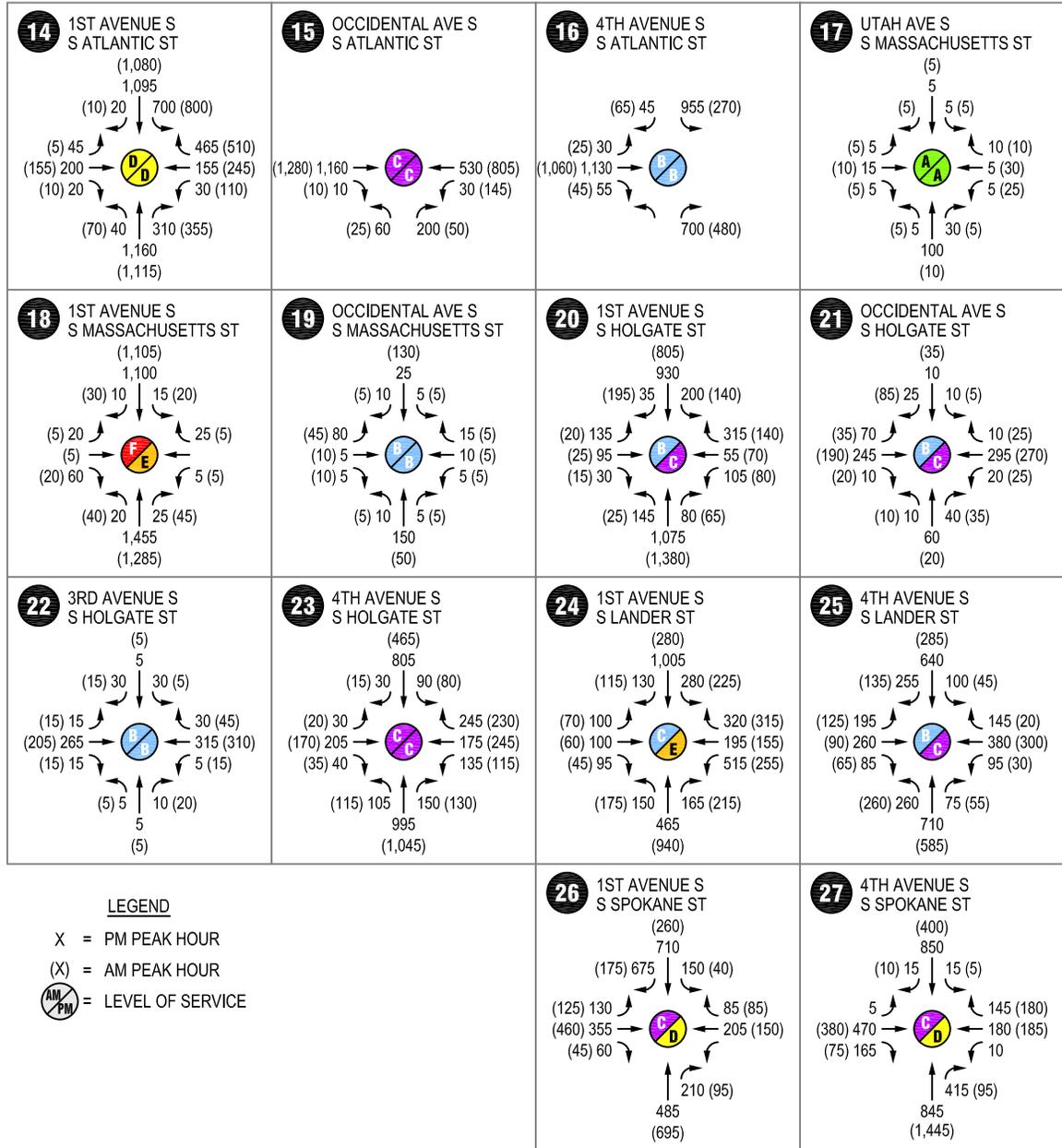
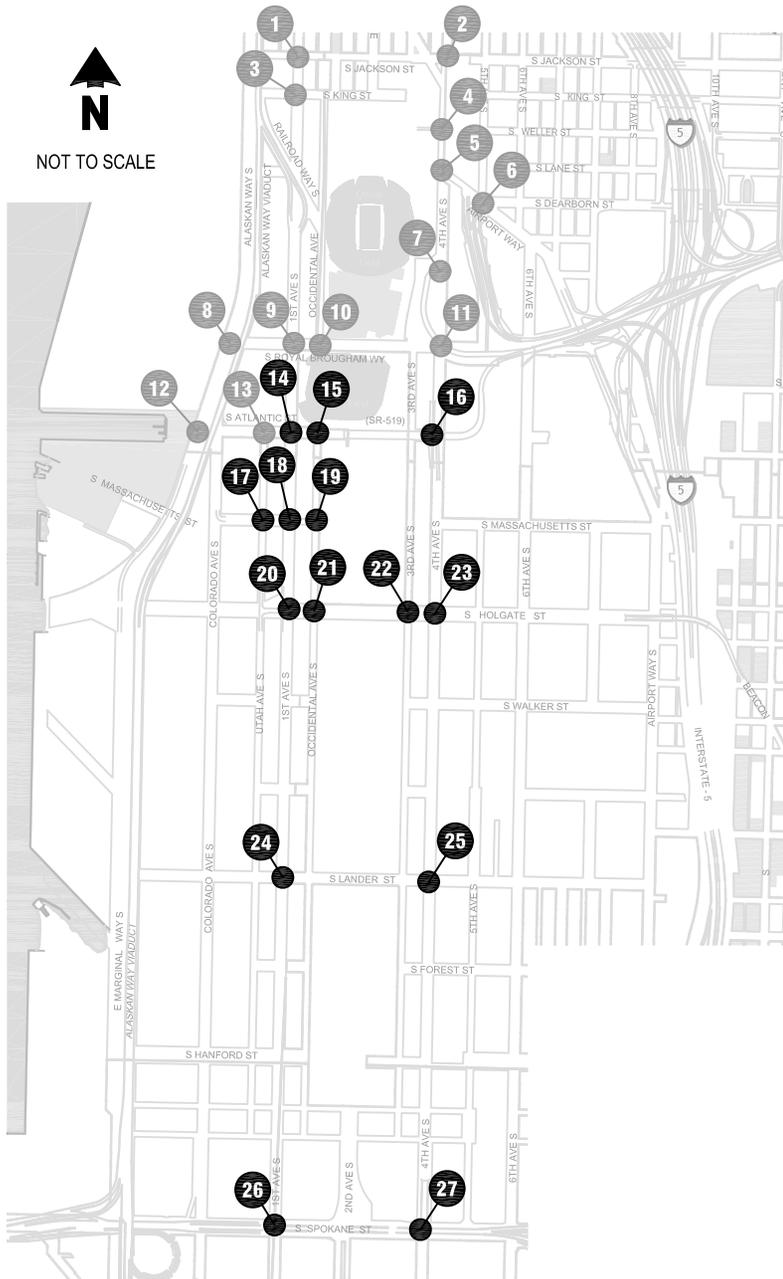


Appendix A-10c

2011 Proposed Action Peak Hour Traffic Volumes and Intersection Levels of Service (North)

SR 519 Intermodal Access Project, Phase 2



LEGEND

X = PM PEAK HOUR

(X) = AM PEAK HOUR

(C/D/E/F) = LEVEL OF SERVICE

Appendix A-10d

2011 Proposed Action Peak Hour Traffic Volumes and Intersection Levels of Service (South)

SR 519 Intermodal Access Project, Phase 2



APPENDIX A-11A. 2030 AM PEAK HOUR INTERSECTION LOS SUMMARY (NO BUILD & PROPOSED ACTION)

Study Intersection		No Build			Proposed Action		
		LOS ¹	Delay ²	V/C ³ or WM ⁴	LOS	Delay	V/C or WM
	S Jackson St/1 st Ave S	C	26.6	0.99	C	26.6	0.97
	S Jackson St/4 th Ave S	C	27.4	0.86	C	29.4	0.86
	S King St/1 st Ave S	B	18.8	0.74	B	15.0	0.66
	S Weller St/4 th Ave S	E	77.8	0.84	E	70.9	0.83
	Airport Way S/4 th Ave S	F	166.1	1.37	F	174.0	1.36
	I-90 Off Ramp/4 th Ave S	D	42.1	0.93	C	27.1	0.65
	Alaskan Way/S Royal Brougham Way	E	57.2	0.83	E	57.2	0.83
	1 st Ave S/S Royal Brougham Way	E	64.8	0.78	D	46.8	0.78
	Occidental Ave S/S Royal Brougham Way	C	22.0	0.38	C	23.6	0.45
	4 th Ave S/S Royal Brougham Way	D	36.9	0.81	D	42.9	0.80
	Alaskan Way/S Atlantic St	D	47.6	0.90	D	47.6	0.90
	Utah Ave S/S Atlantic St	F	599.7	SB	F	229.3	SB
	1 st Ave S/S Atlantic St	F	312.8	3.16	F	94.4	1.14
	Occidental Ave S/S Atlantic St	F	481.3	NB	C	19.4	NBR
	4 th Ave S/S Atlantic St	C	27.5	0.93	B	11.8	0.64
	Utah Ave S/S Massachusetts St	A	7.5	- ⁵	A	7.5	- ⁵
	1 st Ave S/S Massachusetts St	F	- ⁶	EB/WB	F	- ⁶	EB/WB
	Occidental Ave S/S Massachusetts St	B	11.8	WB	B	11.8	WB
	1 st Ave S/S Holgate St	B	13.7	0.71	B	15.8	0.77
	Occidental Ave S/S Holgate St	B	10.6	NB/SB	B	10.6	NB/SB
	3 rd Ave S/S Holgate St	B	10.9	NB	B	10.9	NB
	4 th Ave S/S Holgate St	C	21.2	0.70	C	21.4	0.63
	1 st Ave S/S Lander St	D	37.1	0.86	D	41.9	0.93
	4 th Ave S/S Lander St	B	19.6	0.56	C	25.2	0.70
	1 st Ave S/S Spokane St	F	98.4	1.15	F	98.3	1.15
	4 th Ave S/S Spokane St	F	282.7	1.62	F	282.4	1.62
	5 th Ave S/Airport Way S	D	50.0	0.77	D	50.0	0.77
	Colorado Ave S/S Atlantic St	C	30.8	0.79	C	30.8	0.79
	SR 519 Ramp/S Atlantic St	-	-	-	B	10.8	0.52

1. Level of service, based on 2000 Highway Capacity Manual methodology.

2. Average delay in seconds per vehicle.

3. Volume-to-capacity ratio reported for signalized intersections.

4. Worst movement reported for two-way stop-controlled intersections.

5. Volume-to-capacity ratio not reported for all-way stop-controlled intersections.

EXHIBIT A-11B. 2030 PM PEAK HOUR INTERSECTION LOS SUMMARY (NO BUILD & PROPOSED ACTION)

