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EXECUTIVE SUMMARY

This study evaluates intersection improvement alternatives at the SR 518 interchange with International Boulevard (SR 99) and South 154th Street in SeaTac, Washington (see Figure 1). Conditions were evaluated for the 2010 and 2030 PM peak hours using traffic volumes from the Sea-Tac Airport Comprehensive Development Plan (CDP). The analysis also considers the traffic impacts that would result with and without the potential high-density redevelopment of about 40 acres immediately northwest of the interchange area.

The Route Development Plan (RDP) process, prepared by Washington State Department of Transportation (WSDOT) in 2002, examined a number of long-range concepts for ramp revisions along SR 518. Among these alternatives were frontage road systems parallel to SR 518, and a single-point urban interchange (SPUI) at International Boulevard. The alternatives evaluated in this study provide additional options for the design of an upgraded interchange at this location.

Existing Conditions

An existing westbound off-ramp diverges with two lanes from the SR 518 collector-distributor road. One lane leads directly to a T-intersection with South 154th Street; the other lane loops around to merge with southbound International Boulevard. International Boulevard crosses South 154th Street with a signalized intersection about 400 feet east of the unsignalized T-intersection.

The T-intersection with South 154th Street has stop (left turn) and yield (right turn) control for ramp traffic, allowing uninterrupted east-west traffic flow on South 154th Street. The last 50 feet of the ramp approach widens to two lanes: a left-turn lane and a channelized right-turn lane. During the PM peak hour, the left-turn movement at the intersection operates at level of service (LOS) C. Vehicles turning right operate at LOS C due to the long queue of vehicles waiting for the signal at South 154th Street and International Boulevard. With the uninterrupted flow in the east-west direction, the overall intersection operates at LOS A.

The signalized intersection at International Boulevard and South 154th Street currently operates at LOS D during the PM peak hour. The S 154th St/32nd Ave S intersection and the International Blvd/SR 518 EB on-ramp intersection both operate at LOS A during the PM peak hour.
SR 518 Interchange at International Boulevard / South 154th Street

Interchange Alternatives Analysis

Alternative 1a (Existing)

Alternative 2b

Alternative 1c

Alternative 2e

Legend

--- Active Roadway
--- Vacated Roadway
○ Signalized Intersection
○ Unsignalized Intersection
→ Traffic Lanes

Figure 1
International Blvd / S 154th St Interchange Alternatives
Programmed Improvements

The Sea-Tac Airport CDP includes a consolidated rental car facility that would increase the volume of traffic using the loop ramp from SR 518. The mitigation for this traffic increase is the addition of a third southbound lane to International Boulevard beginning at South 154th Street and ending at the proposed rental car facility at South 160th Street.

Sound Transit is building a light rail station near the intersection of International Boulevard and South 154th Street. Mitigation includes changing the lane channelization to eliminate separate signal phases for eastbound and westbound movements. The new eastbound channelization will be two left-turn lanes, two through lanes, and one right-turn lane. New westbound channelization will be two left-turn lanes, one through lane, and one through/right shared lane.

Potential Residential Redevelopment

The City of SeaTac is considering rezoning in the vicinity of the light rail station. The area for this rezone is roughly bounded by SR 518 on the south, International Boulevard on the east, South 152nd and South 150th Streets on the north, and 29th Avenue South on the west.

Alternatives Evaluation

Six interchange reconfiguration alternatives were developed to handle projected traffic volumes. Three reconfiguration alternatives were selected for detailed evaluation (see Figure 1).

Alternative 1a is the existing interchange configuration with the programmed improvements and without potential residential redevelopment. This alternative is included only for comparison purposes.

Alternative 1c would add a westbound SR 518 to northbound International Boulevard off-ramp and eliminate the existing ramp connection to South 154th Street.

Alternative 2b would add a westbound SR 518 off-ramp that connects to International Boulevard with a T intersection. The existing westbound off-ramps would be removed.

Alternative 2e would add a westbound SR 518 to northbound International Boulevard off-ramp, remove the existing ramp connection to South 154th Street, and add a new ramp connection to South 154th Street at 32nd Avenue South.

The intersections in each alternative were evaluated using projected traffic volumes for 2010 and 2030 PM peak hour traffic conditions both without and with potential residential redevelopment. Current cycle lengths were maintained for signalized intersections, but phasing was altered in response to changing traffic patterns. All signalized intersections were assumed to be interconnected and coordinated.

