blvd @ SW Sheridan St:EBT	203	81	322	268
45	SW 4th Ave/SW Barbur Blvd @ SW Sheridan St:EBR	9	35	297	43
46	SW 1st Ave @ SW Sheridan St:SBL	88	94	771	247
46	SW 1st Ave @ SW Sheridan St:EBT	9	12	79	21
46	SW 1st Ave @ SW Sheridan St:WBT	20	12	68	43
48	SW 1st Ave @ SW Arthur St:NBL	24	26	294	67
48	SW 1st Ave @ SW Arthur St:NBT	108	64	376	222
48	SW 1st Ave @ SW Arthur St:SBL	122	77	489	279
48	SW 1st Ave @ SW Arthur St:SBT	131	83	540	290
48	SW 1st Ave @ SW Arthur St:SBR	20	24	132	65
48	SW 1st Ave @ SW Arthur St:EBL	931	498	1323	1293
48	SW 1st Ave @ SW Arthur St:EBT	1106	289	1320	1304

Existing Conditions 95th Percentile Queues (ft) - PM Peak Hour (4:30 - 5:30 PM)					
Intersection #	Movement	Average Queue (ft)	Std Dev (ft)	Max Queue (ft)	95th Percentile Queue (ft)
48	SW 1st Ave @ SW Arthur St:WBT	2131	1915	8409	5860
51	SW Water St @ SW Kelly St:SBT	164	135	413	357
51	SW Water St @ SW Kelly St:EBL	2	9	78	0
52	SW Barbur Blvd @ SW Hooker St:NBL	1	6	60	21
52	SW Barbur Blvd @ SW Hooker St:NBT	105	62	292	222
52	SW Barbur Blvd @ SW Hooker St:SBL	13	25	351	47
52	SW Barbur Blvd @ SW Hooker St:SBT	234	210	1044	579
52	SW Barbur Blvd @ SW Hooker St:EBT	2	6	37	18
52	SW Barbur Blvd @ SW Hooker St:WBT	24	13	84	45
56	SW Kelly St/SW Corbett Ave @ SW Porter St/SW Hood Ave	20	27	140	73
56	SW Kelly St/SW Corbett Ave @ SW Porter St/SW Hood Ave	5	9	22	20
58	SW Barbur Blvd @ SW Woods St:NBL	0	0	0	0
58	SW Barbur Blvd @ SW Woods St:SBL	24	33	194	93
58	SW Barbur Blvd @ SW Woods St:EBT	3	7	20	19
58	SW Barbur Blvd @ SW Woods St:WBT	12	11	86	22
59	SW Water Ave @ Ross Island Bridge:SBR	18	13	79	42
61	SW Naito Pkwy @ Ross Island Bridge:SBL	1663	557	4028	2732
62	Kelly Ramps @ Ross Island Bridge:NBR	447	13	500	478
62	Kelly Ramps @ Ross Island Bridge:EBT	2510	190	3734	2892
69	SW Naito Pkwy @ SW Gibbs St/Naito Ramps:WBR	1529	449	2311	1983
70	SW Kelly Ave @ SW Gibbs St:NBT	1122	173	1527	1380
70	SW Kelly Ave @ SW Gibbs St:SBT	1	4	59	0
70	SW Kelly Ave @ SW Gibbs St:EBR	448	844	2561	2236
