Each alternative was evaluated by the design team based on a broad set of criteria developed to accomplish the purpose and need of the SR-519 Phase 2 project. Table 5-1 describes the criteria used to evaluate each alternative.

The criteria were developed based on a review of the existing data, and the known stakeholder concerns.

Each of the three alternatives selected for further analysis would route much of the westbound traffic further south than the original Phase 2 design. Westbound traffic is routed directly to South Atlantic Street in Alternatives A and A + B. This would remove the heavy freight-related traffic volumes from South Royal Brougham Way to the south, away from South Royal Brougham Way.

Three alternatives (A, B, and A + B) were further refined and analyzed based on the following evaluation criteria:

- Traffic level of service at critical intersections
- Travel times across the corridor
- Preliminary cost estimates
- Contextual analysis (See Section 7)

Evaluation Criteria	Description
1-Purpose	Regional transportation, truck freight mobility, rail mobility, and safety • Connect I-90 and I-5 to the waterfront. • Improve freight mobility. • Ready access from I-90 to container terminal and cruise terminal. • Grade separations or road closure. • Improve safety.
2-Sensitivity	Connect Seattle communities and regions. Local communities include SODO and industrial area of Seattle, which encompasses the 'stadium district' – Safeco Field and Qwest Stadium • Help create and maintain the "feel" of each community. • Achieve acceptable level of service for transportation within and between communities. • Avoid 'freeway off-ramp' sense at Stadium District. Maintain and expand as necessary (pedestrian plaza) and promote use of the ballpark facilities to maintain or increase revenues. • Promote good traffic and transportation (private and public) access to facilities. • Promote and maintain a pedestrian-friendly environment around its facilities especially in and around South Royal Brougham Way.
3-Cost	• Construct as close as possible to current budget.
4-Flexibility	• Minimize negative impact on future growth or expansion of area.
5-Phasing	• Implement easily in phases.

Table 5-1 – Evaluation Criteria

Modeling Approach

A traffic model was built to represent existing and future traffic conditions in the SODO area and evaluate the various alternatives. The model focused on 1st Avenue South and 4th Avenue South between South Royal Brougham Way and South Massachusetts Street. The analysis was done for the evening peak period under non-event conditions.

The City of Seattle travel demand model was used to generate traffic growth rates for the area between 2000 and 2030. Land use assumptions for 2000 and 2030 are embedded in the City models. The analysis of existing traffic conditions is summarized in Appendix E. Based on the latest traffic counts available (collected in 2004 and 2005), the growth rates were used to estimate evening peak period volumes and resulting intersection turning movements in 2030. Specific truck traffic volume projections for Port of Seattle Terminal 46 were accounted for using information from other studies as provided by the Port of Seattle.

All 2030 alternatives studied assume that the Concept 10C is implemented for the Alaskan Way Viaduct south end configuration (See Appendix B). All 2030 alternatives also assume that Lander Street has a grade-separated crossing and a total of four lanes.

The original phase 2 concept was analyzed for comparison purposes. The traffic analysis for this concept is presented in Appendix F.

All 2030 alternatives, namely: A, B, A + B, and the No Build Option, were analyzed under different assumptions for South Royal Brougham Way and South Holgate Street. By 2030, it is considered that one or both of these streets are likely to be closed to traffic. If they are to remain open with at-grade crossings, their capacity

would be reduced due to increased rail traffic affecting the performance of the at-grade crossings. The model assumptions are that by 2030 South Royal Brougham Way would lose 33 percent of its capacity (2 lanes in each direction instead of three) and South Holgate Street would lose 75 percent of its capacity.

Volume forecasts for 2030 were based on a redistribution of east-west traffic among available crossings under the different sets of assumptions for the future capacity at Lander Street, South Holgate Street and South Royal Brougham Way. Detailed 2030 volume forecasts for Alternatives A, B, A + B and No-Build are presented in Appendix G.

Preliminary traffic analysis of Alternatives A and B for 2020 traffic conditions were also performed and are reported in Appendix H.

Intersection Level of Service Analysis

The 2030 volume forecasts were used to generate turning movements and perform intersection level of service analysis based on the Highway Capacity Manual Methodology. Six critical intersections were studied in detail: three intersections along 1st Avenue South (at South Royal Brougham Way, South Atlantic Street and South Massachusetts Street) and three intersections along 4th Avenue South (at I-90 off-ramp, South Royal Brougham Way and South Atlantic Street).

Three intersections (1st Avenue South/South Atlantic Street, 1st Avenue South/South Massachusetts Street and 4th Avenue South/South Atlantic Street) have different channelization schemes depending on which alternative is considered. Details on channelization assumptions are presented in the analysis of each alternative result and in Appendix A.

Cycle lengths, signal timings, and offsets were optimized for each alternative and set of assumptions using Synchro software. The same optimized cycle length was applied to all six intersections. Optimized cycle lengths vary between 80 and 120 seconds.

Detailed level of service results for the 2030 No Build Option and 2030 Alternatives are provided in Tables 5-2 and 5-3. The 2030 No Build Option assumes that the only improvements implemented are: AWV south end 10C concept, channelization improvements at 1st Avenue South and South Atlantic Street, new signal and channelization at 1st Avenue South and South Massachusetts Street, and grade separation at Lander Street. Table 5-2 presents the level of service results with the assumption of South Holgate Street open with reduced capacity, while Table 5-3 presents the results with the assumption of South Holgate Street being closed. Both tables present the results with South Royal Brougham Way either open at reduced capacity or closed.

	No Build Option		Alternative A		Alternative B		Alternative A + B	
	LOS[1] (Delay[2])	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Intersection	**(1)**	**(2)**	**(1)**	**(2)**	**(1)**	**(2)**	**(1)**	**(2)**
1st Ave S/S Royal Brougham Way	D (36)	E (56)	D (41)	D (55)	C (32)	D (40)	D (41)	D (53)
1st Ave S/S Atlantic St	E[3] (71)	F (125)	F (80)	F (120)	C (21)	C (30)	C (20)	C (32)
1st Ave S/Massachusetts St	A (10)	B (11)	B (11)	B (11)	C (25)	D (38)	C (25)	D (39)
4th Ave S/I-90 Off Ramp	D (49)	C (35)	C (20)	C (20)	D (40)	D (47)	B (20)	C (20)
4th Ave S/Royal Brougham Way	C (23)	E (64)	B (17)	B (28)	D (39)	C (34)	B (18)	C (28)
4th Ave S/S Atlantic St	F (97)	F (151)	E (66)	F (96)	E (62)	F (89)	E (67)	F (96)
TOTAL	**286**	**442**	**235**	**371**	**219**	**278**	**191**	**268**

1. Level of service, based on 2000 Highway Capacity Manual methodology.
2. Average delay in seconds per vehicle.
3. With 1st/Atlantic Improvements.