Study Intersection		No Build			Proposed Action		
		LOS ¹	Delay ²	V/C ³ or WM ⁴	LOS	Delay	V/C or WM
	S Jackson St/1 st Ave S	B	19.8	0.96	B	18.2	0.87
	S Jackson St/4 th Ave S	C	27.7	0.83	C	27.9	0.83
	S King St/1 st Ave S	E	56.7	1.15	C	21.9	0.89
	S Weller St/4 th Ave S	B	16.1	0.52	B	16.1	0.52
	Airport Way S/4 th Ave S	D	51.4	0.83	D	49.2	0.83
	I-90 Off Ramp/4 th Ave S	D	42.1	0.80	D	38.4	0.65
	Alaskan Way/S Royal Brougham Way	D	50.9	0.95	D	50.9	0.95
	1 st Ave S/S Royal Brougham Way	F	93.3	1.17	E	73.7	1.06
	Occidental Ave/S Royal Brougham Way	C	21.7	0.45	C	22.3	0.50
	4 th Ave S/S Royal Brougham Way	F	116.8	1.20	F	99.6	1.17
	Alaskan Way/S Atlantic St	D	35.5	0.62	D	38.9	0.68
	Utah Ave S/S Atlantic St	F	- ⁶	NB/SB	F	651.2	SB
	1 st Ave S/S Atlantic St	F	172.9	1.78	D	53.3	0.87
	Occidental Ave S/S Atlantic St	F	- ⁶	NB	E	36.2	NBR
	4 th Ave S/S Atlantic St	B	18.5	0.89	B	18.7	0.94
	Utah Ave S/S Massachusetts St	A	7.9	- ⁵	A	7.9	- ⁵
	1 st Ave S/S Massachusetts St	F	274.3	EB	F	539.7	WB
	Occidental Ave S/S Massachusetts St	B	13.0	EB	B	13.0	EB
	1 st Ave S/S Holgate St	B	17.0	0.71	B	18.6	0.76
	Occidental Ave S/S Holgate St	B	11.5	NB	B	11.5	NB
	3 rd Ave S/S Holgate St	B	12.2	SB	B	12.2	SB
	4 th Ave S/S Holgate St	C	22.2	0.70	C	23.2	0.70
	1 st Ave S/S Lander St	F	83.3	1.18	F	82.8	1.18
	4 th Ave S/S Lander St	D	53.6	0.93	E	67.0	0.98
	1 st Ave S/S Spokane St	C	31.1	0.48	C	31.1	0.48
	4 th Ave S/S Spokane St	F	110.5	1.00	F	110.3	1.00
	5 th Ave S/Airport Way S	D	36.2	0.60	D	36.2	0.60
	Colorado Ave S/S Atlantic St	C	33.9	0.69	D	50.6	0.69
	SR 519 Ramp/S Atlantic St	-	-	-	A	7.5	0.56

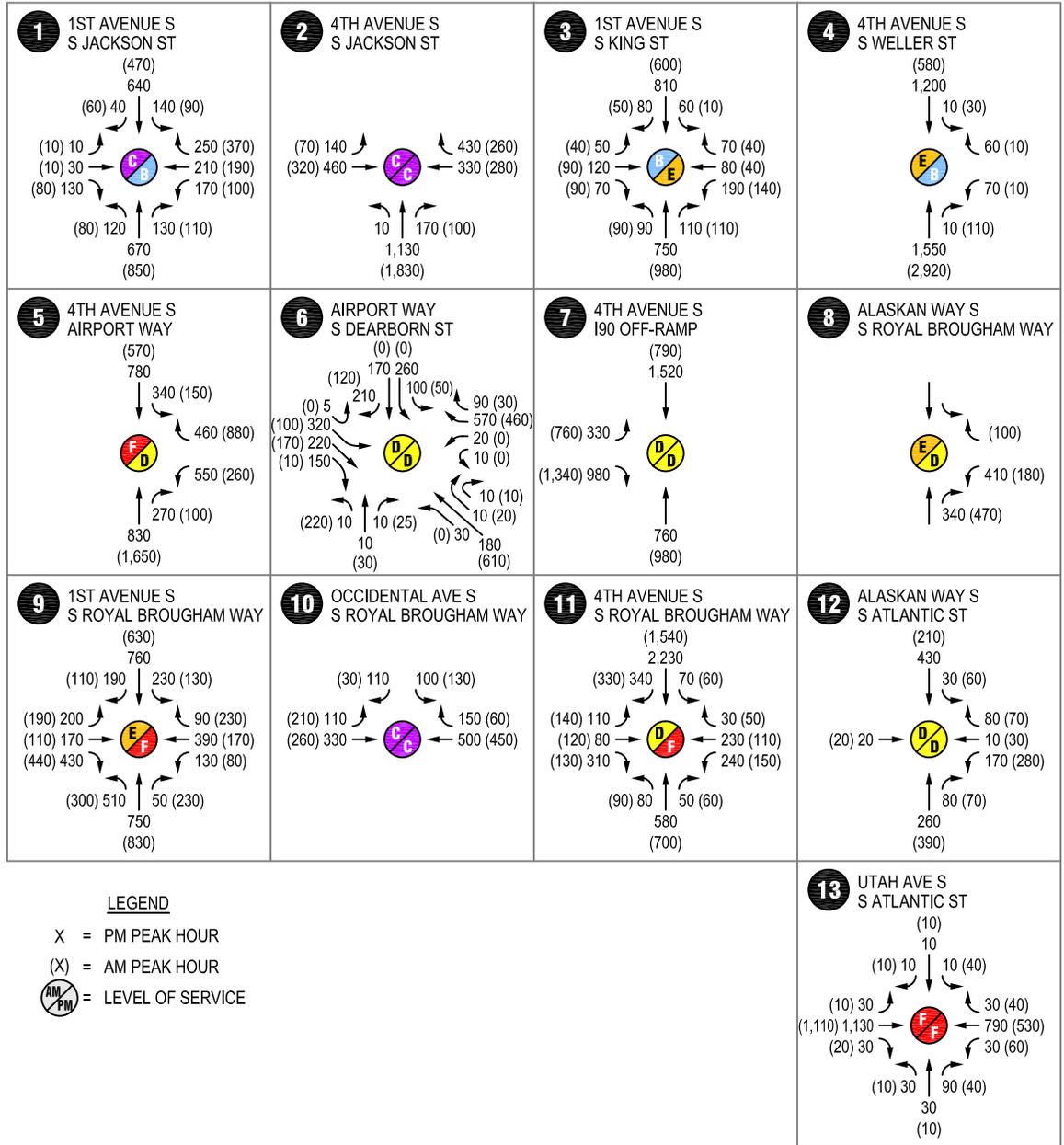
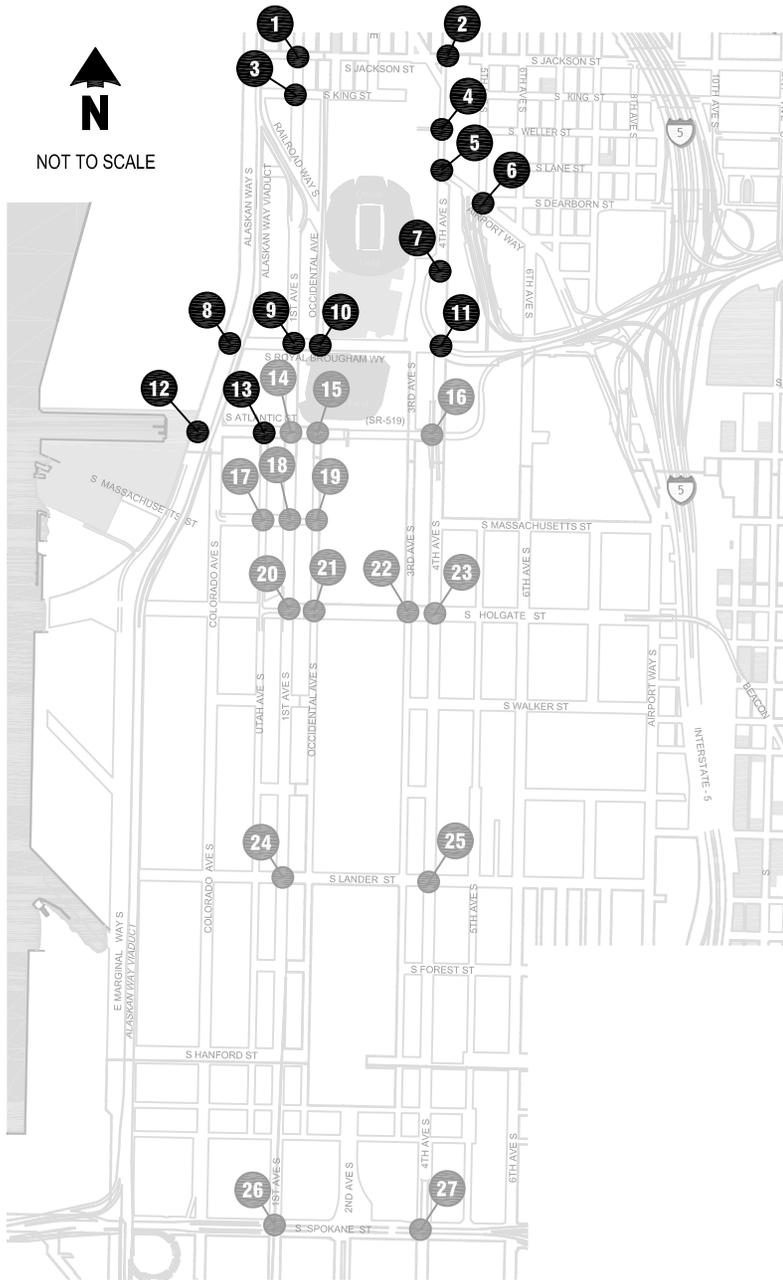
1. Level of service, based on 2000 Highway Capacity Manual methodology.