Alternatives 1a, 1c, and 2e would include a third southbound lane on International Boulevard beginning at the loop ramp and continuing to South 160th Street. In Alternative 2b, the third southbound lane on International Boulevard would begin at South 154th Street. Alternatives 2b
and 2e include a northbound auxiliary lane on International Boulevard beginning at the new westbound SR 518 off-ramp and ending at the existing right-turn pocket at South 154th Street.

2010 Intersection Operations

The 2010 analysis evaluates the operation of the three reconfiguration alternatives and Alternative 1a using traffic volumes forecast in the *Surface Transportation Discipline Report* prepared for the Sea-Tac CDP (September, 2006). The extension of SR 509 was not included in the traffic forecasts. The anticipated 2010 intersection levels of service are shown in Table 1 for the overall intersection (signalized locations) or the minor approach (unsignalized locations).

Table 1

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Alternative 1a</th>
<th>Alternative 1c</th>
<th>Alternative 2b</th>
<th>Alternative 2e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without Redevelopment</td>
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<td></td>
</tr>
<tr>
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<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>International Blvd / SR 518 EB On-ramp</td>
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<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>International Blvd / New SR 518 WB Off-ramp</td>
<td>-</td>
<td>B</td>
<td>B</td>
<td>B</td>
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<tr>
<td>S 154th St / 32nd Ave S (New SR 518 WB Off-ramp)</td>
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</tr>
<tr>
<td>S 154th St / SR 518 WB Off-ramp</td>
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<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>With Redevelopment</td>
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<td></td>
<td></td>
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<tr>
<td>International Blvd / S 154th St</td>
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<td>C</td>
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<td>C</td>
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<tr>
<td>International Blvd / SR 518 EB On-ramp</td>
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<tr>
<td>International Blvd / New SR 518 WB Off-ramp</td>
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<td>B</td>
<td>B</td>
</tr>
<tr>
<td>S 154th St / 32nd Ave S (New SR 518 WB Off-ramp)</td>
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<td>B</td>
<td>B</td>
<td>B</td>
</tr>
</tbody>
</table>

Note: 1 Concept 2e includes new SR 518 westbound off-ramp to S 154th St at 32nd Ave S - Intersection is not applicable for this concept

Source: HNTB, 2006

2030 Intersection Operations

The 2030 analysis again uses traffic volumes from the *Surface Transportation Discipline Report*. Traffic volumes from the SR 509 extension were included in all three reconfiguration alternatives. Anticipated 2030 intersection operations are shown in Table 2 both without and with the potential residential development.
### Table 2
2030 Intersection Levels of Service

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Alternative 1c</th>
<th>Alternative 2b</th>
<th>Alternative 2e</th>
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<td>C</td>
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<tr>
<td>International Blvd / SR 518 EB On-ramp</td>
<td>A</td>
<td>B</td>
<td>A</td>
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<tr>
<td>International Blvd / New SR 518 WB Off-ramp</td>
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<td>B</td>
<td>B</td>
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<tr>
<td>S 154th St / 32nd Ave S (New SR 518 WB Off-ramp)</td>
<td>B</td>
<td>B</td>
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<tr>
<td><strong>With Redevelopment</strong></td>
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<td></td>
</tr>
<tr>
<td>International Blvd / S 154th St</td>
<td>D</td>
<td>D</td>
<td>C</td>
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<tr>
<td>International Blvd / SR 518 EB On-ramp</td>
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<tr>
<td>International Blvd / New SR 518 WB Off-ramp</td>
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<td>B</td>
<td>B</td>
</tr>
<tr>
<td>S 154th St / 32nd Ave S (New SR 518 WB Off-ramp)</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
</tbody>
</table>

Note:
1. Concept 2e includes new SR 518 westbound off-ramp to S 154th St at 32nd Ave S
2. Intersection is not applicable for this concept

Source: HNTB, 2006

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**Recommendation**

Alternative 2e is recommended for advancement into the permitting, impact assessment, and preliminary engineering stages of project development. This alternative would provide the new exit ramp from westbound SR 518 to International Boulevard and retain the loop ramp and direct ramp connection to South 154th Street. Only right turns would be permitted from the new ramp, eliminating the need for signalization and minimizing the impact of queues from adjacent intersections.