Table 5-2 – 2030 Forecast Level of Service Summary: South Holgate Street Open with Reduced Capacity, South Royal Brougham Way Open Reduced (1) or Closed (2)

	No Build Option		Alternative A		Alternative B		Alternative A + B	
	LOS[1] (Delay[2])	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Intersection	**(3)**	**(4)**	**(3)**	**(4)**	**(3)**	**(4)**	**(3)**	**(4)**
1st Ave S/S Royal Brougham Way	D (44)	D (49)	D (39)	D (49)	D (36)	D (40)	D (42)	D (52)
1st Ave S/S Atlantic St	F (88)	F (151)	F (104)	F (151)	C (24)	D (35)	C (27)	D (39)
1st Ave S/Massachusetts St	B (14)	B (13)	B (12)	B (13)	C (26)	D (44)	D (26)	D (48)
4th Ave S/I-90 Off-Ramp	C (30)	E (73)	C (21)	C (25)	D (49)	E (73)	B (20)	C (25)
4th Ave S/Royal Brougham Way	D (47)	C (23)	B (16)	C (22)	C (25)	C (23)	B (18)	C (22)
4th Ave S/S Atlantic St	F (130)	F (170)	F (88)	F (120)	F (83)	F (111)	F (86)	F (120)
TOTAL	**353**	**479**	**280**	**380**	**243**	**326**	**219**	**306**

1. Level of service, based on 2000 Highway Capacity Manual methodology.
2. Average delay in seconds per vehicle.
3. With 1st Avenue South/South Atlantic Street Improvements.

Table 5-3 – 2030 Forecast Level of Service Summary: South Holgate Street Closed, South Royal Brougham Way Open Reduced (3) or Closed (4)

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)

Table 5-4 – Level of Service Criteria for Signalized Intersections

Alternative A

Alternative A would improve operations at three intersections (out of six) along 1st Avenue South and 4th Avenue South. Both the intersection of 1st Avenue South and South Atlantic Street and the intersection of 4th Avenue South and South Atlantic Street would operate at LOS E or F, and further refinements would be required at these intersections.

Alternative A improves the total intersection delay measured across the six intersections being studied compared to the No Build Option. The reduction of overall delay due to Alternative A varies depending on the assumptions for South Royal Brougham Way and South Holgate Street.

Alternative B

Alternative B would improve operations at four intersections (out of six) along 1st Avenue South and 4th Avenue South. When either Holgate Street or Royal Brougham Way is open, all studied intersections except the intersection of 4th Avenue South and South Atlantic Street would operate at an acceptable level of service. The intersection of 4th Avenue South and South Atlantic Street would operate at LOS E or F. Further refinements would be required at this intersection.

Alternative B improves the total intersection delay measured across the six intersections being studied. The reduction of overall delay due to Alternative B, compared to the No Build Option, varies depending on the assumptions for South Royal Brougham Way and South Holgate Street.

Alternative A + B

Alternative A + B would improve operations at four intersections (out of six) along 1st Avenue South and 4th Avenue South. Even when both South Holgate Street and South Royal Brougham Way are closed, all intersections except 4th Avenue South and South Atlantic Street would operate at an acceptable level of service. The intersection of 4th Avenue South and South Atlantic Street would operate at LOS E or F. Further refinements would be required at this intersection.

Alternative A + B improves the total intersection delay measured across the six intersections being studied. The reduction of overall delay due to Alternative A + B, compared to the No Build Option, varies depending on the assumptions for South Royal Brougham Way and South Holgate Street.

South Royal Brougham Way Closure

South Royal Brougham Way provides much needed east-west capacity. With South Royal Brougham Way closed, the total delay across the six intersections increases. The increase of overall delay varies from one alternative to the other and depending on whether South Holgate Street is open or closed.

When South Holgate Street is open, increases of overall intersection delays due to South Royal Brougham Way closure are as follows:

- 58 percent for Alternative A.
- 27 percent for Alternative B.
- 40 percent for Alternative A + B.

When South Holgate Street is closed, increases of overall intersection delays due to South Royal Brougham Way closure are as follows:

- 36 percent for Alternative A.
- 34 percent for Alternative B.
- 40 percent for Alternative A + B.

South Holgate Street Closure

South Holgate Street also provides much needed east-west capacity in addition to the traffic management function it serves during major events. Closing South Holgate Street increases total delay across all six intersections. The increase of overall delay varies from one alternative to the other and depending on whether South Royal Brougham Way is open or closed.

When South Royal Brougham Way is open, increases of overall intersection delays due to South Holgate Street closure are as follows:

- 19 percent for Alternative A.
- 11 percent for Alternative B.
- 15 percent for Alternative A + B.

When South Royal Brougham Way is closed, increases of overall intersection delays due to South Holgate Street closure are as follows:

- 2 percent for Alternative A.
- 17 percent for Alternative B.
- 14 percent for Alternative A + B.

Key Level of Service Findings

The traffic modeling results indicate that under its existing configuration, the intersection of 4th Avenue South and South Atlantic Street operates at LOS E or F in all alternatives. This suggests that further analysis of SR 519 Phase 2 options should include an evaluation of additional improvements at this intersection.

Best intersection performances are obtained when both South Holgate Street and South Royal Brougham Way are open. The worst conditions occur when both streets are closed. With one east-west street closed and the other open at reduced capacity, the results indicate that the intersection performances are better with South Holgate Street closed and South Royal Brougham Way open.

Of all alternatives considered, Alternative A + B is the most effective long-term solution based on the intersection level of service for the year 2030 anticipated increase in traffic volumes.

The traffic analysis presented here is a preliminary evaluation of the alternatives supporting the feasibility assessment. Additional work will be required during subsequent phases of the project. The study area will be expanded further south to include South Holgate Street, South Lander Street and South Spokane Street. Different time periods should be studied including the morning peak, total daily traffic, and event conditions. Additional traffic analysis is assumed to be needed to support the continuing development and evaluation of intersection design and channelization.

Travel Times Analysis

In addition to intersection levels of service, some key trip times were used to evaluate the alternatives. Primary east-west and north-south trips were analyzed. For the east-west crossing, the travel times were computed between the Waterfront (at Terminal 46) and I-90. For the north-south crossing, the travel times were computed along 1st Avenue South between South Jackson Street and South Massachusetts Street. Both directions were analyzed in each case.

For this study, trip times were generated for selected primary travel routes by computing intersection approach delays, based on the intersection level of service analysis, and free-flow travel times, using distances and free flow speeds from the City model along a given route. Travel times are assumed to be representative of typical passenger car performance as they travel through the area during the evening peak period in 2030.

East-West Travel Times

East-west travel time results, in seconds, are shown graphically in Table 5-5.

East-west travel time results are consistent with the level of service results. All alternatives are shown to improve east-west crossing travel times when compared to the No Build Option. Reductions of east-west travel times vary depending on the alternatives and the assumptions for South Holgate Street and South Royal Brougham Way.

Alternative A improves the total east-west travel times from 12 percent to 33 percent depending on the assumptions for South Holgate Street and South Royal Brougham Way. Alternative B improves the total east-west travel times from 14 percent to 31 percent depending on the assumptions for South Holgate Street and South Royal Brougham Way. Alternative A + B improves the total east-west travel times from 19 percent to 38 percent depending on the assumptions for South Holgate Street and South Royal Brougham Way.

Alternative A + B produces better total east-west travel time performance, except with South Holgate Street closed and South Royal Brougham Way open. In this case, Alternative B is slightly better.

Overall, east-west travel time performances are better with both South Holgate Street and South Royal Brougham Way open.