2. Average delay in seconds per vehicle.

3. Volume-to-capacity ratio reported for signalized intersections.

4. Worst movement reported for two-way stop-controlled intersections.

5. Volume-to-capacity ratio not reported for all-way stop-controlled intersections.

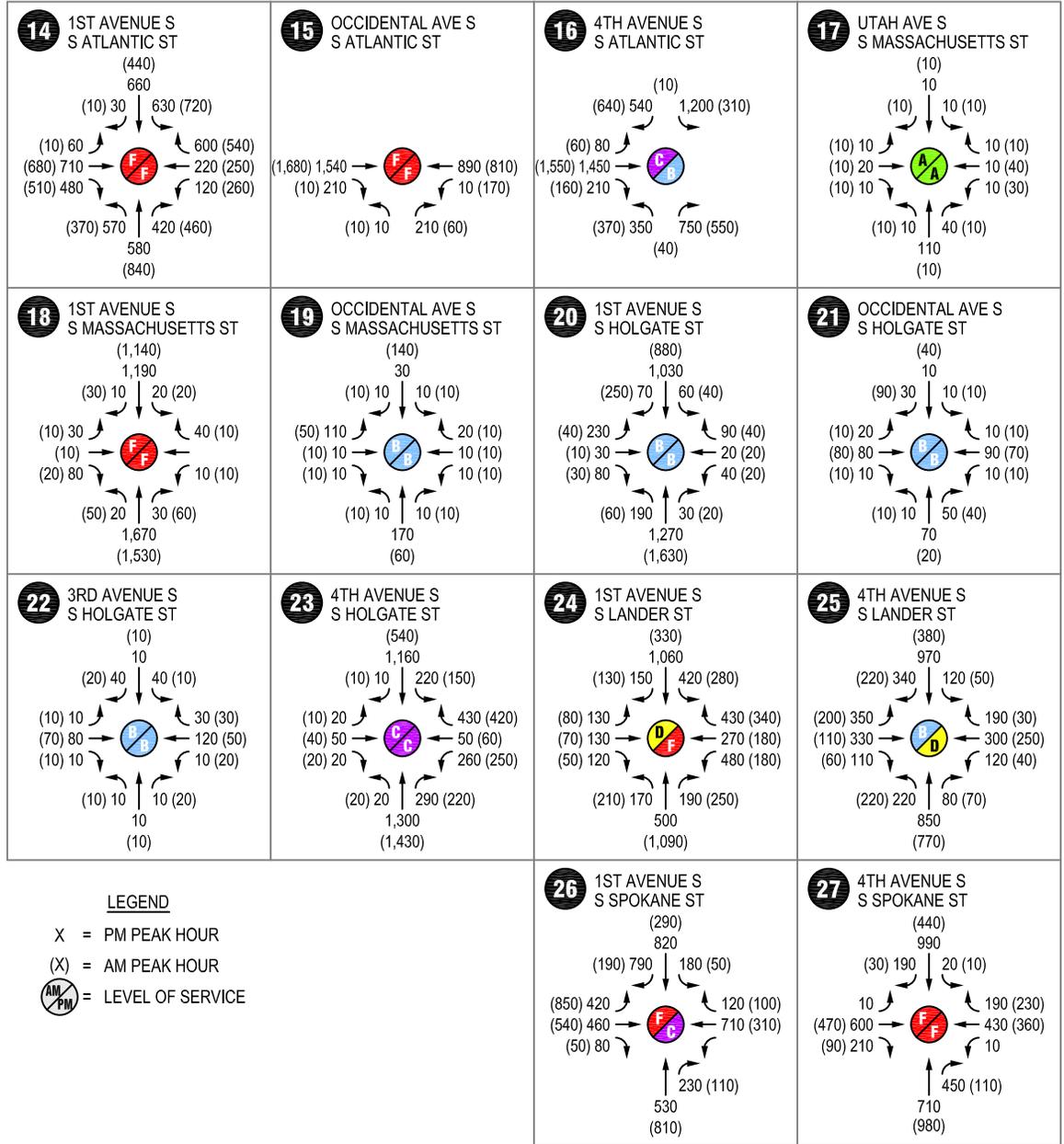
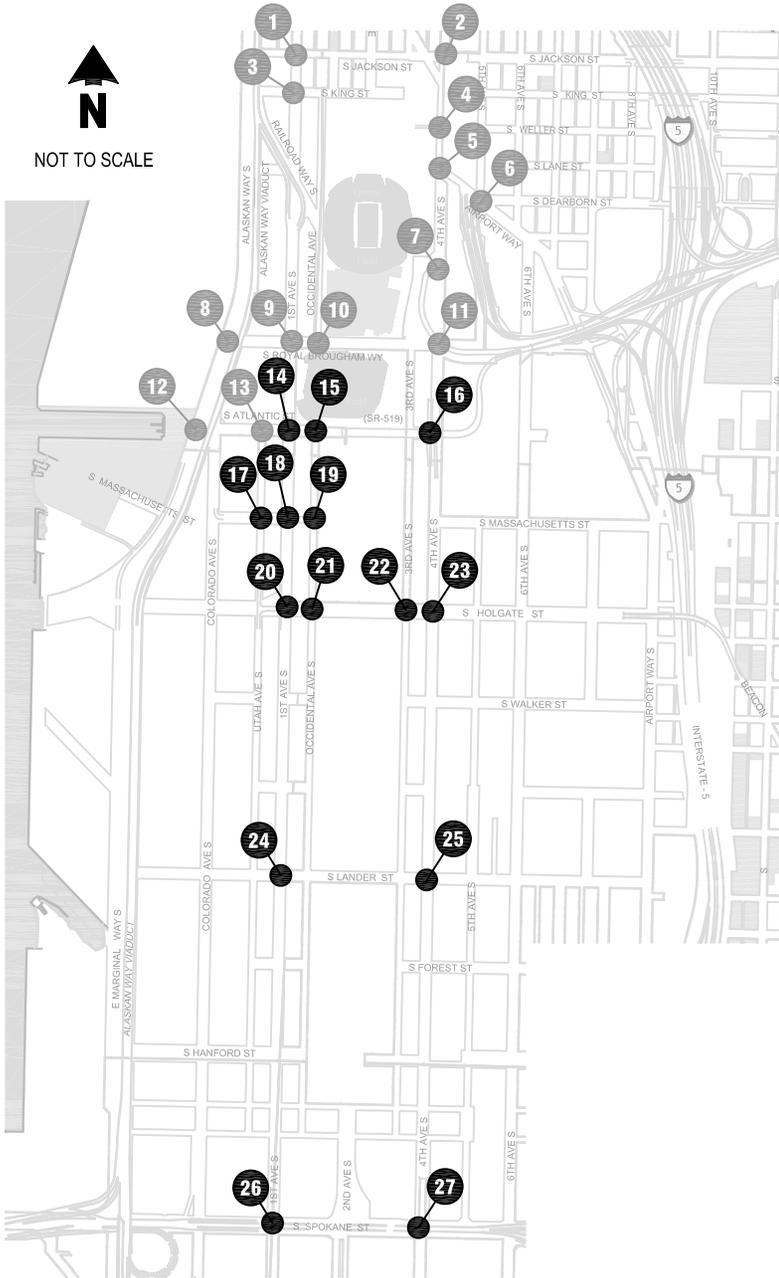


Appendix A-12a

2030 No-Build Peak Hour Traffic Volumes and Intersection Levels of Service (North)

SR 519 Intermodal Access Project, Phase 2

NOT TO SCALE



LEGEND

X = PM PEAK HOUR

(X) = AM PEAK HOUR

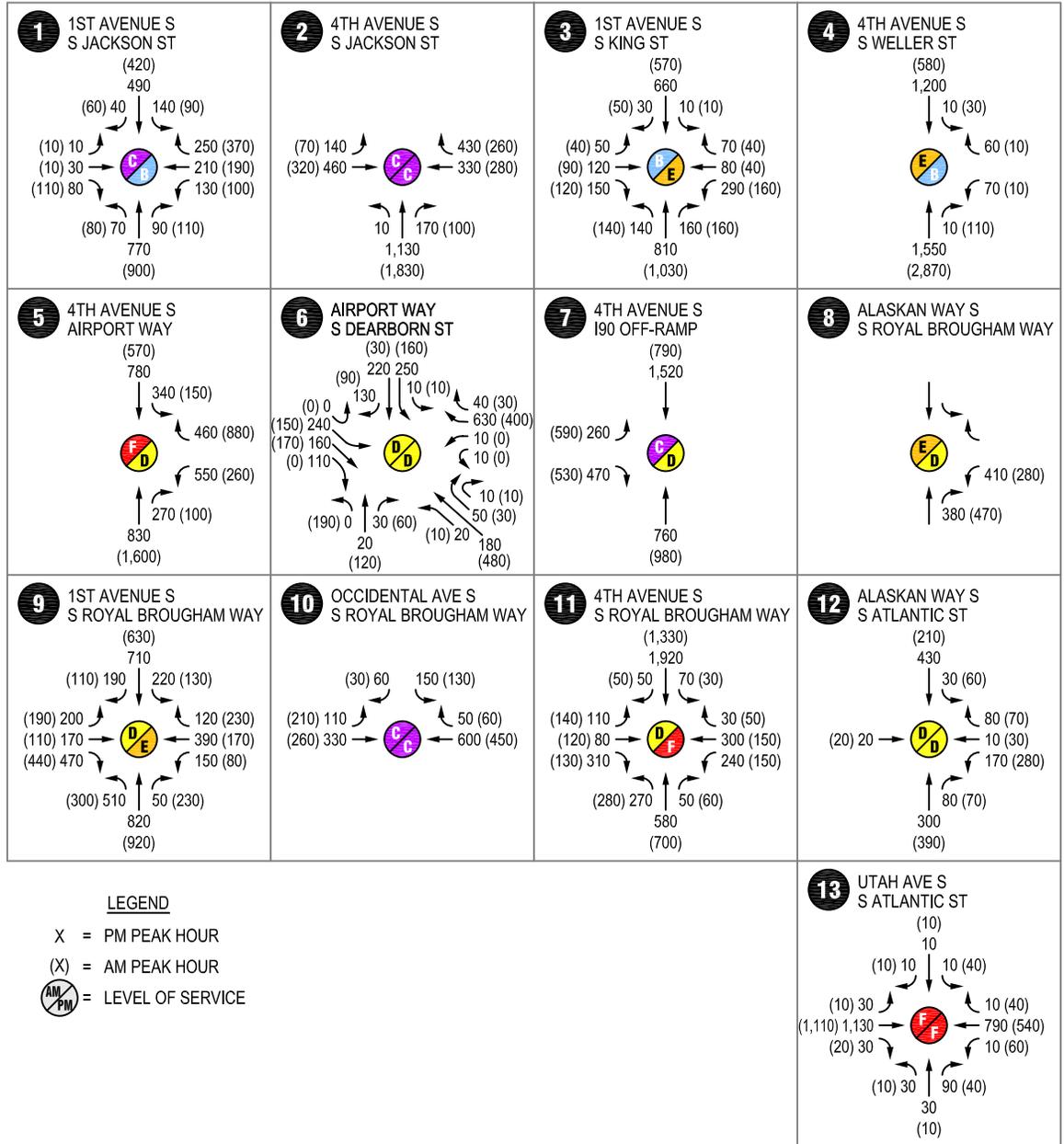
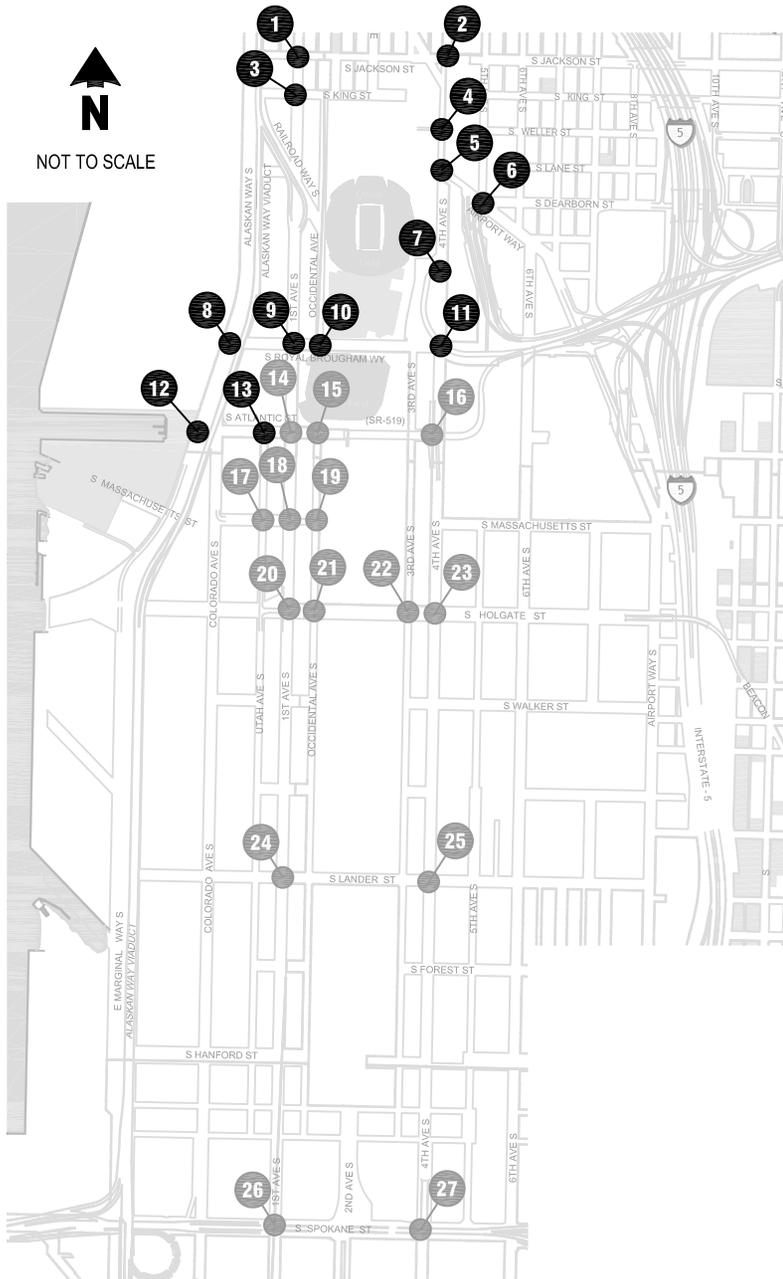
(A/A) = LEVEL OF SERVICE