With the implementation of Alternative 2e, an eastbound left-turn lane is recommended on South 154th Street at the 32nd Avenue south intersection.
EXISTING CONDITIONS

The interchange currently serves westbound SR 518 traffic exiting to International Boulevard and to South 154th Street. An unsignalized intersection at South 154th Street serves traffic exiting SR 518 to northbound International Boulevard (SR 99) and adjacent residential and commercial areas along South 154th Street. Motorists destined southbound on International Boulevard are provided with a loop ramp exit from westbound SR 518. The loop ramp, South 154th Street ramp, and North Airport Expressway exits all originate from a common collector-distributor road system along westbound SR 518.

The intersection of South 154th Street with the SR 518 westbound off-ramp consists of a T-intersection with the ramp as the south leg. It operates under Stop control, with east-west traffic uninterrupted. The ramp is located about 400 feet west of the signalized International Boulevard/South 154th Street intersection. South 154th Street is designated as a minor arterial street with a 35 mph posted speed, and provides two lanes, with additional auxiliary lanes in the vicinity of International Boulevard. International Boulevard is a north-south principal arterial street with a 40 mph posted speed, consisting of five lanes in the project vicinity.

The westbound exit ramp from the SR 518 collector distributor road consists of two lanes, originating as a drop lane and optional lane from the collector-distributor road. The loop ramp to southbound International Boulevard drops a lane, leaving one lane on the ramp connecting to South 154th Street. At the intersection with South 154th Street, the south approach provides a left-turn lane to reach westbound South 154th Street, and a channelized right-turn lane to eastbound South 154th Street. Over its total length of about 250 feet, two lanes are provided only in the northernmost 50 feet in advance of the channelized right turn.

During the existing PM peak hour, about 40 vehicles make a left turn from the ramp, and about 240 vehicles make the right turn. Of the total ramp volume of 285 vehicles per hour (vph), about 86 percent turn right. Many of the vehicles making the right turn are destined to make a left turn at the International Boulevard/South 154th Street intersection. Three approach lanes are provided on the west leg of this intersection: an exclusive left, and shared left/through, and an exclusive right. In addition, many eastbound vehicles on South 154th Street are destined to the right-turn lane on this leg.

The existing ramp terminal intersection operates at level of service (LOS) C for vehicles making the left-turn movement onto westbound South 154th Street, with an average delay per vehicle of 22.6 seconds. The right-turn movement operates at LOS C, with an average delay of 21.4 seconds. The east-west through movement flows uninterrupted. The International Boulevard/South 154th Street intersection currently operates at LOS D with 44.7 seconds of delay per vehicle during the PM peak hour.

PROGRAMMED IMPROVEMENTS

The Sea-Tac Airport CDP included a consolidated facility for rental car operations. Part of the mitigation for this facility was adding a third southbound lane to International Boulevard at South 154th Street. The rental car facility would also increase the volume of traffic using the loop ramp from SR 518, returning to the airport.
Sound Transit’s Tukwila International Boulevard light rail station is being built near the intersection of International Boulevard at South 154th Street. Mitigation for this station included changing the lane channelization at International Boulevard and South 154th Street to eliminate the split signal phases for the eastbound and westbound legs of this intersection. The channelization that will be used includes two eastbound left-turn lanes, two eastbound through lanes, one eastbound right-turn lane, two westbound left-turn lanes, one westbound through lane and a westbound through/right shared lane.

**ALTERNATIVES DESCRIPTION**

Six alternatives were screened, resulting in three alternatives selected for detailed evaluation. These alternatives are 1c, 2b and 2e. Alternative 1a is included only for comparison purposes.

- **Alternative 1a**: This alternative is the existing interchange configuration with the programmed improvements, but without the potential residential redevelopment.

- **Alternative 1c**: This alternative would include a new diamond-type ramp exiting westbound SR 518 at International Boulevard, but would permit only right turns from this new ramp. Ramp traffic would operate under Stop control. The loop ramp to southbound International Boulevard would remain and the ramp to South 154th Street would be eliminated.