Overall, east-west travel time performances are worse with both South Holgate Street and South Royal Brougham Way closed. Overall, east-west travel time performances are similar with either South Holgate Street or South Royal Brougham Way closed, although Alternative B and the No Build Option perform better with only South Holgate Street closed rather than only South Royal Brougham Way closed.

	South Holgate Street and South Royal Brougham Way Open at Reduced Capacity	South Holgate Street at Reduced Capacity, South Royal Brougham Way Closed	South Holgate Street Closed, South Royal Brougham Way at Reduced Capacity	South Holgate Street and South Royal Brougham Way both Closed
Alt A	115 305 420	122 379 501	151 366 517	144 461 605
Alt B	230 209 439	245 275 520	204 256 460	262 342 604
Alt A + B	125 229 354	174 293 467	173 303 476	184 354 538
No Build	201 311 512	284 468 752	217 373 590	283 540 823

WESTBOUND
EASTBOUND
TOTAL

Table 5-5 – 2030 Forecast Travel Times in Seconds
East-West Crossing

North-South Travel Times

North-South travel time results (measured along 1st Avenue South) are shown graphically in Table 5-6.

Alternative B improves the total travel times in the north-south direction (measured along 1st Avenue South) over the No-Build Option. When either South Holgate Street or South Royal Brougham Way is closed, Alternative A + B improves the total travel times in the north-south direction over the No Build Option. Alternative A appears to slightly increase the total north-south travel times compared to the No-Build Option. The southbound direction experiences higher travel times, especially for Alternative A and the No Build Option, when South Royal Brougham Way is closed.

	South Holgate Street and South Royal Brougham Way Open at Reduced Capacity	South Holgate Street at Reduced Capacity, South Royal Brougham Way Closed	South Holgate Street Closed, South Royal Brougham Way at Reduced Capacity	South Holgate Street and South Royal Brougham Way both Closed
Alt A	150 188 338	156 304 460	143 258 401	147 314 461
Alt B	150 120 270	167 136 303	182 145 327	162 127 289
Alt A + B	164 164 328	185 118 303	169 145 314	172 122 294
No Build	145 166 311	155 263 418	149 199 348	147 313 460

SOUTHBOUND
NORTHBOUND
TOTAL

Table 5-6 – 2030 Forecast Travel Times in Seconds
North-South Crossing

2030 No Build Option Traffic Analysis

Assumptions

- 2030 design year.
- Traffic analysis for evening peak period.
- Most recent AWV south end design (10C Concept).
- South Royal Brougham Way is either closed or open with reduced capacity due to increased rail activity.
- South Holgate Street is either closed or open with reduced capacity due to increased rail activity.
- Lander Street grade-separated.
- Intersection improvements at 1st Avenue South and South Atlantic Street include north-south dual left and east-west single left turn lanes.
- Signalized intersection at 1st Avenue South and South Massachusetts Street with north-south single left turn lanes.
- Current channelization at 4th Avenue South and South Atlantic Street.

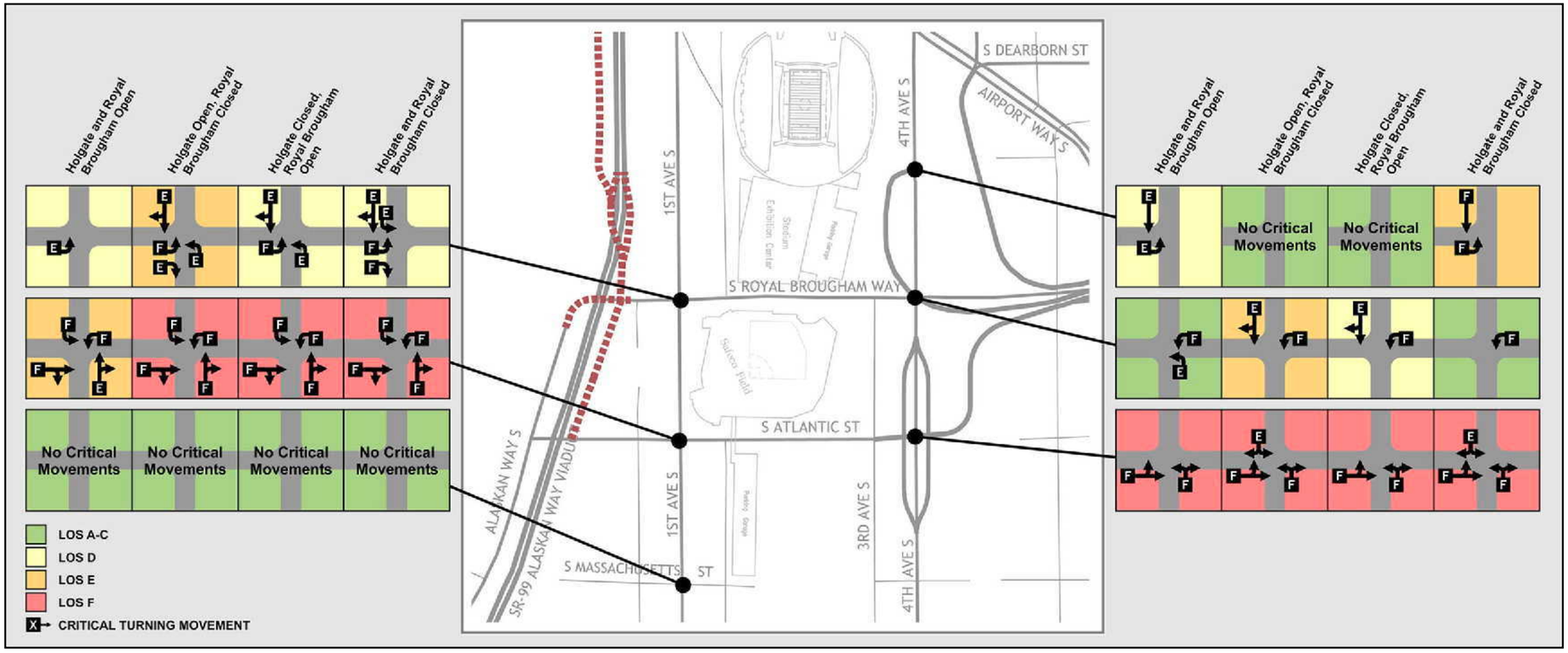
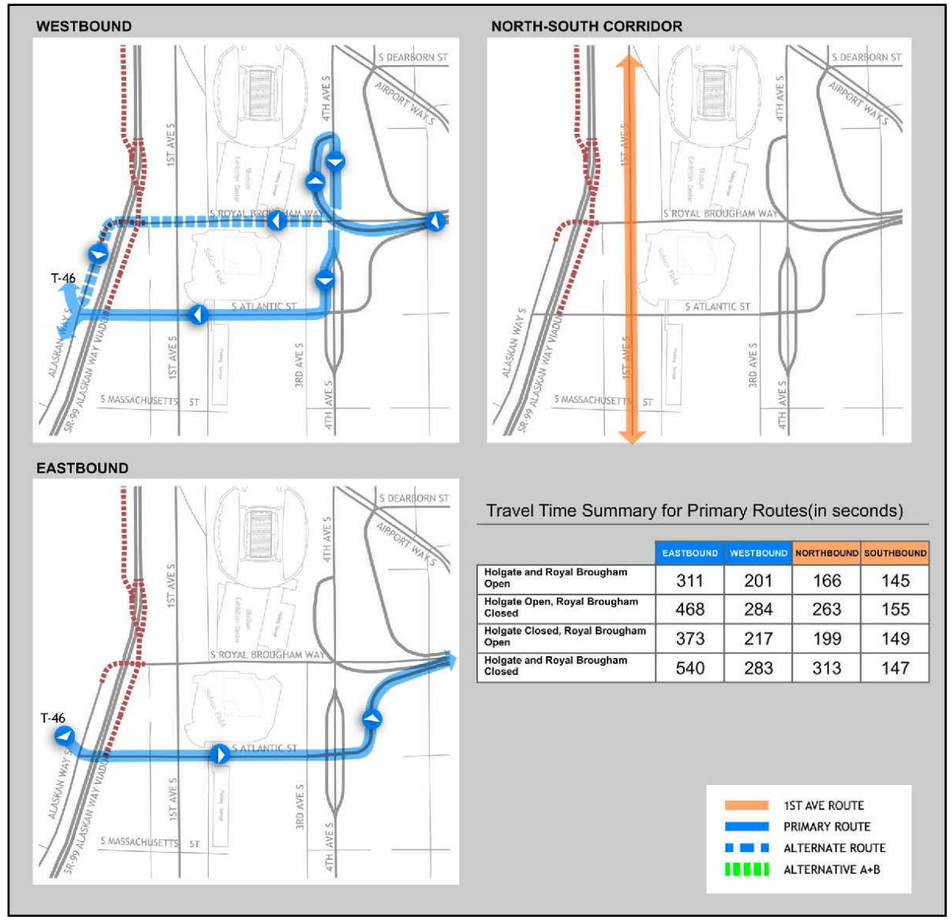