Appendix A-12b

2030 No-Build Peak Hour Traffic Volumes and Intersection Levels of Service (South)

SR 519 Intermodal Access Project, Phase 2



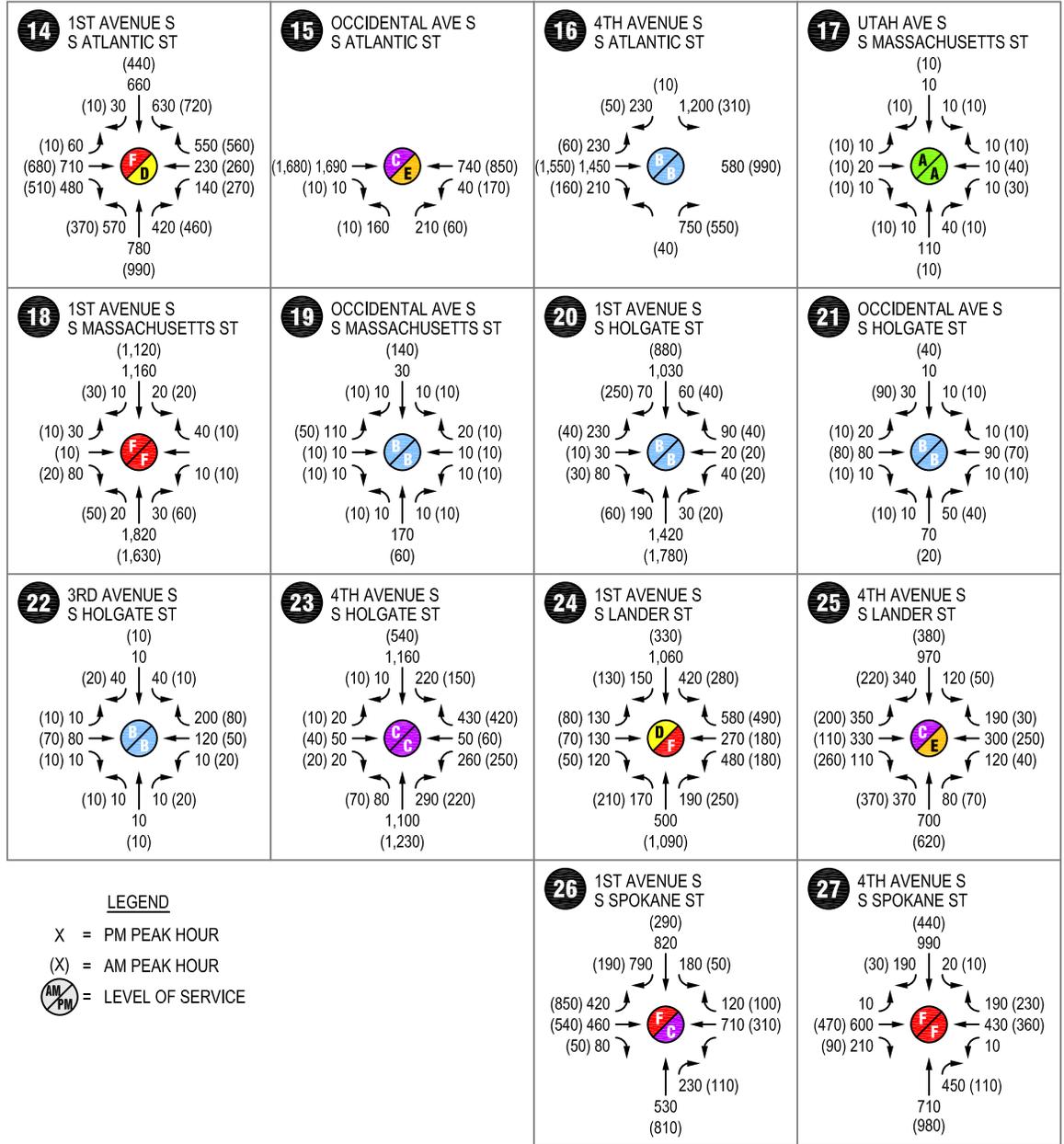
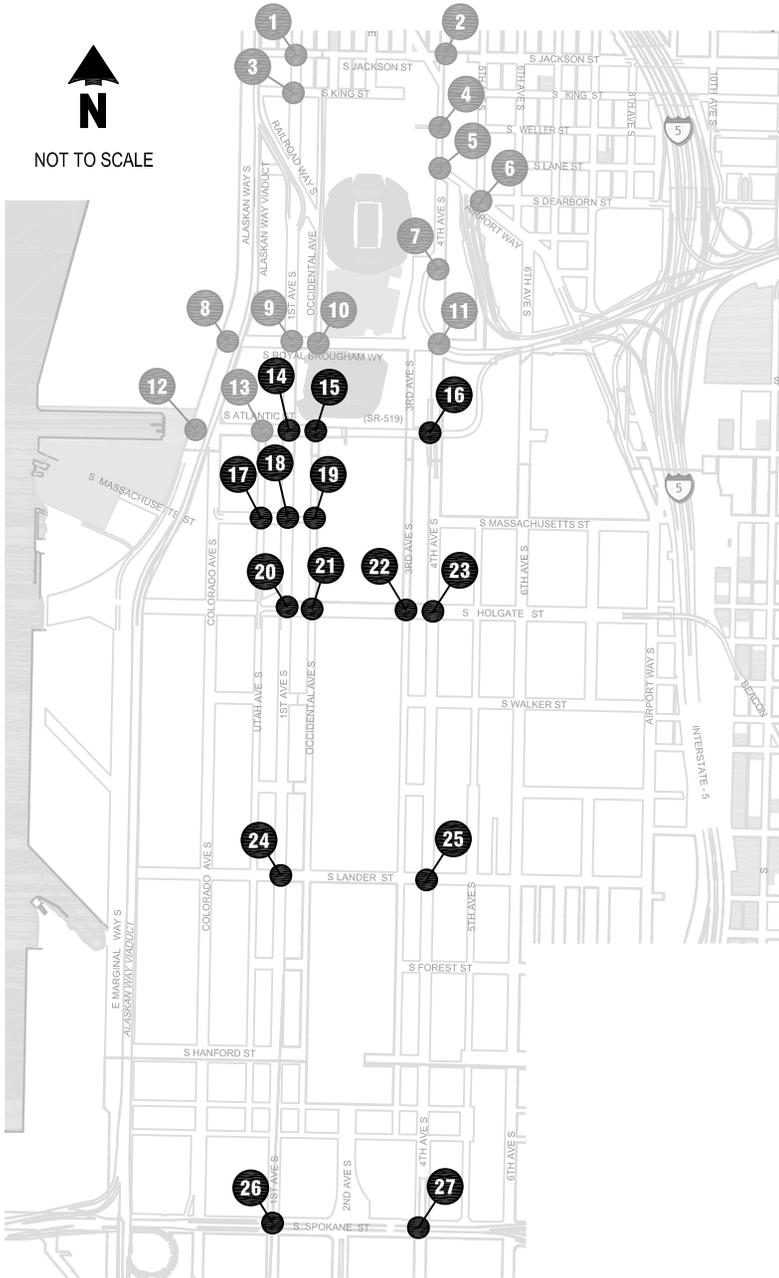


Appendix A-12c

2030 Proposed Action Peak Hour Traffic Volumes and Intersection Levels of Service (North)

SR 519 Intermodal Access Project, Phase 2

NOT TO SCALE



LEGEND

X = PM PEAK HOUR

(X) = AM PEAK HOUR

= LEVEL OF SERVICE

Appendix A-12d

2030 Proposed Action Peak Hour Traffic Volumes and Intersection Levels of Service (South)

SR 519 Intermodal Access Project, Phase 2



Appendix B
Origin-Destination Study

MEMORANDUM

Date: June 22, 2007 **TG:** 05153.02

To: Yonnel Gardes, The Transpo Group

From: Brent Turley, PE, The Transpo Group

cc:

Subject: SR 519 Origin-Destination Study

This memo summarizes the methodology and results of the origin-destination study conducted for the SR 519 project. The purpose of an origin-destination study is to quantify the proportion of traffic traveling from one point of origin to several points of destination, or the proportion of traffic from several points of origin to one point of destination. In the case of the SR 519 origin-destination study, the purpose was to quantify where I-90 and I-5 traffic was oriented once it reached the south downtown area. This information was necessary to model traffic conditions, and appropriately estimate shifts in traffic due to the SR 519 Phase 2 improvements. The results of the study are shown in Attachments 1 through 4.

The study used the license plate matching technique, where license plates at origin and destination locations were recorded and then matched and summarized. License plates were recorded during the AM peak period (6 AM to 9 AM) and the PM peak period (3 PM to 6 PM) in May 2007. Data sets were collected at three origin locations: westbound I-90 mainline, southbound I-5 ramp to westbound I-90, and northbound I-5 ramp to westbound I-90. Data sets were also collected at three destination locations: the eastbound right-turn lanes at the I-90 off-ramp/4th Avenue S intersection; the eastbound left-turn lanes at the I-90 off-ramp/4th Avenue S intersection; and, southbound 4th Avenue traffic passing beneath the S Atlantic Street/4th Avenue S intersection. Trips oriented to other destinations were estimated from these data sets and intersection turning movement counts in the study area. In total, approximately 19,000 license plates were recorded and processed to establish the traffic patterns shown in Attachments 1 through 4.

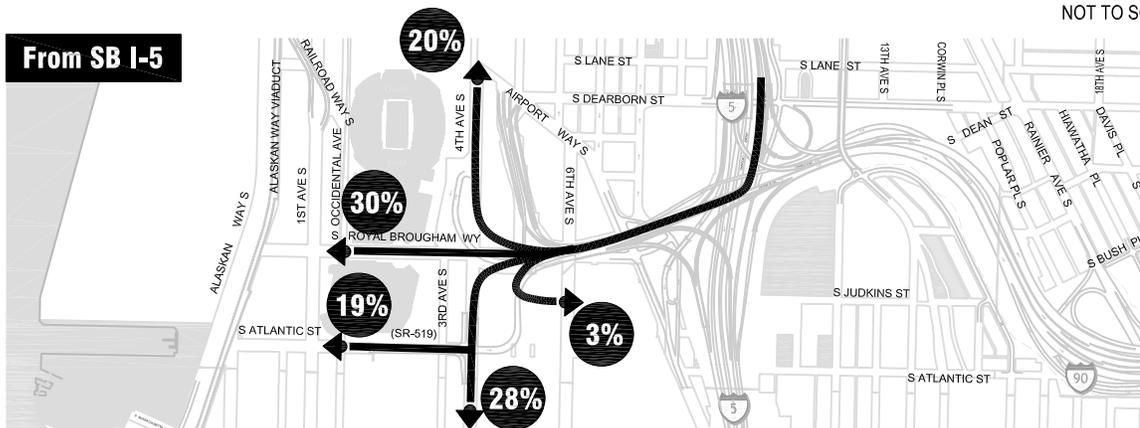
Attachments 1 and 2 show the AM peak period results. Approximately 50 percent of southbound I-5 traffic is oriented south of S Royal Brougham Street. Only 35 and 25 percent of westbound I-90 and northbound I-5, respectively, are oriented south of S Royal Brougham Street. Approximately 70 to 80 percent of I-90 off-ramp traffic at 4th Avenue S comes from the westbound I-90 mainline.

Attachments 3 and 4 show the PM peak period results. Approximately 60 percent of southbound I-5 traffic is oriented south of S Royal Brougham Street. Approximately 50 and 20 percent of westbound I-90 and northbound I-5, respectively, are oriented south of S Royal Brougham Street. Approximately 75 to 85 percent of I-90 off-ramp traffic at 4th Avenue S comes from the westbound I-90 mainline.