71	SW Barbur Blvd @ SW Whitaker St:SBL	0	3	32	0
71	SW Barbur Blvd @ SW Whitaker St:WBT	17	16	89	42
73	SW Kelly Ave @ SW Whitaker St:WBT	559	1189	8604	2707
75	SW Barbur Blvd @ SW Pennoyer St:SBL	0	2	38	0
75	SW Barbur Blvd @ SW Pennoyer St:WBT	11	14	46	43
76	SW Barbur Blvd @ SW Condor Ave:NBL	0	0	0	0
76	SW Barbur Blvd @ SW Condor Ave:EBT	39	26	217	83
77	SW Barbur Blvd @ SW Lane St:NBL	2	10	87	28
77	SW Barbur Blvd @ SW Lane St:NBT	7	22	185	53
77	SW Barbur Blvd @ SW Lane St:SBL	454	749	2511	2299
77	SW Barbur Blvd @ SW Lane St:EBL	107	76	245	207
78	SW Barbur Blvd @ SW Abernathy St:NBL	1	7	106	0
78	SW Barbur Blvd @ SW Abernathy St:EBT	12	17	187	33
79	SW Barbur Blvd @ SW Lowell St:WBR	3	7	21	19
80	SW Barbur Blvd @ SW Bancroft St:WBR	24	16	89	60
81	SW Corbett Ave @ SW Bancroft St:NBT	12	23	176	69
81	SW Corbett Ave @ SW Bancroft St:SBT	6	21	192	37
81	SW Corbett Ave @ SW Bancroft St:EBT	292	242	952	877
81	SW Corbett Ave @ SW Bancroft St:WBT	17	12	64	41
82	SW Barbur Blvd @ SW Hamilton St:NBT	652	226	1690	1034
82	SW Barbur Blvd @ SW Hamilton St:SBL	1576	1268	4426	4214
82	SW Barbur Blvd @ SW Hamilton St:SBT	1516	1312	4421	4209
82	SW Barbur Blvd @ SW Hamilton St:EBT	485	298	997	958
82	SW Barbur Blvd @ SW Hamilton St:WBT	328	118	505	484
82	SW Barbur Blvd @ SW Hamilton St:WBR	38	65	496	104
83	SW Hamilton Blvd @ SW Corbett Ave:NBT	1044	464	1636	1580
83	SW Hamilton Blvd @ SW Corbett Ave:SBT	73	41	295	153
83	SW Hamilton Blvd @ SW Corbett Ave:EBT	440	191	711	648
83	SW Hamilton Blvd @ SW Corbett Ave:WBT	24	14	84	53
85	SW Barbur Blvd @ SW Capitol Hwy EB:NBT	0	0	0	0
85	SW Barbur Blvd @ SW Capitol Hwy EB:WBR	0	0	0	0
87	SW Terwilliger Blvd @ SW Capitol Hwy:NBT	102	54	278	200
87	SW Terwilliger Blvd @ SW Capitol Hwy:SBT	332	121	778	559
87	SW Terwilliger Blvd @ SW Capitol Hwy:EBL	66	39	214	137
87	SW Terwilliger Blvd @ SW Capitol Hwy:EBT	525	304	1875	1120
87	SW Terwilliger Blvd @ SW Capitol Hwy:EBR	146	299	1867	784
87	SW Terwilliger Blvd @ SW Capitol Hwy:WBL	13	17	84	46