- **Alternative 2b**: This alternative would remove the existing westbound ramps to southbound SR 99 and to South 154th Street and replace them on the east side of International Boulevard with a conventional diamond-type ramp. Right and left turns would be permitted at a new signalized intersection on International Boulevard.

- **Alternative 2e**: This alternative would include a new diamond-type ramp exiting westbound SR 518 at International Boulevard, but would permit only right turns from this new ramp. Ramp traffic would operate under Stop control. The loop ramp to southbound International Boulevard would remain, and a ramp to South 154th Street at 32nd Avenue South would be included.

Schematic diagrams of all the alternatives are presented in Figure 1. Diagrams of Alternatives 1c, 2b, and 2e are appended at the end of this document.

The interchange alternatives were evaluated using intersection capacity analysis procedures with projected 2010 traffic demands. Impacts associated with the Sea-Tac Airport Comprehensive Development Plan are included. Baseline 2010 and 2030 PM peak hour conditions were evaluated for each alternative. In addition, a second scenario was assessed with redevelopment of the areas bounded by International Boulevard, South 154th Street, 32nd Avenue South, and South 150th Street. This area would be developed at higher densities to reflect its proximity to the Tukwila International Boulevard light rail station. Peak-hour vehicle use for the redevelopment properties would be influenced by a higher level of transit usage, and improved walk/bike access to adjacent commercial and employment areas.

Redevelopment for residential uses would potentially provide an additional 320 dwelling units on 30 acres of developable land. Similar projects to provide transit-oriented development in the
region indicate trip-making could be reduced by about 30 percent relative to typical rates in communities poorly served by transit. Vehicle trip generation for this project would reach about 175 trip ends in the PM peak hour, with about 85 vehicles entering, and 60 vehicles exiting the site. About 50 percent of these trips would be oriented to and from the east on SR 518.

Intersection operations for PM peak hour conditions were evaluated using the Synchro software for intersection capacity analysis. The analysis covers the portions of International Boulevard from South 154th Street to the existing on-ramp to eastbound SR 518, and South 154th Street in the vicinity of the ramp terminal. For signalized operations, signal cycle lengths were held near their present value of 100 seconds, but green splits and phasing were altered in response to changing traffic patterns. All signalized intersections would be interconnected and coordinated, with several potentially operating at half-cycle lengths. In Alternatives 1c and 2b, progression was oriented along South 154th Street. In Alternative 2e, progression was focused on International Boulevard.

INTERSECTION OPERATIONS (2010)

Traffic volumes were redistributed to reflect changes in the ramp geometry for each alternative. All alternatives include a third southbound lane on International Boulevard originating at the loop ramp and continuing to the proposed rental car facility at S 160th St. In Alternative 2b, where the loop ramp is not present, the third southbound lane on International Boulevard originates at South 154th Street. Alternatives 2b and 2e include a northbound auxiliary lane on International Boulevard originating at the new westbound ramp to connect to the existing right-turn pocket at South 154th Street. Intersection operations for 2010 are summarized in Table 3.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>SR 518 WB Off-Ramp &amp; S 154th St</th>
<th>32nd Ave S¹ &amp; S 154th St</th>
<th>International Blvd &amp; S 154th St</th>
<th>International Blvd &amp; New SR 518 WB Off-Ramp</th>
<th>International Blvd &amp; SR 518 EB On-Ramp</th>
</tr>
</thead>
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<td>2e</td>
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<td>-</td>
<td>14.1</td>
<td>B</td>
<td>28.6</td>
</tr>
</tbody>
</table>

Note: ¹ Concept 2e includes new SR 518 westbound off-ramp to S 154th St at 32nd Ave S
       - Intersection is not applicable for this concept

Source: HNTB, 2006
Alternative 1c

This alternative would provide a new ramp connection to International Boulevard to serve vehicles exiting westbound SR 518 destined northbound on International Boulevard and destined for South 154th Street. It would operate at LOS B for traffic on the ramp approach. The maximum queue length, reported as the 95th percentile queue in SimTraffic, on the new ramp would extend about 1,300 feet.

Operations at the International Boulevard/South 154th Street intersection would remain at LOS C in this alternative, with an average delay of 28 seconds per vehicle in the PM peak hour. Additional traffic would approach from the south, reflecting the loss of the direct ramp to South 154th Street. A weaving movement would be introduced on northbound International Boulevard by traffic destined to westbound South 154th Street. Maximum queue length for the northbound left turn would extend about 160 feet.