Figure 5-1: 2030 No Build Option – Level of Service Analysis – Critical Movements

NO BUILD OPTION TRAFFIC ANALYSIS FINDINGS

- Between two and four of the six intersections that were studied, would not operate at an acceptable level of service.
- The intersection of 4th Avenue South and South Atlantic Street would operate at LOS F under all assumptions for South Holgate Street and South Royal Brougham Way. The critical movements at this intersection are the northbound and eastbound approaches. A potential mitigation strategy would be to close the northbound left turn movement at that intersection, recognizing that the traffic would be redistributed at other intersections. This would allow the intersection to operate at an acceptable level of service when South Royal Brougham Way is open. Other mitigation strategies such as revising the existing intersection configuration and channelization could be considered as well.
- The intersection of 1st Avenue South and South Atlantic Street would operate at LOS E when both South Holgate Street and South Royal Brougham Way are open and LOS F in all other cases. Specific failing movements include the southbound and westbound left turns and the northbound and eastbound right/through movements. Further work would be needed to develop solutions for this intersection.
- East-west travel times are higher in the No Build Option than any other alternative.
- North-south travel times in the No Build Option are better or similar than those observed with Alternative A, but generally worse than those observed with Alternatives B and A + B.



Travel Time Summary for Primary Routes(in seconds)

	EASTBOUND	WESTBOUND	NORTHBOUND	SOUTHBOUND
Holgate and Royal Brougham Open	311	201	166	145
Holgate Open, Royal Brougham Closed	468	284	263	155
Holgate Closed, Royal Brougham Open	373	217	199	149
Holgate and Royal Brougham Closed	540	283	313	147

Figure 5-2: No Build Option – Routes/Travel Times

ALTERNATIVE A

Figure 5-3: Alternative A

Evaluation Criteria	Discussion
1-Purpose	Alternative A, including the improvements at South Atlantic Street and 1st Avenue South, meets the intent of this criterion for regional transportation, with the exception of intersections at 1st Avenue South and South Atlantic Street and 4th Avenue South and South Atlantic Street. Alternative A would improve rail operations for facilities in the area by directing westbound I-90 traffic away from the at-grade rail crossing at South Royal Brougham Way. Alternative A would improve the level of service for transportation access to facilities in the area by providing direct access for westbound freight traffic to the existing grade-separated rail crossing at South Atlantic Street. Alternative A improves total east-west travel times when compared to the No Build Option. The westbound movement primarily benefits from Alternative A.
2-Sensitivity	Alternative A would allow various development options to proceed in the SODO area and 'stadium district'.
3-Cost	This alternative could probably be constructed within the current project budget.
4-Flexibillity	Alternative A would not preclude additional development that increases access to the stadiums.
5-Phasing	This alternative is easy to implement.

Table 5-7 – Alternative A Evaluation

2030 Alternative A Traffic Analysis

Assumptions

- 2030 design year.
- Traffic analysis for evening peak period.
- Most recent AWV south end design (10C Concept).
- South Royal Brougham Way is either closed or open with reduced capacity due to increased rail activity.
- South Holgate Street is either closed or open with reduced capacity due to increased rail activity.
- Lander Street grade-separated.
- Intersection improvements at 1st Avenue South and South Atlantic Street include north-south dual left and east-west single left turn lanes.
- Signalized intersection at 1st Avenue South and South Massachusetts Street with north-south single left turn lanes.
- Intersection improvements at 4th Avenue South and South Atlantic Street include a third eastbound lane on South Atlantic west of the intersection.