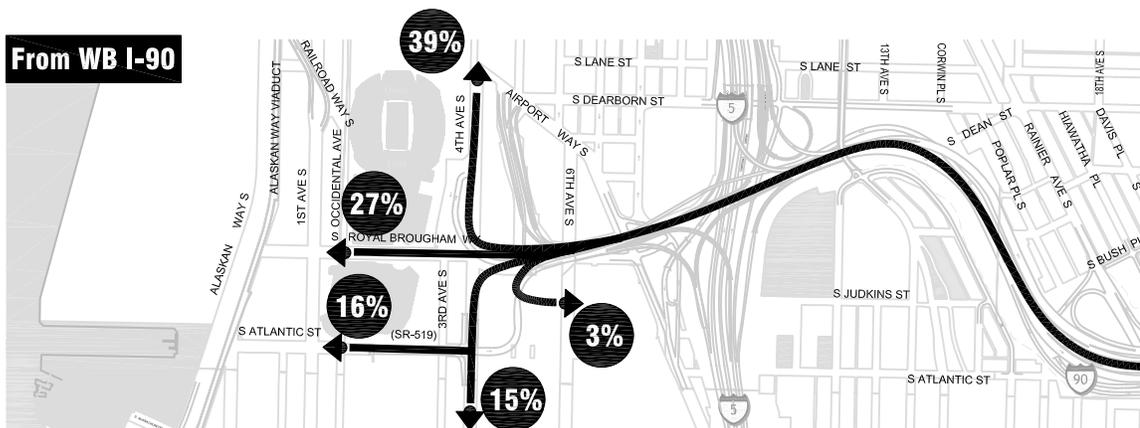


NOT TO SCALE

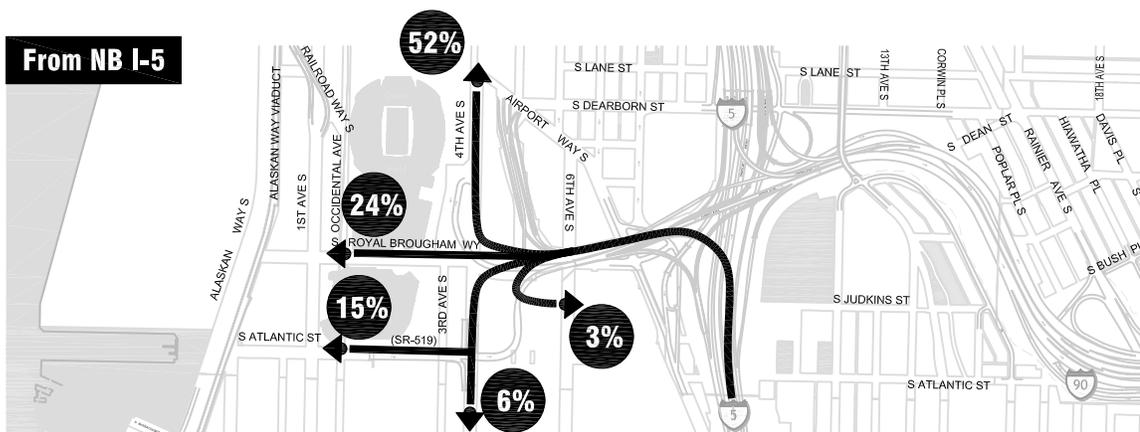
From SB I-5



From WB I-90



From NB I-5



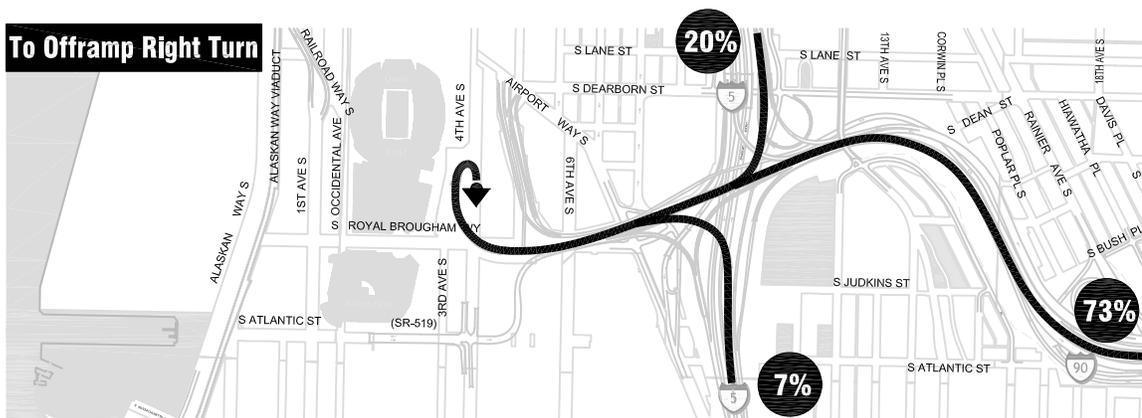
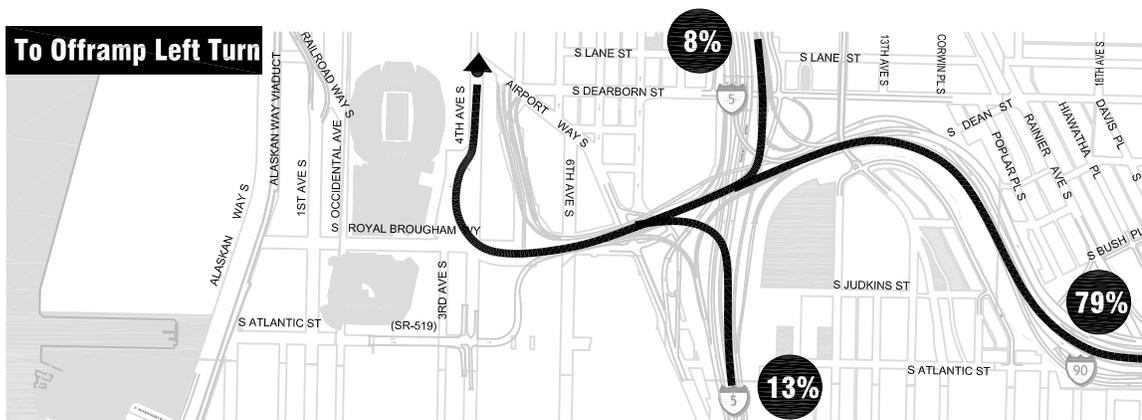
Attachment 1 AM Distribution

SR 519 Phase 2





NOT TO SCALE



Attachment 2

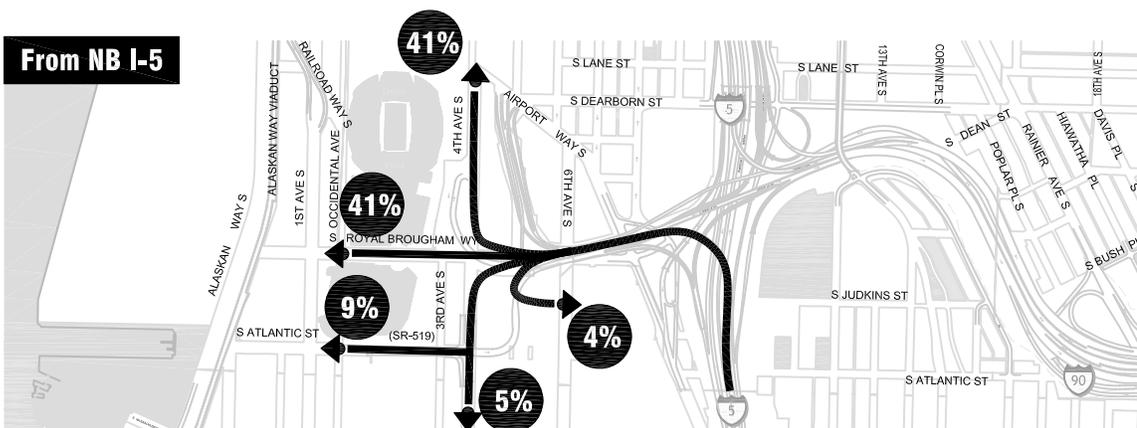
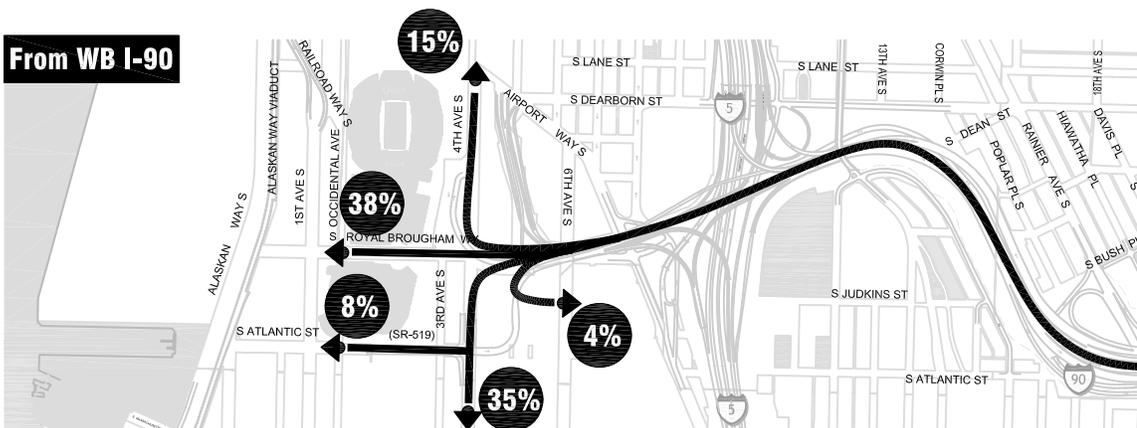
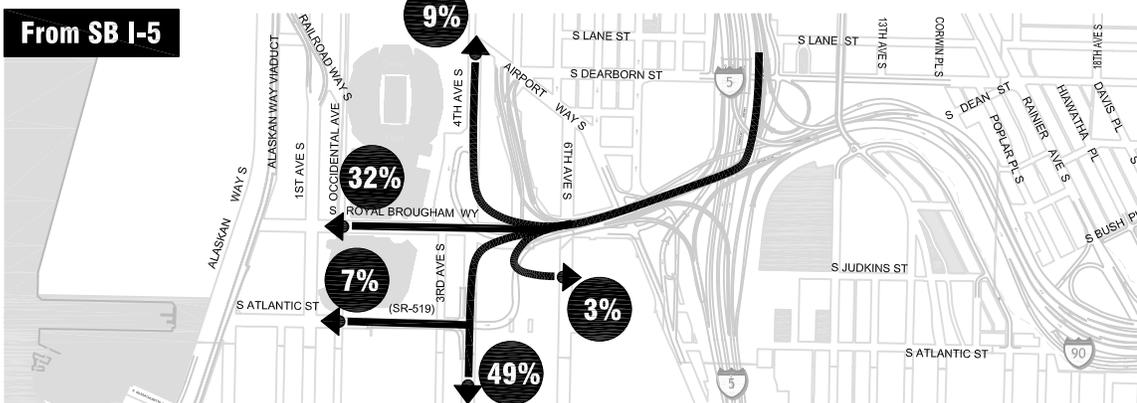
AM Distribution