Existing Conditions 95th Percentile Queues (ft) - PM Peak Hour (4:30 - 5:30 PM)					
Intersection #	Movement	Average Queue (ft)	Std Dev (ft)	Max Queue (ft)	95th Percentile Queue (ft)
87	SW Terwilliger Blvd @ SW Capitol Hwy:WBT	277	114	735	482

Attachment F
Vissim Model Travel Time Data

Metro SW Corridor DEIS- Segment A - PM model
Existing Conditions Vissim Model Methodology and
Results Memorandum

An aerial photograph of a highway interchange. A red line traces a travel route starting from a point on the left, moving south, then east, and finally following a bridge over a river. The route is labeled with orange text. Two white boxes with black text and arrows indicate the start and end points of the route. The background shows a mix of urban development, greenery, and a large body of water.

Start: Middle of I-405 SB Off-Ramp/Broadway Intersection

OR 26 Eastbound (Vissim Travel Time Route #1)
I-405 Off-Ramp to Hwy 99E

End: Ross Island Bridge
Eastbound above Hwy 99E



End: I-405 NB On-Ramp
under Broadway

OR 26 Westbound (Vissim Travel Time Route #2)
Milwaukie Ave to I-405 NB On-Ramp

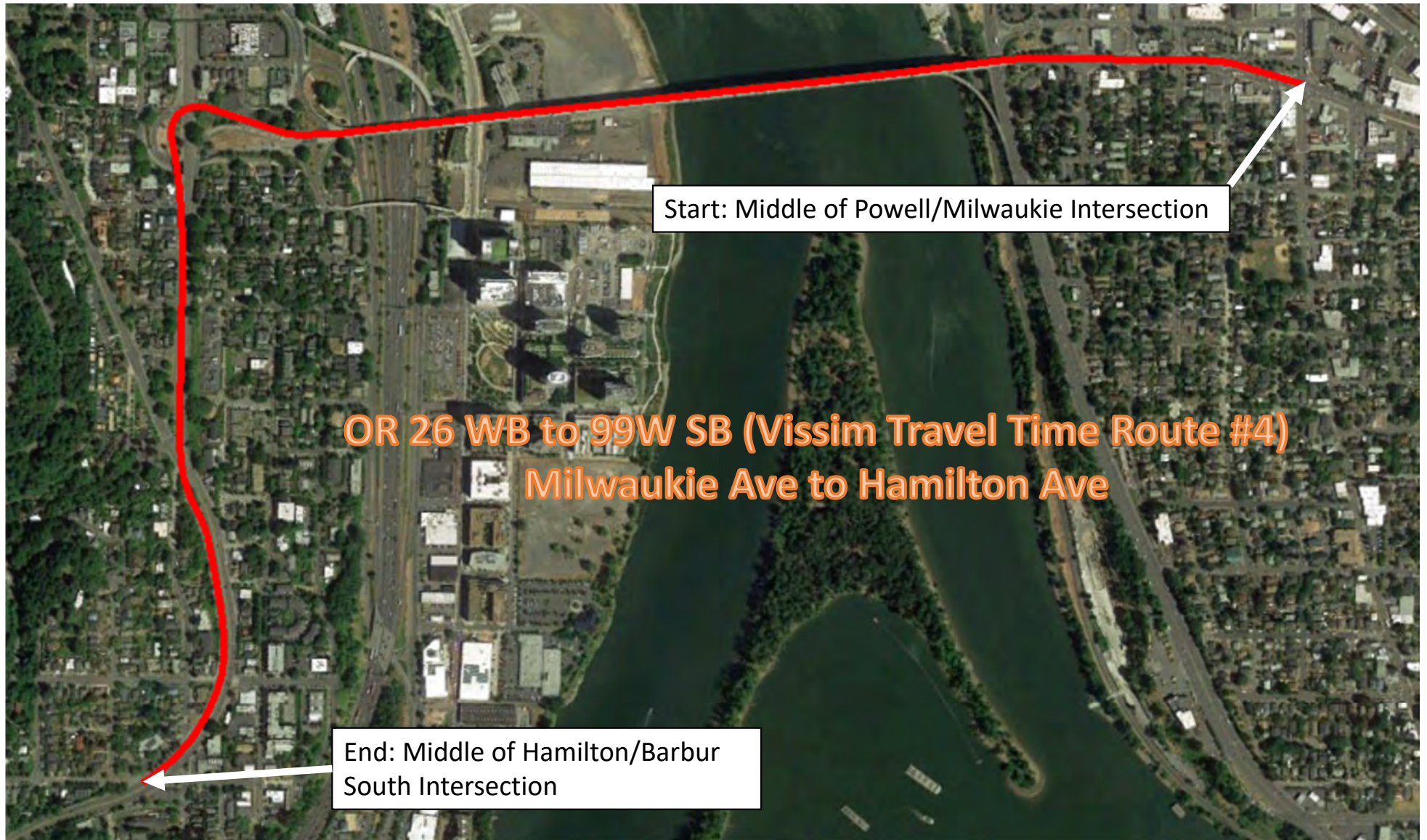
Start: Middle of Powell/Milwaukie Intersection