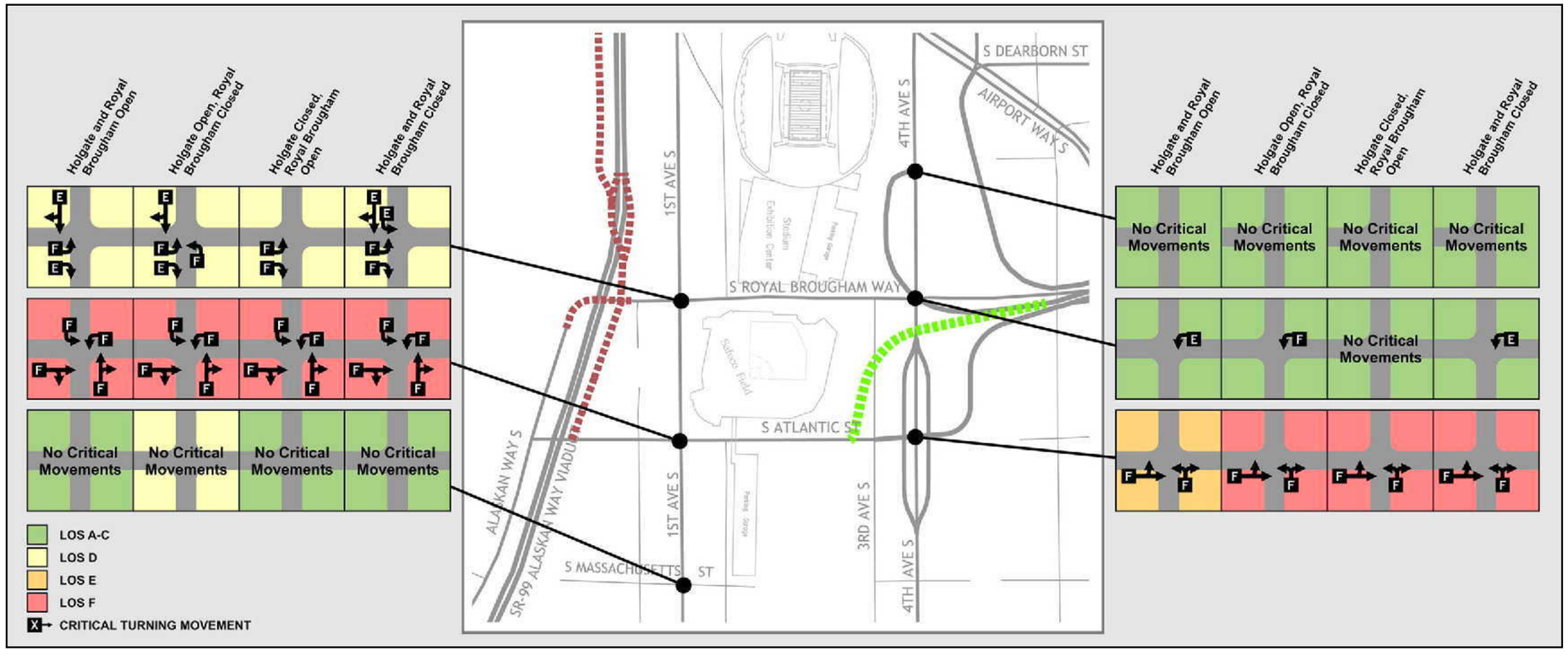
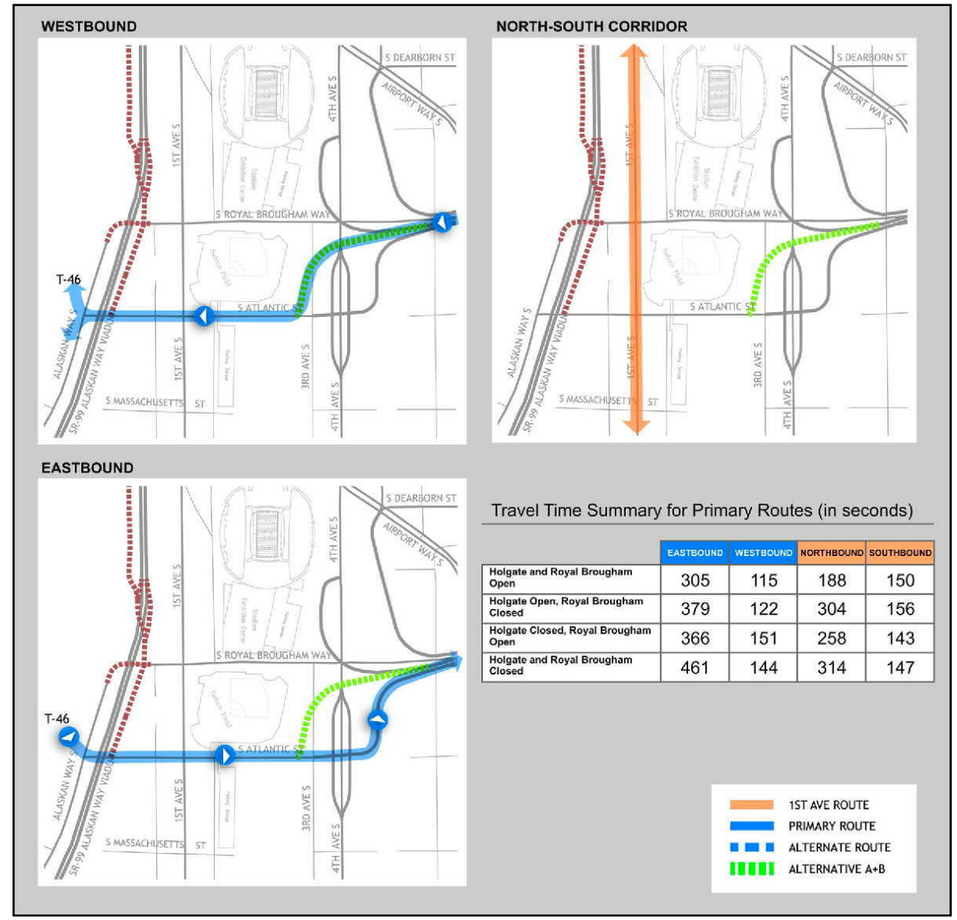


Figure 5-4: 2030 Alternative A – Level of Service Analysis – Critical Movements

ALTERNATIVE A TRAFFIC ANALYSIS FINDINGS

- Alternative A would improve the total intersection delay across the six intersections compared to the No Build Option.
- Alternative A would improve operations at the three intersections along 4th Avenue South over the No Build Option.
- The intersection of 1st Avenue South and South Royal Brougham Way would operate at LOS D under all assumptions of South Holgate Street and South Royal Brougham Way. However, some specific approaches would operate at LOS E or F, including the eastbound approach in all cases, and the southbound approach in most cases.
- Alternative A would reduce performance at 1st Avenue South and South Atlantic Street, which would operate at LOS F under all assumptions for South Holgate Street and South Royal Brougham Way. The four approaches to this intersection have specific movements that operate at LOS F. Intersection design or channelization refinements would have to be further explored.
- The intersection of 4th Avenue South and South Atlantic Street would improve but remain at LOS E when both South Holgate Street and South Royal Brougham Way are open, and LOS F in all other cases. The critical movements at this intersection are the northbound and eastbound approaches. A potential mitigation strategy would be to close the northbound left turn movement at that intersection, recognizing that the traffic would be redistributed at other intersections. This would allow the intersection of 4th Avenue South and South Atlantic Street to operate at an acceptable level of service. Other mitigation strategies such as revising the existing intersection configuration and channelization will be considered as well.
- Alternative A improves the total east-west travel times. Improvements range from 12 percent to 33 percent depending on the assumptions for South Holgate Street and South Royal Brougham Way.
- Alternative A appears to slightly increase the total north-south travel times (measured along 1st Avenue South) compared to the No Build Option.



Travel Time Summary for Primary Routes (in seconds)

	EASTBOUND	WESTBOUND	NORTHBOUND	SOUTHBOUND
Holgate and Royal Brougham Open	305	115	188	150
Holgate Open, Royal Brougham Closed	379	122	304	156
Holgate Closed, Royal Brougham Open	366	151	258	143
Holgate and Royal Brougham Closed	461	144	314	147

Figure 5-5: Alternative A – Routes/Travel Times

ALTERNATIVE B

Figure 5-6: Alternative B

Evaluation Criteria	Discussion
1-Purpose	Alternative B meets the intent of this criterion for regional transportation, with the exception of the intersection of 4th Avenue South and South Atlantic Street. Alternative B improves the overall intersection delay over the No Build Option and reduces total travel times for east-west crossings between I-90 and the Waterfront. By creating a couplet with South Atlantic Street, this alternative would improve freight mobility and connectivity to the waterfront. The eastbound movement primarily benefits from Alternative B. Alternative B also improves the total travel times in the north-south direction (along 1st Avenue South) over the No Build Option.
2-Sensitivity	Alternative B would allow various development options to proceed in the SODO area and 'stadium district'. Alternative B would assist the east-west traffic movement during construction of the AWV.
3-Cost	Alternative B could likely be constructed within the existing budget.
4-Flexibility	Alternative B would not preclude additional development to enable access to the athletic facilities.
5-Phasing	This alternative is easy to implement.