SR 519 Phase 2





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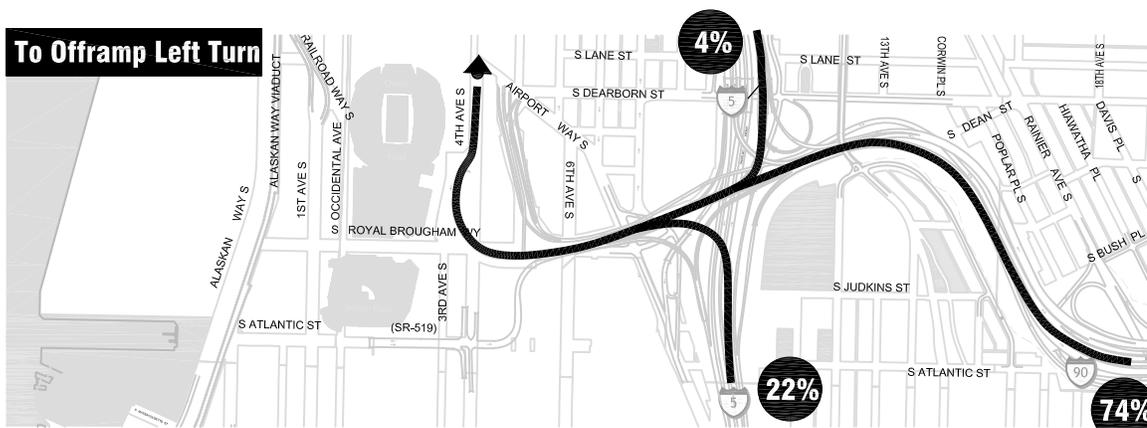
Attachment 3 PM Distribution

SR 519 Phase 2





NOT TO SCALE



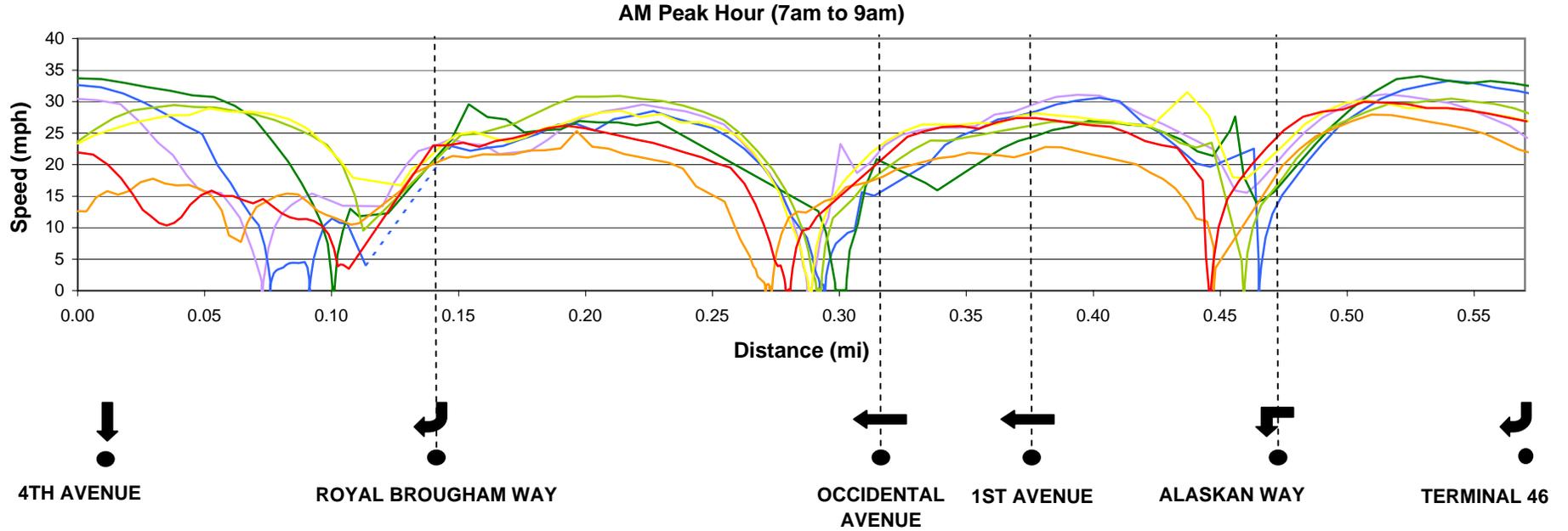
Attachment 4 PM Distribution

SR 519 Phase 2



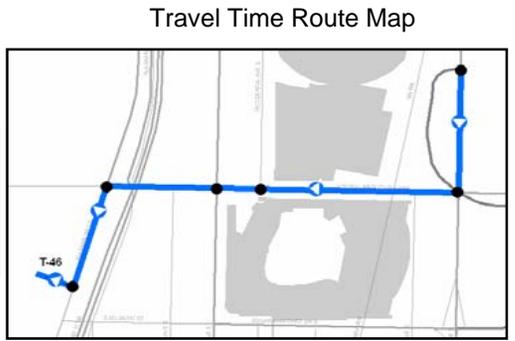
Appendix C

Travel Time Plots



	Run 1	Run 2	Run 3	Run 4	Run 5	Run 6	Run 7	Average
Start Time	7:02:38 AM	7:20:39 AM	7:40:45 AM	8:06:27 AM	8:26:21 AM	8:48:03 AM	8:57:46 AM	-
End Time	7:06:26 AM	7:24:11 AM	7:43:20 AM	8:09:41 AM	8:28:48 AM	8:50:56 AM	9:02:02 AM	-
Total Time	3m, 48s	3m, 32s	2m, 35s	3m, 14s	2m, 27s	2m, 53s	4m, 16s*	3m, 5s

* Travel Times with asterisks by them indicate a travel run impacted by a train crossing; these travel times are not included in the average total travel time.

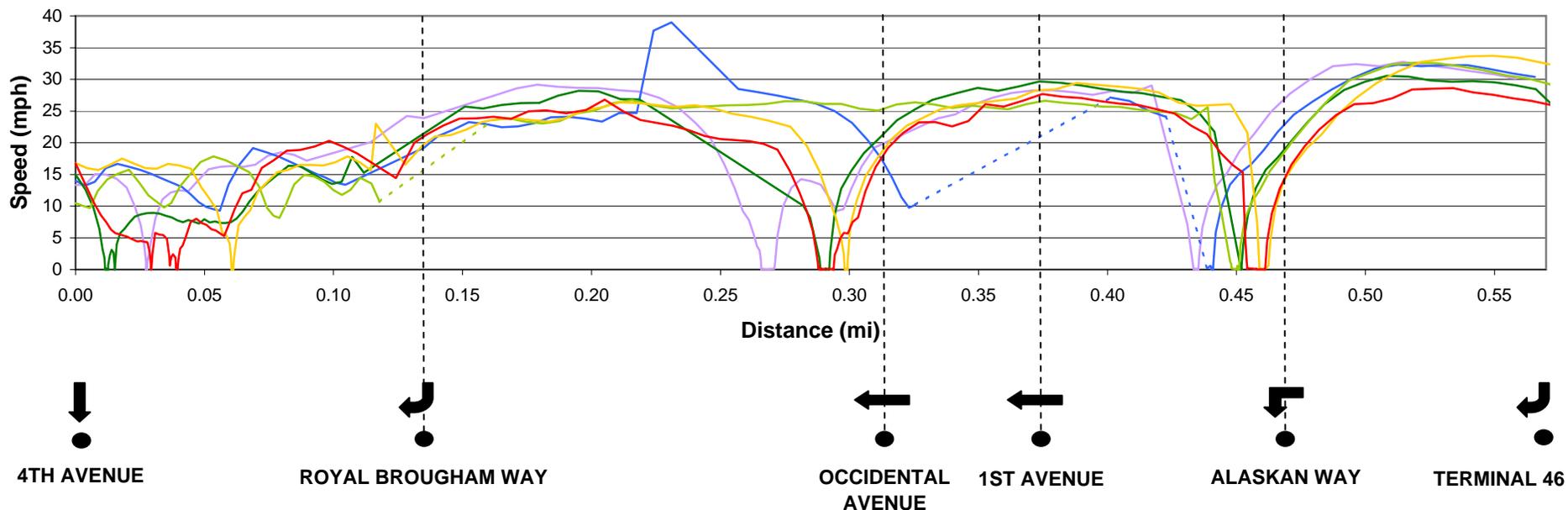


Appendix C-2a

I-90 WB Off-Ramp to Terminal 46 via Royal Brougham Way Travel Times - AM Peak Hour
 SR 519 Intermodal Access Project, Phase 2



PM Peak Hour (4pm to 6pm)



Travel Time Route Map



	Run 1	Run 2 [^]	Run 3	Run 4	Run 5	Run 6	Average
Start Time	4:05:48 PM	4:25:17 PM	4:51:33 PM	5:16:40 PM	5:40:40 PM	5:58:59 PM	-
End Time	4:08:55 PM	4:28:27 PM	4:56:27 PM	5:19:04 PM	5:44:25 PM	6:02:41 PM	-
Total Time	3m, 7s	3m, 10s*	4m, 54s*	2m, 24s	3m, 45s	3m, 42s	3m, 30s

* Travel Times with astericks by them indicate a travel run impacted by a train crossing; these travel times are not included in the average total travel time.

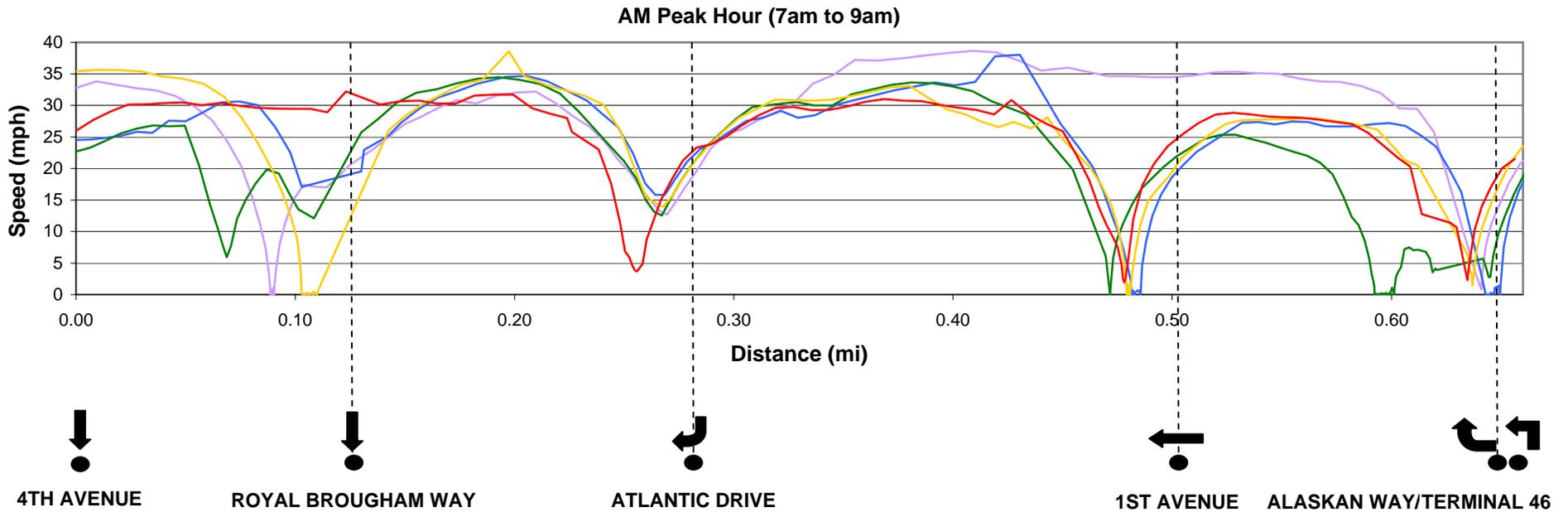
[^]Run 2 had several sections with lost data and some GPS error, accounting for large jumps in speed and travel time over the course of the run.

Appendix C-2b

I-90 WB Off-Ramp to Terminal 46 via Royal Brougham Way Travel Times - PM Peak Hour

SR 519 Intermodal Access Project, Phase 2





	Run 1	Run 2	Run 3	Run 4	Run 5	Average
Start Time	7:12:38 AM	7:30:32 AM	7:52:06 AM	8:16:48 AM	8:40:13 AM	-
End Time	7:15:10 AM	7:34:43 AM	8:00:42 AM	8:20:00 AM	8:42:02 AM	-
Total Time	2m, 32s	4m, 11s	8m, 36s*	3m, 12s	1m, 49s	2m, 56s

* Travel Times with asterisks by them indicate a travel run impacted by a train crossing; these travel times are not included in the average total travel time.