The International Boulevard/EB SR 518 on-ramp intersection would experience LOS A with about 7.3 seconds of delay per vehicle in the 2010 PM peak hour, with a single southbound left-turn lane. Maximum queue length would reach about 330 feet.

A signalized intersection on South 154th Street at 32nd Avenue South would operate at LOS A with about 6 seconds of delay during the 2010 PM peak. This alternative would not include a ramp connection at this intersection.

Alternative 2b

This alternative would provide a new ramp connection to International Boulevard from SR 518, with a signalized intersection to serve exiting movements from westbound SR 518. The new intersection would provide two left-turn lanes and a single right-turn lane. It would operate at LOS B with about 11 seconds of delay per vehicle in the 2010 PM peak hour. Maximum queues on the ramp would extend about 190 feet.

Operations at the International Boulevard/South 154th Street intersection would remain at LOS C in this alternative, with average delay increasing to 31 seconds per vehicle in the PM peak hour. Additional traffic would approach from the south, reflecting the loss of the direct ramp to South 154th Street. A weaving movement would be introduced on northbound International Boulevard by traffic destined to westbound South 154th Street. Maximum queue length for the northbound left turn would extend about 390 feet. The eastbound approach would experience less traffic as a result of the revised ramp geometrics, and queues would be reduced to 160 feet in length.

The International Boulevard/EB SR 518 on-ramp intersection would experience LOS A with about 6.6 seconds of delay per vehicle in the 2010 PM peak hour, with a single southbound left-turn lane. Maximum queue length would reach about 330 feet.

A signalized intersection on South 154th Street at 32nd Avenue South would operate at LOS A with about 10 seconds of delay during the 2010 PM peak. This alternative would include no ramp connection at this intersection.
Alternative 2e

This alternative would provide the new diamond-type ramp connecting to International Boulevard, but would permit only right turns onto northbound International Boulevard at the ramp terminus. The loop ramp and a direct ramp connection to South 154th Street would be retained. The new ramp terminal intersection would operate at LOS B with the ramp approach under Stop control.

The International Boulevard/South 154th Street intersection would operate at LOS C with about 28 seconds of average delay in the 2010 PM peak hour. Maximum queues of eastbound traffic would extend about 230 feet, and 160 feet for the northbound left turn.

At the International Boulevard intersection with the EB SR 518 on-ramp, operations would remain at LOS A with about 5 seconds of average delay. Maximum queues for the southbound left turn would reach 260 feet.

The South 154th Street/32nd Avenue South intersection would operate at LOS B with about 11 seconds of average delay.

Residential Redevelopment

With redevelopment, the International Boulevard/South 154th Street intersection would experience an increase in entering traffic volumes of about 110 vph in all alternatives. The resulting operations at this intersection would remain at LOS C during the 2010 PM peak hour for Alternatives 1c and 2e. Average delays would increase by 1 to 2 seconds with the added volume.

The signalized ramp terminal intersection at South 154th Street in Alternative 2e would operate at LOS B. Redevelopment traffic would add about 50 vph to this intersection in the 2010 PM peak hour. Average delays would increase by 3 seconds per vehicle.

A new off-ramp connection to International Boulevard would operate at LOS B in a signalized configuration in Alternative 2b. Redevelopment traffic would add 40 vph to the right-turn volumes in the 2010 PM peak hour. Maximum ramp queues would extend about 210 feet in Alternative 2b.

The existing International Boulevard/SR 518 eastbound on-ramp intersection would operate at LOS A in all alternatives, but redevelopment traffic would result in longer queues for the southbound left turn. Maximum queue length in a single lane would reach 350 feet for this movement in Alternative 2b, 300 feet in Alternative 1c and 260 feet in Alternative 2e. Storage capacity could be exceeded during the 2010 PM peak hour with Alternative 2b; this condition could result in blockages of the westbound left turn at the new ramp terminal on International Boulevard.

INTERSECTION OPERATIONS (2030)

The 2030 analysis considers the performance of the three alternative concepts at the level of 45 million annual passengers at Sea-Tac Airport. Completion of the SR 509 extension was included in all the 2030 scenarios, and appeared to affect traffic volumes on both International Boulevard
and South 154th Street compared to 2010 conditions without this project. Intersection operations for 2030 are summarized in Table 4.