Table 5-8 – Alternative B Evaluation

2030 Alternative B Traffic Analysis

Assumptions

- 2030 design year.
- Traffic analysis for evening peak period.
- Most recent AWV south end design (10C Concept).
- Model assumes improved connection between South Massachusetts Street and SR 99 west of 1st Avenue South.
- South Royal Brougham Way is either closed or open with reduced capacity due to increased rail activity.
- South Holgate Street is either closed or open with reduced capacity due to increased rail activity.
- Lander Street grade-separated.
- Intersection improvements at 1st Avenue South and South Atlantic Street include north-south and east-west single left turn lanes.
- Signalized intersection at 1st Avenue South and South Massachusetts Street, with dual left turn lanes southbound and single left turn and right turn lanes northbound.
- Intersection improvements at 4th Avenue South and South Atlantic Street include a third eastbound lane on South Atlantic Street west of the intersection.

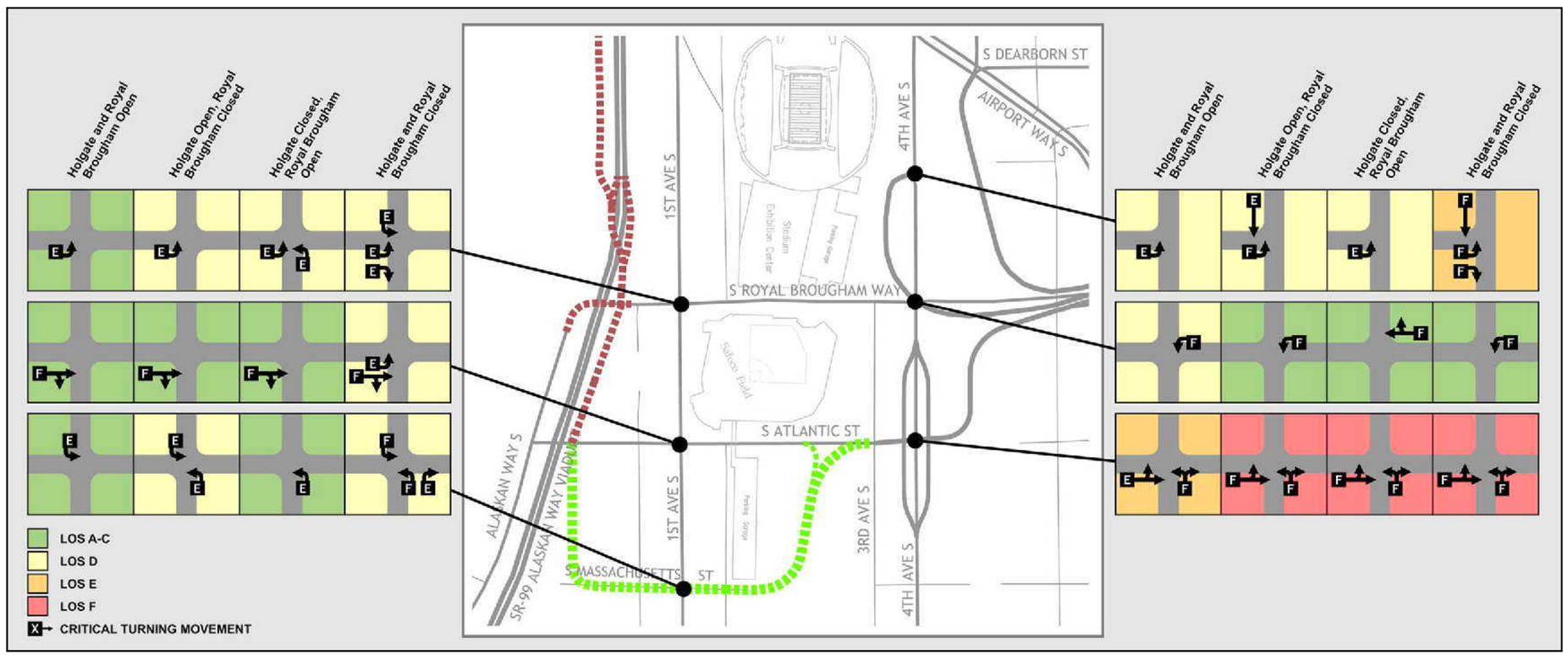
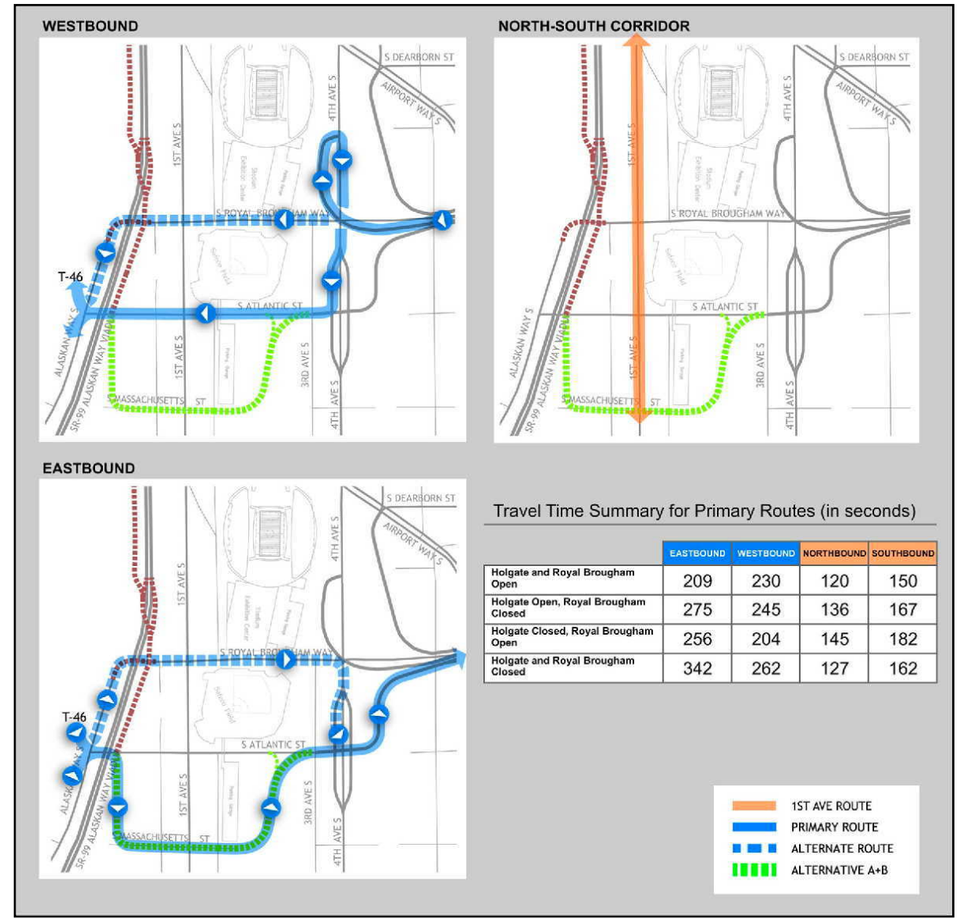