Travel Time Route Map

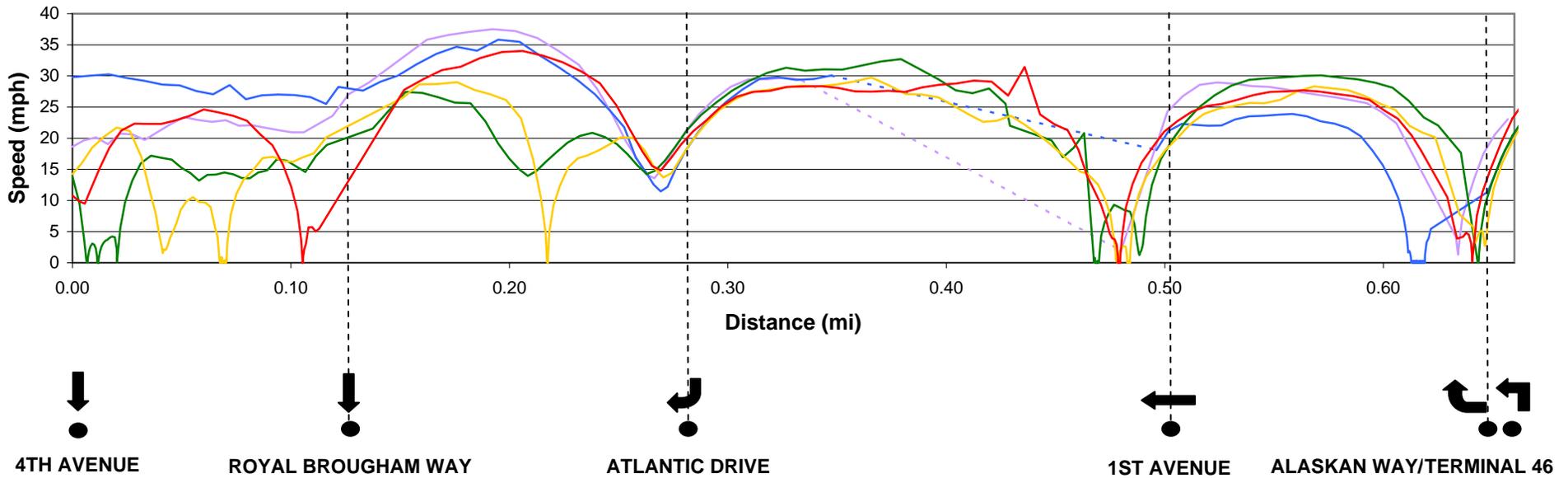


Appendix C-3a

I-90 WB Off-Ramp to Terminal 46 via Atlantic Street Travel Times - AM Peak Hour

SR 519 Intermodal Access Project, Phase 2

PM Peak Hour (4pm to 6pm)



	Run 1	Run 2	Run 3	Run 4	Run 5	Average
Start Time	4:18:16 PM	4:35:00 PM	5:06:12 PM	5:28:55 PM	5:49:53 PM	-
End Time	4:20:23 PM	4:46:42 PM	5:10:25 PM	5:34:09 PM	5:54:09 PM	-
Total Time	2m, 7s	11m, 42s*	4m, 13s	5m, 14s	4m, 16s	3m, 58s

* Travel Times with asterisks by them indicate a travel run impacted by a train crossing; these travel times are not included in the average total travel time.

Travel Time Route Map



Appendix C-3b

I-90 WB Off-Ramp to Terminal 46 via Atlantic Travel Times - PM Peak Hour

SR 519 Intermodal Access Project, Phase 2



Appendix D
Rail Crossing Closure
Observations

APPENDIX D ROYAL BROUGHAM WAY/THIRD AVENUE RAIL CROSSING CLOSURE OBSERVATIONS

<p align="center">AM Royal Brougham Way Crossing Closures <i>Thursday, May 31, 2007</i></p>					
Time	Number	Type	Direction of Travel	Track	Length of Closure
6:55 AM	0	n/a	n/a	n/a	<1 min
6:58 AM	1	Sounder	Southbound	2	2 min (stopped for 30 sec)
7:08 AM	1	Sounder	Southbound	2	1 min
7:16 AM	1	Sounder	Northbound (in reverse)	1	1 min
7:30 AM	2	Sounder	Southbound	2	
		Amtrak			
		Cascades	Southbound	1	3 min
7:44 AM	2	Sounder	Northbound (in reverse)	1	
		Sounder	Southbound	1	2 min
8:02 AM	1	Sounder	Southbound	2	1 min
8:04 AM	1	Sounder	Northbound (in reverse)	1	1 min
8:19 AM	1	Sounder	Southbound	2	2 min
8:23 AM	1	BNSF	Northbound	1	3 min
8:36 AM	0	n/a	n/a	n/a	<1 min
		BNSF			
8:43 AM	1	(locos only)	Northbound	2	<1 min
		BNSF			
8:54 AM	1	(locos only)	Southbound	2	<1 min
8:57 AM	1	Amtrak	Northbound (in reverse)	2	4 min (stopped for 30 sec)
<p align="center">PM Royal Brougham Way Crossing Closures <i>Thursday, May 31, 2007</i></p>					
Time	Number	Type	Direction of Travel	Track	Length of Closure
3:56 PM	1	Amtrak	Northbound	2	2 min
4:04 PM	0	n/a	n/a	n/a	<1 min
4:22 PM	1	Sounder	Southbound	2	1 min
4:23 PM	2	Sounder	Northbound (in reverse)	2	
		Sounder	Northbound (in reverse)	2	2 min
4:46 PM	1	Sounder	Southbound	1	1 min
4:48 PM	0	n/a	n/a	n/a	<1 min
4:49 PM	1	Sounder	Northbound (in reverse)	2	3 min (stopped for 30 sec)
5:11 PM	1	Sounder	Southbound	1	1 min
5:17 PM	1	BNSF	Northbound	2	3 min
		Amtrak			
5:30 PM	1	Cascades	Southbound	1	1 min
5:42 PM	1	Sounder	Southbound	1	1 min
5:53 PM	1	Sounder	Northbound (in reverse)	2	1 min

Appendix E

Safety Analysis

APPENDIX E-1. INTERSECTION COLLISIONS AND SEVERITY

Intersection	Number of Collisions			Total	Annual	Severity	
	2004	2005	2006			PDO ²	Injury ³
1 st Ave S/S Royal Brougham Way	10 (2)	7(1)	10 (1) ¹	27 (3)	9.0	19	8
Occidental Ave S/S Royal Brougham Way	2	2(1)	1	5(1)	1.7	3	2
4 th Ave S/S Royal Brougham Way	7	16 (1)	7	30 (1)	10.0	19	11
S Jackson St/1 st Ave S	4	4	8 (4)	16 (4)	5.3	6	10
S Jackson St/4 th Ave S	3	8	3 (1)	14 (1)	4.7	10	4
S King St/1 st Ave S	5	3	4	12	4.0	9	3
S Weller St/4 th Ave S	0	0	0	0	0.0	0	0
Airport Way S/4 th Ave S	4	1	0	5	1.7	4	1
I-90 Off Ramp/4 th Ave S	1	3	1(1)	5(1)	1.7	4	1
Alaskan Way/S Royal Brougham Way	1	1	1	3	1.0	2	1
Alaskan Way/S Atlantic St*	3(1)	2	1	6(1)	2.0	5	1
Utah Ave S/S Atlantic St*	0	0	0	0	0.0	0	0
1 st Ave S/S Atlantic St	8	7 (1)	6	21 (1)	7.0	12	9
Occidental Ave S/S Atlantic St*	0	0	1	1	0.3	1	0
4 th Ave S/S Atlantic St	8	7	1	16	5.3	7	9
Utah Ave S/S Massachusetts St	2	0	0	2	0.7	1	1
1 st Ave S/S Massachusetts St*	0	0	0	0	0.0	0	0
Occidental Ave S/S Massachusetts St*	0	0	0	0	0.0	0	0
1 st Ave S/S Holgate St	0	1	2	3	1.0	2	1
Occidental Ave S/S Holgate St*	0	0	2	2	0.7	2	0
3 rd Ave S/S Holgate St*	1	0	1	2	0.7	2	0
4 th Ave S/S Holgate St	4 (2)	4	4	12 (2)	4.0	9	3
1 st Ave S/S Lander St	5	6	3 (2)	14 (2)	4.7	11	3
4 th Ave S/S Lander St	2	0	5	7	2.3	3	4
1 st Ave S/S Spokane St	12	19	15	46	15.3	38	8
4 th Ave S/S Spokane St	7	6	9 (1)	22 (1)	7.3	11	11
5 th Ave S/Airport Way S	3	1	2	6	2	4	2
Colorado Ave S/S Atlantic St*	0	0	0	0	0	0	0

*. Unsignalized intersection.

1. Number of collisions involving pedestrians/bicyclists shown in parenthesis

2. Reported collisions with property damage only (3-year total)

3. Reported collisions resulting in injuries (3-year total)

APPENDIX E-2 SURFACE STREET SEGMENT COLLISIONS AND SEVERITY

Roadway Segment between 1 st Ave S and 4 th Ave S	Number of Collisions			3-Year	Annual Average	PDO ¹	Injury ²
	2004	2005	2006				
S Royal Brougham Way	6	4	4	14	4.7	10	4
S Atlantic St	10	6	1	17	5.7	13	4
S Holgate St	0	1	1	2	0.7	1	1
S Lander St	4	5	4	13	4.3	13	0

1. Reported collisions with property damage only (3-year total)

2. Reported collisions resulting in injuries (3-year total)

APPENDIX E-3 FREEWAY MAINLINE COLLISIONS AND SEVERITY

I-90 West-bound Mainline Section	MP Range	Number of Collisions				3-Year Total	Annual Average	Length (miles)	AADT	Collision per MVMT ¹	WSDOT			Pre-dominant Accident Type
		2004	2005	2006	2007						NW Region Average	PDO ²	Injury ³	
End Tunnel to I-5 NB off-ramp	3.52 – 2.79	22	32	26	80	26.7	0.78	59,000	1.6	1.5	53	27	Rear-End	
I-5 NB off-ramp to 4 th Ave.	2.79 – 1.94	10	8	10	28	9.3	0.85	15,000	2	1.5	19	9	Rear-End	

1. MVMT = Million vehicle miles traveled
2. Reported collisions with property damage only (3-year total)
3. Reported collisions resulting in injuries (3-year total)

APPENDIX E-4 FREEWAY RAMP COLLISIONS AND SEVERITY

I-90 Westbound / I-5 interchange	Number of Collisions			3-Year Total	Annual Average	PDO ¹	Injury ²
	2004	2005	2006				
WB I-90 Off-ramp to NB I-5	9	6	9	24	8.0	13	11
WB I-90 Off-ramp to SB I-5	2	5	8	15	5.0	11	4
SB I-5 On-ramp to WB I-90	1	0	0	1	0.3	1	0
NB I-5 On-ramp to WB I-90	1	0	0	1	0.3	1	0