### Table 4

#### 2030 Alternatives Analysis

<table>
<thead>
<tr>
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</table>

Note:  
- Concept 2e includes new SR 518 westbound off-ramp to S 154th St at 32nd Ave S
- Intersection is not applicable for this concept

Source: HNTB, 2006

**Alternative 1c**

This alternative would retain the loop ramp with a new off-ramp connection to serve traffic turning north on International Boulevard. It would operate at LOS C for traffic on the ramp approach. Maximum queues on the new off-ramp would reach about 1,700 feet, exceeding the length of the ramp and extending onto the westbound collector-distributor roadway.

At the International Boulevard/South 154th Street intersection, 2030 PM peak hour volumes would produce LOS D with about 36 seconds of average delay. Maximum queues of eastbound traffic would reach 190 feet, potentially blocking the South 154th Street/32nd Avenue South intersection. Queues of northbound left-turn traffic would extend about 140 feet.

The International Boulevard/EB SR 518 on-ramp intersection would operate at LOS A with about 6 seconds of average delay. Maximum queues for the southbound left turn would reach 340 feet.

The South 154th Street/32nd Avenue South intersection would operate at LOS B with about 12 seconds of average delay per vehicle during the 2030 PM peak hour.

**Alternative 2b**

This alternative would provide a new diamond-type off-ramp from westbound SR 518 connecting to International Boulevard and would remove the existing loop ramp and South 154th Street ramp.
The new ramp terminal intersection would operate at LOS B with about 18 seconds of delay. Maximum queues on this ramp would reach about 560 feet in length.

The International Boulevard/South 154th Street intersection would continue to operate at LOS C in the alternative, with about 32 seconds of delay per vehicle in the 2030 PM peak hour. Maximum queues of eastbound traffic would extend about 190 feet, well short of the 32nd Avenue South intersection. Queues of northbound left-turn traffic, however, would reach about 420 feet.

The International Boulevard/EB SR 518 on-ramp intersection would operate at LOS B with about 11 seconds of average delay. Queues for the southbound left-turn lane would extend about 430 feet in the single left-turn lane provided in this alternative. Queues from the southbound left turn lane would potentially block the SR 518 westbound off-ramp intersection during 10 percent of 2030 PM peak hour traffic signal cycles.

A signalized intersection along South 154th Street at 32nd Avenue South would operate at LOS B with about 10.4 seconds of average delay. No ramp connections would be provided at this location in this alternative.

**Alternative 2e**

This alternative would retain the loop ramp and direct ramp connection to South 154th Street, with a new off-ramp connection to serve traffic turning north on International Boulevard. It would operate at LOS B and maximum queues on the new off-ramp would reach about 1,100 feet with Stop control at the ramp terminal. The 95th-percentile queues would remain on the ramp proper.

At the International Boulevard/South 154th Street intersection, 2030 PM peak hour volumes would produce LOS C with about 31 seconds of average delay. Maximum queues of eastbound traffic would reach 190 feet. Queues of northbound left-turn traffic would be reduced to about 160 feet.

The International Boulevard/EB SR 518 on-ramp intersection would operate at LOS A with about 6 seconds of average delay. Maximum queues for the southbound left turn would reach 330 feet.

The South 154th Street/32nd Avenue South intersection would operate at LOS B with about 15 seconds of average delay per vehicle during the 2030 PM peak hour.

**Residential Redevelopment**

With redevelopment in 2030, traffic operations at the International Boulevard/South 154th Street intersection would deteriorate to LOS D in Alternatives 1c and 2b and would remain at LOS C in Alternative 2e. Signal timing and phasing revisions in response to the new traffic patterns would allow delays to remain between 32 and 49 seconds per vehicle.

Queues of northbound traffic would increase to 370 feet in Alternative 2b, potentially blocking the new westbound SR 518 off-ramp along International Boulevard.