End: Ross Island Bridge Eastbound above Hwy 99E

99W NB to OR 26 EB (Vissim Travel Time Route #3)
Hamilton Ave to Hwy 99E

Start: Middle of Hamilton/Barbur
South Intersection



Start: Middle of Powell/Milwaukie Intersection

OR 26 WB to 99W SB (Vissim Travel Time Route #4)
Milwaukie Ave to Hamilton Ave

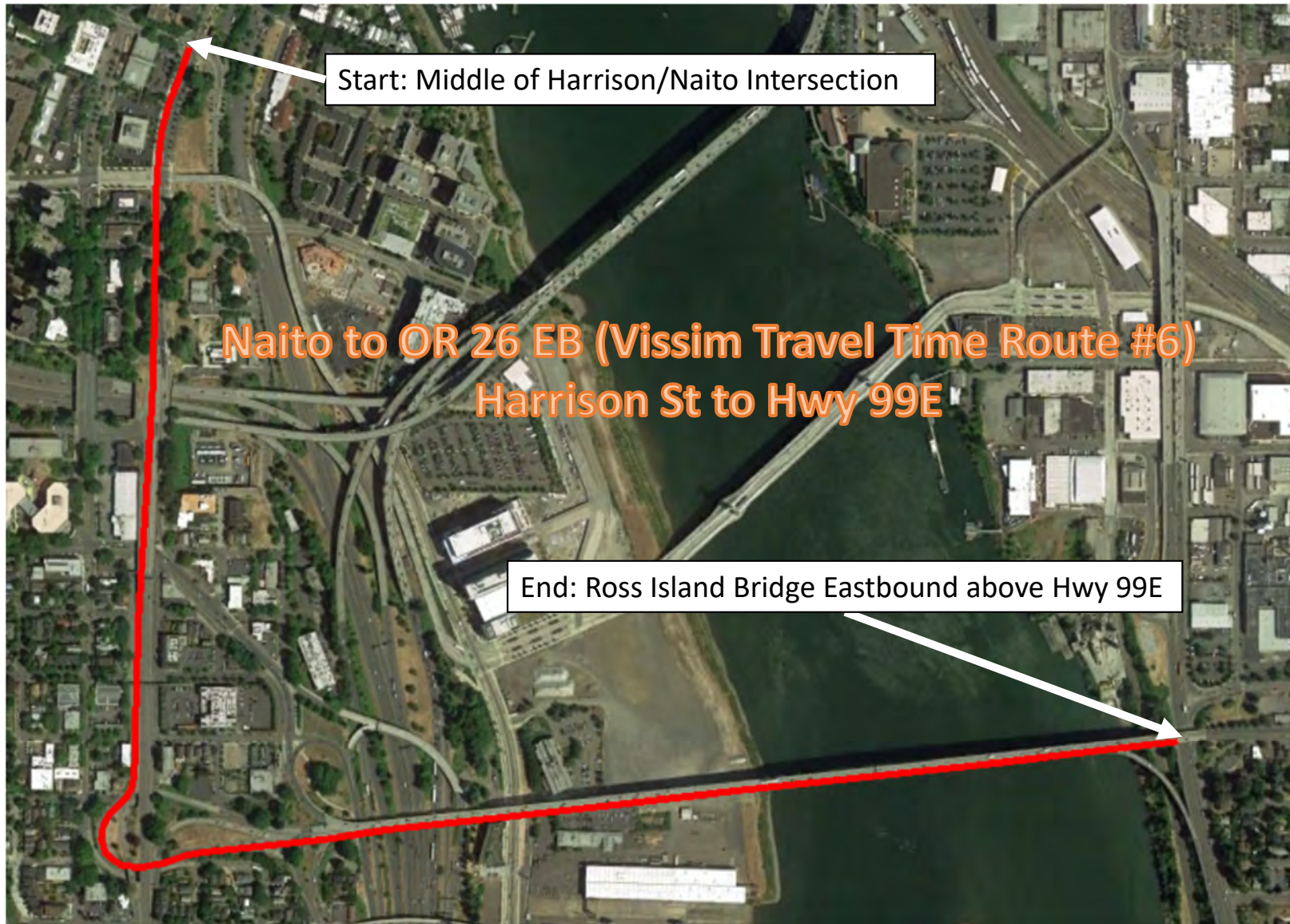
End: Middle of Hamilton/Barbur
South Intersection

An aerial photograph of a coastal area. A red dashed line traces a route starting from the intersection of Macadam and Curry streets, heading north on Curry St, then turning east onto I-5, and finally crossing the Ross Island Bridge. A red solid line also follows a similar path but includes a loop around a residential area to the west of the bridge. Two white arrows point to the start and end points of the route.