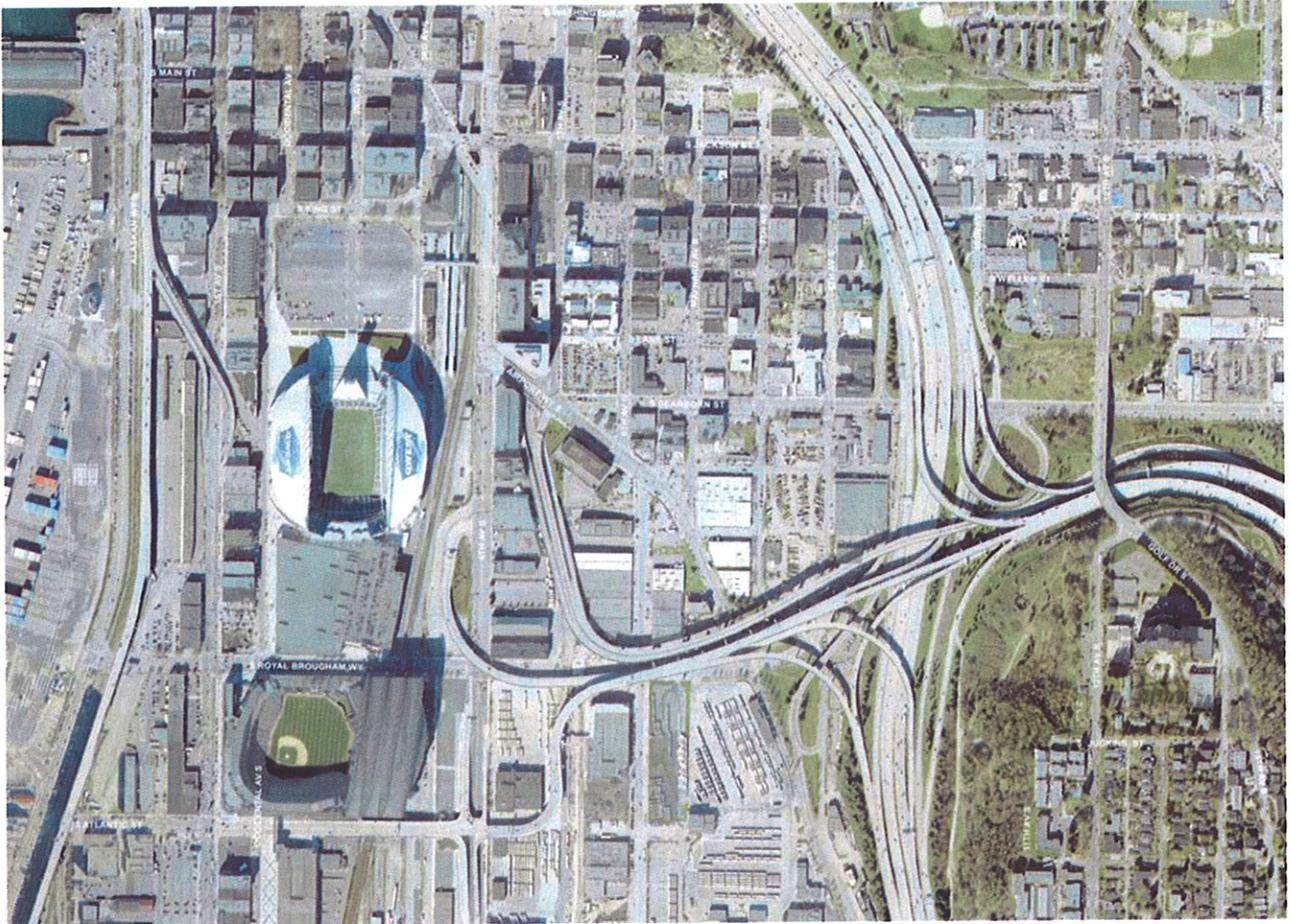
1. Reported collisions with property damage only (3-year total)

2. Reported collisions resulting in injuries (3-year total)

Appendix F
Interchange Justification Report
Methodology and Assumptions



SR 519 Intermodal Access Project, Phase 2 Interchange Justification Report– Methodology and Assumptions



The undersigned parties concur with the Interchange Justification Report - Methodology and Assumptions for SR 519 Intermodal Access Project, Phase 2.

WSDOT

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Barbara De Ste. Croix

Access & Hearings Manager

Title:

May 30, 2007

Date

Mark Bandy

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WFO TRAFFIC ENGINEER

Title:

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SR 519 Phase 2 Intermodal Access Project Description

Phase 2 of the SR 519 Intermodal Access Project will increase mobility and safety by improving connections between I-5, I-90 and the Port of Seattle, State Ferry Terminal, sports stadiums and events center. The project will benefit all modes of travel; including trucks serving the Port of Seattle's container terminals, freight and commuter trains using the Burlington Northern Santa Fe (BNSF) rail line, and ferry riders going to Colman Dock. The project will improve safety for pedestrians and bicyclists in the project area as they travel between home, work, transit and event facilities.

The project includes the following improvements:

- A new, two-lane elevated ramp connection from westbound I-90 to South Atlantic Street (Edgar Martinez Way). The new Atlantic Street connection will serve westbound freeway traffic from I-90 and I-5. The new ramp, which is approximately 1,200 feet long, will be entirely elevated, passing over 4th Avenue South and connecting to the South Atlantic Street Structure, east of Safeco Field.
- The S. Royal Brougham Way at-grade railroad crossing will be closed and a new 2-lane elevated loop-ramp structure will be constructed. The new overpass will transport both vehicular and pedestrian/bicycle traffic over the BNSF railroad tracks, and includes a new vehicular connection into the Qwest Field Exhibition Center. The new ramp, which is approximately 1,300 feet long, will accommodate local, 2-way traffic.
- Improvements to the intersection of 1st Avenue South and S. Atlantic Street. The intersection will be widened to add additional turn lanes on each approach. Existing parking lanes along 1st Avenue South will be converted into travel lanes, with a new eastbound lane added to S. Atlantic Street.

Study Area

The freeway traffic study area will extend from west of the Mount Baker Ridge tunnel to the terminus of the 4th Avenue ramp, the I-90 Express lanes at Airport Way and the new Atlantic Street ramp.

Surface street operational analysis will extend north to south from the north side of Jackson Street to the south side of Lander Street and east to west from the west side of Alaskan Way to the east side of 4th Avenue.

The travel demand forecasting area will generally extend north to south from Jackson Street to the Spokane Viaduct and east to west from Alaskan Way South/East Marginal Way to Mount Baker Ridge.

A map of the study area is shown on Figure 1.

Design Year and Opening Year

The assumed year of opening will be 2011. The design year is 2030.

Study Period

Intersection operations will be analyzed for the AM and PM single peak hour. Freeway operations will use a two-hour analysis for AM and PM peak periods (typical weekday conditions) for existing conditions and each horizon year. Corridor operations will use a one hour analysis for AM and PM peak periods for existing conditions and horizon years. Events will be considered in the NEPA process.

Intersection Operations Analysis

Surface street impacts will be evaluated using the Synchro model at signalized intersections including interchange ramp intersections.

Existing signal timings will be used to analyze existing conditions. The most recent traffic counts available (under non-event conditions) will be used for weekday AM and PM peak conditions. No turning movement counts older than 2003 will be used.

Opening year and design year conditions will be analyzed with optimized signal timings based on forecast volumes.

Intersection performances will be evaluated and documented based on Highway Capacity Manual procedures.

Freeway Operations Analysis

The VISSIM microsimulation model will be used to analyze freeway mainline and ramps operations. Merging, weaving, diverging and ramp terminus will be considered in this analysis.

The VISSIM freeway network will include the westbound section of I-90 starting at the Mount Baker tunnel and extending to the terminus of the 4th Avenue ramp, the I-90 Express lanes at Airport Way and the new Atlantic Street ramp.

Freeway VISSIM models will be built to analyze weekday AM and PM peak two-hour operations for existing conditions, 2011 and 2030. The following scenarios will be included in the IJR:

- 2007 Base Year
- 2011 No-Build
- 2011 Build Alternative
- 2030 No-Build
- 2030 Build Alternative

The existing conditions model will be based on existing counts (freeway ramps and mainline) and a new origin-destination survey to be conducted between the I-90/I-5 interchange and the stadium area.

The FHWA report “Guidelines for Applying Traffic Microsimulation Modeling Software” will be used to develop and calibrate the VISSIM model. It is assumed that no HCS analysis will be required.

Microsimulation results will be measured in terms of density, volume throughput, speeds and queue lengths.

Corridor Operations Analysis

The VISSIM freeway models previously described will be extended to include the surface streets covered in the Synchro network. Roadway geometry, channelization, signal timings and traffic volumes will be coded appropriately and will be consistent with the information used in the Synchro and Vissim freeway models.

The VISSIM corridor models will be built for 2007, 2011 and 2030 AM and PM peak conditions. The 2011 and 2030 models will consider a No-Build and a Build Alternative.

The VISSIM corridor models will be used to analyze corridor travel times (including key freight routes) on selected east-west and north-south routes. Up to four routes will be studied for both directions.

Travel Demand Forecasting

2030 Baseline Model

Travel demand forecasts for 2030 will be based on the current version of the City of Seattle 2030 transportation model. The City model is consistent with the PSRC regional model and accounts for regional travel patterns. It is multimodal and accounts for transit and expected changes in mode share.

AM and PM peak traffic volumes for 2030 will be estimated from the City’s model 3-hour AM and PM peak period forecasts using conversion factors obtained from existing traffic counts.

A review of the 2030 City model will be conducted to determine if changes in land use and transportation projects are required in the study area to develop the 2030 Baseline Model for the SR 519 project (2030 No-Build).

The 2030 Baseline Model for SR 519 should include major development and transportation projects currently identified in adopted regional and local plans.

Known development projects in the Stadium districts to be considered include:

- Stadium Silver Cloud Hotel
- Utah Street Home Plate
- North Parking Lot
- Over the Tracks
- Goodwill Site

Transportation projects assumed to be in place in the 2030 Baseline are:

- Alaskan Way South End with 10C configuration
- Holgate Street closed to through traffic between 3rd Avenue S. and 1st Avenue S.
- Grade separation at Lander Street
- I-90 reconfiguration with one HOV lane added in each direction on outside roadway and center roadway reserved to light rail (option R8A).
- Spokane Viaduct Phase 2 & 3.
- WSF expansion of Colman Dock and remote holding area
- Sound Transit improvements (Sound Move)

The SR 519 Baseline Model will be closely coordinated with the AWV 2030 Baseline Model in consultation with the AWV project team.

2011 Baseline Forecasts

Estimates of 2011 baseline traffic forecasts (2011 No-Build) will be prepared based on estimation and application of growth rates to existing counts.

These growth rates will account for:

- Historical growth rates
- Identified development projects
- Transportation projects completed
- Transportation projects under construction and their anticipated impact within the study area.

2011 and 2030 Build Alternative Forecasts

The baseline forecasts will be expanded to prepare estimates of 2011 and 2030 Build traffic forecasts for study area roadways and intersections. The 2030 Baseline Model will be updated to account for the Build alternative improvements.

Possible shifts in traffic resulting from the Build alternative implementation will be estimated by performing “select links” on the citywide model. All raw model volumes will be post-processed to account for model limitations identified during the calibration of the base year model.

Safety Analysis Methodology

The analysis of existing conditions within the study area will include a review of recent collision data. Collision data for study area intersections and freeway system has been requested from the City of Seattle and Washington State Department of Transportation (WSDOT) for the most recent three years for which data is available. This data will be reviewed and summarized to identify collision rates and trends within the study area.

In addition, locations identified by WSDOT as either a High Accident Location (HAL) or High Accident Corridor (HAC) have been requested. A HAL is defined as a spot location, less than 1 mile long, determined to have a higher-than-average rate of severe accidents during the previous two years. A HAC is a section of a state highway longer than 1 mile, which has a higher-than-average number of severe accidents over a continuous time period.

The historical accident data will be used to calculate accident rates and identify accident trends. Locations where accident rates are identified as being higher than average or locations where fatal collisions or collisions involving non-motorized roadway users will be further evaluated. The analysis of the impacts associated with the proposed project will include an evaluation of potential adverse impacts to locations identified as having existing safety deficiencies. Potential mitigation measures to reduce/offset adverse safety impacts associated with the proposed project will then be identified/evaluated.