The intersection at South 154th Street/32nd Ave would operate at LOS B in a signalized condition for all alternatives. Average delay per vehicle would increase about 1 second in all alternatives. Alternative 2e would experience the most delay, with 16 seconds per vehicle.
The intersection on International Boulevard with the eastbound SR 518 on-ramp would remain at
the same LOS in all alternatives, compared to conditions without redevelopment. The largest
increase in delay would be about 1.5 seconds in Alternative 2b, compared to conditions without
redevelopment. Queues of southbound left-turn traffic would extend 330 feet in Alternative 1c,
390 feet in Alternative 2e and 410 feet in Alternative 2b. Alternatives 2e and 2b would exceed
the storage capacity of 350 feet by two to three car lengths.

DISCUSSION

Alternative 1c would provide the new exit ramp from westbound SR 518 to International
Boulevard, and retain the loop ramp; because the direct ramp connection to South 154th Street is
lost, operations at the intersection of International Boulevard/South 154th Street would deteriorate
to LOS D and the average delay per vehicle would be higher than either of the other alternatives.
Queues of northbound left-turn traffic at this intersection would exceed the available storage
capacity.

In Alternative 2b, traffic destined north on International Boulevard would be provided with a
direct route from westbound SR 518, and the route to South 154th Street would be made more
circuitous. It would adversely affect operations at the International Boulevard/South 154th Street
intersection, which deteriorates to LOS D with redevelopment traffic included. By 2030, queues
of northbound traffic along International Boulevard at South 154th Street would block the new
ramp terminal intersection.

Alternative 2e would provide the new exit ramp from westbound SR 518 to International
Boulevard and retain the loop ramp and direct ramp connection to South 154th Street. Only right
turns would be permitted from the new ramp, eliminating the need for signalization and
minimizing the impact of queues from adjacent intersections. This alternative is judged to be
superior for this reason. Ramp movements would operate under Stop control to reduce weaving
conflicts along northbound International Blvd. Vehicular queues on the ramp would extend to
about 1,100 feet in the design year, but remain on the ramp proper.

A new ramp terminal on SR 99 would be subject to WSDOT’s access control guidelines for
limited access facilities. No adjacent intersection or driveway access currently exists within the
300-foot guideline.

A new ramp terminal on South 154th Street also would be subject to WSDOT’s access control
guidelines for limited access facilities. The design criteria require that limited access be extended
a minimum of 300 feet in both directions along South 154th Street from the ramp, and cover both
sides of the street. With a ramp terminal at 32nd Avenue South, access to two apartment
complexes and the Post Office would be affected. Driveways along 32nd Avenue South also could
be affected. WSDOT would be seeking an access design that limits left turns into and out of these
driveways using a raised median. With implementation of Alternative 2e, an eastbound left-turn
lane would be recommended on South 154th Street at the 32nd Avenue South intersection.

All alternatives would operate with satisfactory level of service at the SR 99 intersection with the
eastbound SR 518 on-ramp, but queues for the southbound left-turn movement would exceed the
available storage bay length by as much as 80 feet during the design year PM peak hour. This
condition could be addressed with a second southbound left-turn lane. The consequences of this
action would include reconstruction of the on-ramp to accept two lanes, and the loss of a southbound through lane. Instead, it is recommended that the single southbound left-turn lane be retained, given the slight deficit of storage capacity. If additional density of redevelopment is contemplated relative to the analysis condition, this recommendation could be revisited in the future. In the interim, signal timing revisions may be available to manage queuing impacts.

The proposed new westbound off-ramp from SR 518 connecting to International Boulevard would require revisions to the SR 518 mainline. It would diverge from westbound SR 518 at a point where the westbound collector-distributor road begins. The controlling design criteria for the new ramp would be a 600- to 800-foot spacing between successive off-ramps. The entrance to the collector-distributor road would therefore be shifted 600 to 800 feet to the east, requiring widening along the north side of SR 518.

Revision of the diverge point from the westbound SR 518 mainline also would require that an auxiliary lane be provided from the entrance ramp at 51st Avenue South to the new C-D road exit. This modification would require widening of SR 518 to the north, including widening of the bridge over 42nd Avenue South. It would also be in the vicinity of the Sound Transit light rail line and Gilliam Creek. The new auxiliary lane would form a fourth westbound lane in this vicinity.

Alternative 2e is recommended for advancement into the permitting, impact assessment, and preliminary engineering stages of project development. The project will require ongoing coordination with WSDOT, Sound Transit, and the City of SeaTac.
Figure 2
Alternative 1c
Figure 3
Alternative 2b
Figure 4
Alternative 2e