End: Ross Island Bridge Eastbound above Hwy 99E

I-5 NB to OR 26 EB (Vissim Travel Time Route #5)
Curry St to Hwy 99E

Start: Middle of Macadam/Curry Intersection



Start: Middle of Harrison/Naito Intersection

Naito to OR 26 EB (Vissim Travel Time Route #6)
Harrison St to Hwy 99E

End: Ross Island Bridge Eastbound above Hwy 99E

Existing PM Peak (4:30-5:30 PM)				Travel Time (Sec)				Model Average Speed (mph)	Model 85th Percentile (mph)	Model Average Delay (min)
From	To	Distance (ft)	Vehicles	10-Run Average	Standard Deviation	Min	Max			
I-405 SB Exit Ramp @ Broadway	Hwy 99E on Powell Blvd	8812	200	15:24	2:32	7:36	22:28	7	8	11:54
Powell Blvd/Milwaukie Ave	I-405 NB Entrance Ramp @ SW 6th	9677	246	15:01	4:20	6:15	31:41	7	11	11:36
Barbur Blvd/Hamilton Street	Hwy 99E on Powell Blvd	8020	597	9:19	1:39	6:02	16:48	10	13	6:35
Powell Blvd/Milwaukie Ave	Barbur Blvd/Hamilton Street	9972	593	4:14	1:09	2:44	9:51	27	36	1:06
Macadam Ave/Curry St	Hwy 99E on Powell Blvd	7216	233	10:08	2:42	5:15	21:09	8	11	7:29
Naito Pkwy/Harrison St	Hwy 99E on Powell Blvd	8029	14	8:41	1:14	5:55	12:34	11	14	5:56

Vissim Travel Times (averaged over 15 simulations)									
Travel Time Segment	4:00 PM	4:15 PM	4:30 PM	4:45 PM	5:00 PM	5:15 PM	5:30 PM	5:45 PM	4:30-5:30 PM
I-405 to Ross Island Bridge EB	13:18	16:06	16:20	15:44	14:24	14:49	14:09	10:36	14:32
Ross Island Bridge to I-405 WB	6:35	8:25	11:28	14:35	16:36	16:38	15:01	11:26	12:39
Hamilton to Ross Island Bridge	9:55	8:42	8:29	8:22	9:21	10:55	12:45	13:35	10:22
Ross Island Bridge to Hamilton	3:44	4:02	4:00	3:44	4:45	4:29	4:56	3:38	4:10
Macadam to Ross Island Bridge	12:57	12:49	11:47	10:19	9:23	8:47	9:08	8:17	10:36
Natio to Ross Island Bridge EB	10:24	9:15	8:23	8:17	9:00	9:19	8:05	7:13	8:48

Vissim Travel Time Data by Simulation Run

Vissim Travel Time (4:30-5:30 PM)

	<i>Simulation Run #</i>															Standard Deviation
Travel Time Segment	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1: I-405 to Ross Island Bridge EB	14:13	14:48	15:54	12:11	15:47	14:05	17:15	15:36	17:14	14:33	12:36	17:02	15:00	16:46	17:54	1:42
2: Ross Island Bridge to I-405 WB	18:06	14:51	14:01	9:46	10:24	16:30	11:16	15:16	17:51	16:17	15:41	17:05	18:51	18:49	11:41	3:03
3: Hamilton to Ross Island Bridge	9:30	10:13	10:41	8:54	9:11	9:41	9:18	9:07	8:18	8:25	9:51	9:43	8:34	9:02	9:31	0:39
4: Ross Island Bridge to Hamilton	5:03	3:46	3:54	3:35	3:34	4:53	3:45	3:47	4:41	4:15	3:47	4:19	5:24	4:56	3:43	0:37
5: Macadam to Ross Island Bridge	12:49	9:44	8:02	8:19	9:50	10:13	10:16	14:37	8:18	8:44	8:54	10:08	10:30	10:40	10:03	1:45
6: Natio to Ross Island Bridge EB	9:25	8:28	9:42	8:13	8:57	9:05	8:29	7:53	7:59	8:58	9:08	8:00	7:50	8:35	9:03	0:35

Vissim Throughput (4:30-5:30 PM)

	<i>Simulation Run #</i>															Standard Deviation
Travel Time Segment	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1: I-405 to Ross Island Bridge EB	124	127	137	137	156	118	134	144	125	124	144	122	131	137	141	10
2: Ross Island Bridge to I-405 WB	168	170	162	169	189	161	173	154	175	147	162	156	146	172	158	11
3: Hamilton to Ross Island Bridge	402	396	383	436	384	396	395	372	417	397	404	405	394	397	396	15
4: Ross Island Bridge to Hamilton	393	381	431	386	365	356	427	378	393	412	405	438	401	399	370	24
5: Macadam to Ross Island Bridge	175	147	159	160	170	157	167	163	147	126	147	150	155	145	161	12
6: Natio to Ross Island Bridge EB	12	9	7	9	11	10	4	6	11	10	12	12	9	5	11	3