Figure 5-7: 2030 Alternative B – Level of Service Analysis – Critical Movements

ALTERNATIVE B TRAFFIC ANALYSIS FINDINGS

- Alternative B would improve the total intersection delay across the six intersections compared to the No Build Option.
- With either South Holgate Street or South Royal Brougham Way open, Alternative B would improve traffic performance to an acceptable level at all intersections except 4th Avenue South and South Atlantic Street.
- Alternative B would improve performance at four intersections (out of six) along 1st Avenue South and 4th Avenue South.
- Major operation improvements would be achieved at 1st Avenue South and South Atlantic Street, which would operate at an acceptable LOS (C or D) under all assumptions. The eastbound through and right turn movements would still be operating at LOS F.
- The intersection of 4th Avenue South and South Atlantic Street although improved would operate at LOS E when both South Holgate Street and South Royal Brougham Way are open and LOS F in all other cases. The critical movements at this intersection are the northbound and eastbound approaches. A potential mitigation strategy would be to close the northbound left turn movement at that intersection, recognizing that the traffic would be redistributed at other intersections. This will allow the intersection of 4th Avenue South and South Atlantic Street to operate at an acceptable level of service. Other mitigation strategies such as revising the existing intersection configuration and channelization will be considered as well.
- Alternative B improves the total east-west travel times. Improvements range from 14 percent to 31 percent depending on the assumptions for South Holgate Street and South Royal Brougham Way.
- Alternative B improves the total travel times in the north-south direction (measured along 1st Avenue South) over the No Build Option.



Travel Time Summary for Primary Routes (in seconds)

	EASTBOUND	WESTBOUND	NORTHBOUND	SOUTHBOUND
Holgate and Royal Brougham Open	209	230	120	150
Holgate Open, Royal Brougham Closed	275	245	136	167
Holgate Closed, Royal Brougham Open	256	204	145	182
Holgate and Royal Brougham Closed	342	262	127	162

Figure 5-8: Alternative B – Routes/Travel Times

ALTERNATIVE A + B

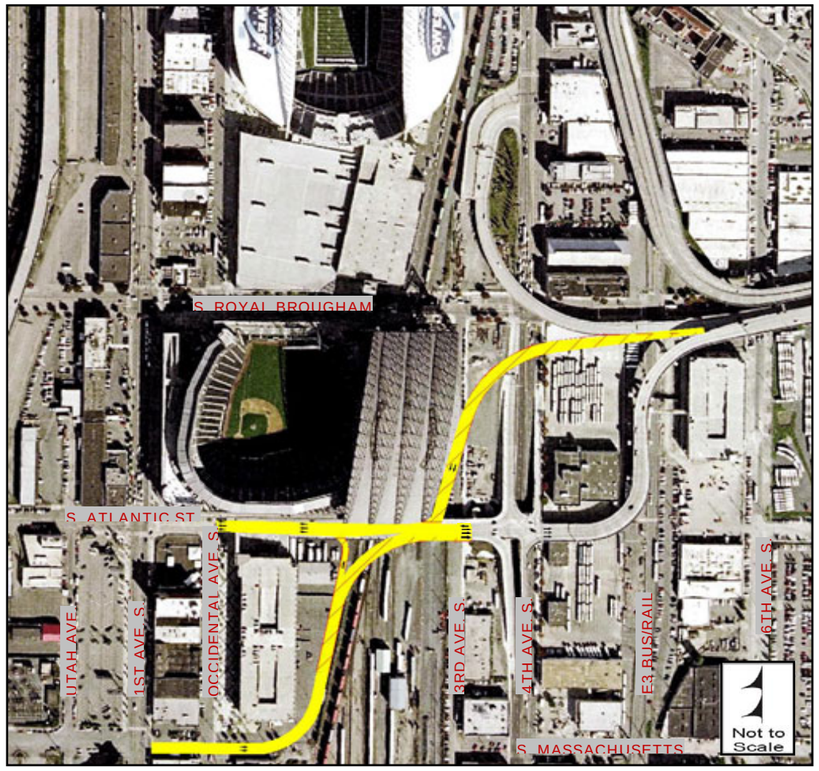


Figure 5-9: Alternative A + B

Evaluation Criteria	Discussion
1-Purpose	This alternative meets the intent of the regional transportation criteria. Alternative A + B would improve the rail operations for facilities in the area by elevating all westbound I-90 traffic over the railroad tracks. Alternative A + B would improve the level of service for transportation access to facilities in the area by providing direct access for westbound freight traffic to the existing grade-separated rail crossing at South Atlantic Street. In addition, eastbound traffic would be separated from South Massachusetts Street to South Atlantic Street. Alternative A + B improves total east-west travel times when compared to the No Build Option. Both the eastbound and westbound movements benefit from Alternative A + B.
2-Sensitivity	Alternative A + B would allow various development options to proceed in the SODO area and 'stadium district'.
3-Cost	Construction of this alternative would require additional funding, well in excess of the existing budget.
4-Flexibility	Alternative A + B would not preclude additional development to increase access to the stadiums
5-Phasing	This Alternative could be implemented in phases. Either the 'A' leg or the 'B' leg could be constructed first.

Table 5-9 – Alternative A + B Evaluation

2030 Alternative A + B Traffic Analysis

Assumptions

- 2030 design year.
- Traffic analysis for evening peak period.
- Most recent AWV south end design (10C Concept).
- Model assumes improved connection between South Massachusetts Street and SR 99 west of 1st Avenue South.
- South Royal Brougham Way is either closed or open with reduced capacity due to increased rail activity.
- South Holgate Street is either closed or open with reduced capacity due to increased rail activity.
- Lander Street grade-separated.
- Intersection improvements at 1st Avenue South and South Atlantic Street include north-south and east-west single left turn lanes.
- Signalized intersection at 1st Avenue South and South Massachusetts Street, with dual left turn lanes southbound and single left turn and right turn lanes northbound.
- Intersection improvements at 4th Avenue South and South Atlantic Street include a third eastbound lane on South Atlantic Street west of the intersection.