HERE Data travel times

Tuesday

	4:00 PM	4:15 PM	4:30 PM	4:45 PM	5:00 PM	5:15 PM	5:30 PM	5:45 PM	4:30-5:30 PM
I-405 to Ross Island Bridge EB	5:55	6:17	6:13	8:24	13:01	14:47	10:22	8:11	10:36
Ross Island Bridge to I-405 WB	10:03	10:10	9:26	8:37	8:34	11:29	13:04	8:44	9:31
Hamilton to Ross Island Bridge	4:45	5:11	5:15	5:05	4:56	5:04	4:33	4:35	5:05
Ross Island Bridge to Hamilton	3:52	3:43	3:38	4:23	5:23	4:41	4:17	4:09	4:31
Macadam to Ross Island Bridge	6:16	5:28	4:46	5:39	6:55	6:47	6:08	5:43	6:02
Natio to Ross Island Bridge EB	4:32	4:29	4:53	5:46	5:48	5:36	4:26	4:23	5:31

Wednesday

	4:00 PM	4:15 PM	4:30 PM	4:45 PM	5:00 PM	5:15 PM	5:30 PM	5:45 PM	4:30-5:30 PM
I-405 to Ross Island Bridge EB	7:38	10:38	10:17	10:41	9:37	8:10	9:51	9:04	9:41
Ross Island Bridge to I-405 WB	9:43	7:31	7:05	9:52	9:13	8:58	9:20	8:26	8:47
Hamilton to Ross Island Bridge	4:32	5:25	4:13	4:59	5:37	5:39	8:45	8:25	5:07
Ross Island Bridge to Hamilton	3:53	3:47	3:45	4:08	4:22	4:10	4:17	4:28	4:06
Macadam to Ross Island Bridge	4:40	6:07	6:11	7:28	6:51	6:26	8:29	7:47	6:44
Natio to Ross Island Bridge EB	4:04	4:38	5:43	7:51	7:59	5:41	6:11	6:31	6:49

Thursday

	4:00 PM	4:15 PM	4:30 PM	4:45 PM	5:00 PM	5:15 PM	5:30 PM	5:45 PM	4:30-5:30 PM
I-405 to Ross Island Bridge EB	6:44	7:49	8:44	8:41	9:37	14:52	15:28	14:47	10:29
Ross Island Bridge to I-405 WB	6:48	6:40	7:35	7:01	8:26	7:18	6:38	6:13	7:35
Hamilton to Ross Island Bridge	4:04	4:29	4:56	5:04	6:31	10:06	9:47	6:03	6:39
Ross Island Bridge to Hamilton	3:21	3:41	4:11	4:14	4:05	4:01	3:21	3:13	4:08
Macadam to Ross Island Bridge	4:33	4:33	5:58	6:16	5:52	6:02	6:22	6:43	6:02
Natio to Ross Island Bridge EB	4:10	4:47	4:59	5:53	5:53	5:54	5:11	4:43	5:40

Google Travel Times

Segment	From	To	Maximum Travel Time (min) - 3/14/2017 to 3/16/2018	
			AM Peak (7:00-9:00 AM)	PM Peak (4:00 -6:00 PM)
I-5 Northbound	99W On-ramp	4th/Lincoln via I-405 and Exit 1B	15	15
I-5 Southbound	5th/Lincoln	99W Off-ramp (Exit 294) via I-405	15	15
Barbur Northbound	60th	4th/Lincoln	15	15
Barbur Southbound	5th/Lincoln	60th	15	15
I-405 - Ross Island Bridge	I-405 Southbound Exit Ramp at Broadway	Powell Blvd / Milwaukie Ave	8	22
Ross Island Bridge - I-405	Powell Blvd / Milwaukie Ave	I-405 Northbound Entrance Ramp at SW 6th I-405 Southbound	10	16
Barbur South - Ross Island Bridge	Barbur Boulevard / Hamilton Street	Powell Blvd / Milwaukie Ave	6	17
Ross Island Bridge - Barbur South	Powell Blvd / Milwaukie Ave	Barbur Boulevard / Hamilton Street	5	7
I-5 Northbound - Ross Island Bridge	Macadam Avenue / Curry Street	Powell Blvd / Milwaukie Ave	6	17
Downtown to Ross Island Bridge	Naito Pkwy / Harrison St	Powell Blvd / Milwaukie Ave	6	12