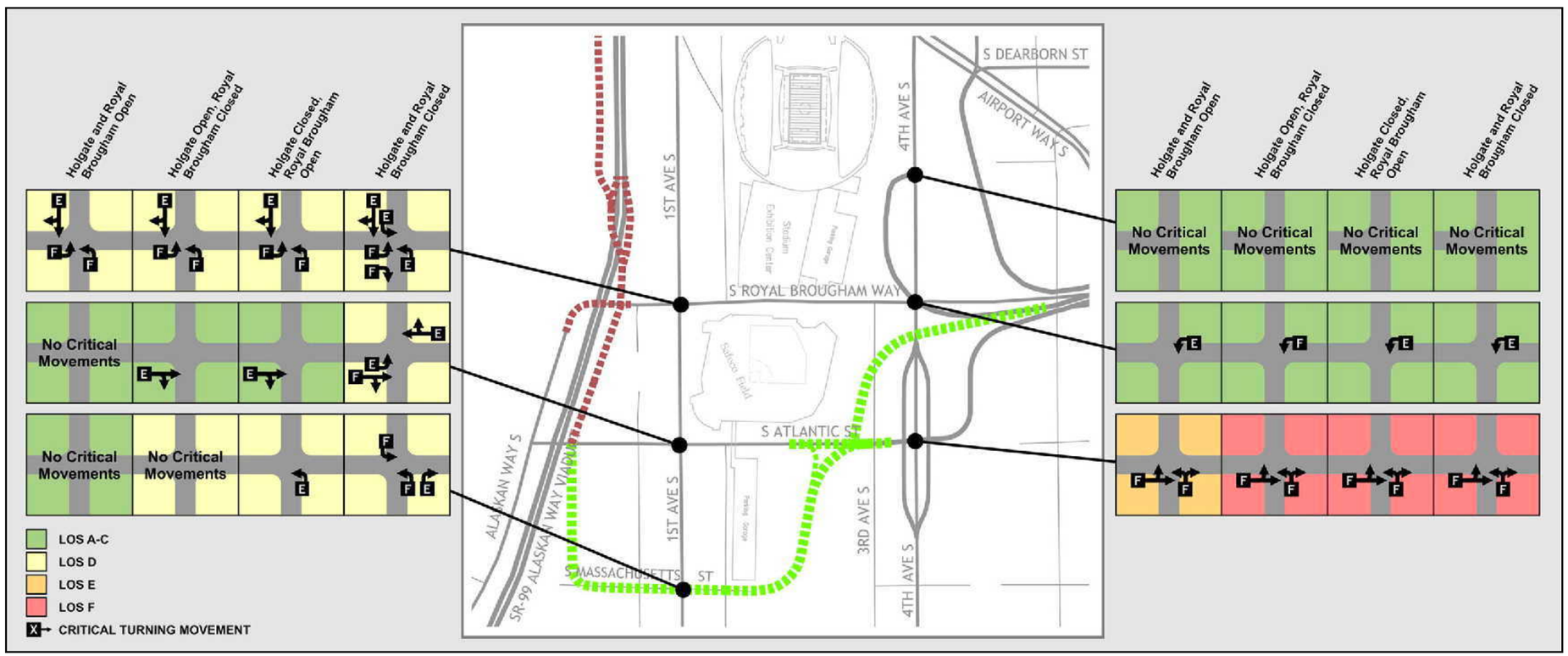
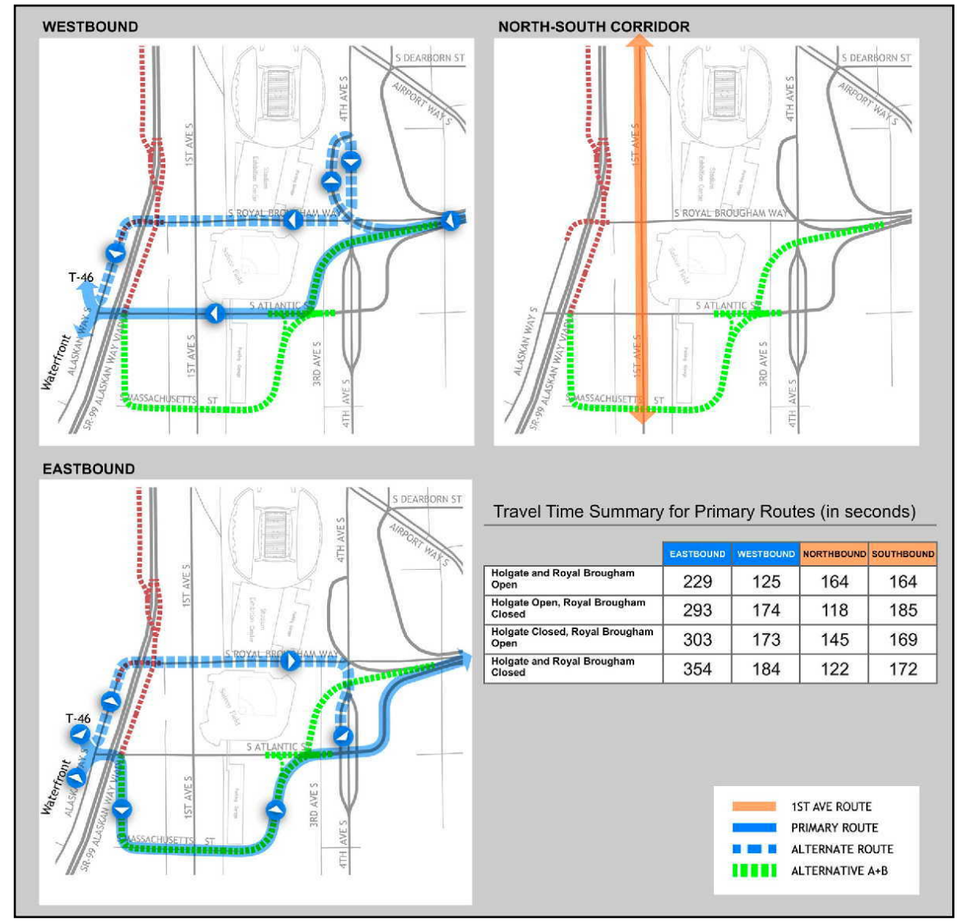


Figure 5-10: 2030 Alternative A + B – Level of Service Analysis – Critical Movements

ALTERNATIVE A + B TRAFFIC ANALYSIS FINDINGS

- Alternative A + B would improve the total intersection delay across the six intersections compared to the No Build Option.
- Alternative A + B would improve traffic performance to an acceptable level at all intersections except 4th Avenue South and South Atlantic Street.
- Alternative A + B would improve performance at four intersections (out of six) along 1st Avenue South and 4th Avenue South.
- Major operation improvements would be achieved at 1st Avenue South and South Atlantic Street, which would operate at an acceptable LOS (C or D) under all assumptions. Individual turning movements would still be problematic (LOS E or F) except when both South Holgate Street and South Royal Brougham Way are open.
- The intersection of 4th Avenue South and South Atlantic Street although improved would operate at LOS E when both South Holgate Street and South Royal Brougham Way are open and LOS F in all other cases. The critical movements at this intersection are the northbound and eastbound approaches. A potential mitigation strategy would be to close the northbound left turn movement at that intersection, recognizing that the traffic would be redistributed at other intersections. This would allow the intersection of 4th Avenue South and South Atlantic Street to operate at an acceptable level of service. Other mitigation strategies such as revising the existing intersection configuration and channelization will be considered as well.
- Alternative A + B improves the total east-west travel times. Improvements range from 19 percent to 38 percent depending on the assumptions for South Holgate Street and South Royal Brougham Way.
- Except when both South Holgate Street and South Royal Brougham Way are open, Alternative A + B improves the total travel times in the north-south direction over the No Build Option.



Travel Time Summary for Primary Routes (in seconds)

	EASTBOUND	WESTBOUND	NORTHBOUND	SOUTHBOUND
Holgate and Royal Brougham Open	229	125	164	164
Holgate Open, Royal Brougham Closed	293	174	118	185
Holgate Closed, Royal Brougham Open	303	173	145	169
Holgate and Royal Brougham Closed	354	184	122	172

Figure 5-11: Alternative A + B – Routes/Travel Times

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