3.0 DEVELOPING THE ALTERNATIVES

In response to Washington's 1990 Growth Management Act (GMA), Clark County adopted a comprehensive plan in 1994 that identified four growth centers within the Vancouver area, including Salmon Creek (Clark County, 1994). The challenge facing the area then was the ability of the existing transportation network to meet the anticipated demand based on growth in the area. According to the Clark County comprehensive plan, the transportation needs of this area would be served by I-5, the county arterial system, and the planned high-capacity transit system. In 1995, however, the future of high-capacity transit service to Salmon Creek became uncertain when voters rejected a proposed funding package. Over the next 10 years, a range of options was developed to address transportation needs.

3.1 What previous studies led to the Salmon Creek Interchange Project?

Over the past decade, a number of alternatives have been developed and analyzed in an effort to improve traffic mobility in the Salmon Creek area. These processes, which led to the alternatives analyzed in this Environmental Assessment (EA), are described in the following sections.

3.1.1 Salmon Creek/Fairgrounds Regional Road Plan

After voters rejected the funding package for high-capacity transit service, the county embarked on a subarea transportation planning effort and in 1997 published the Salmon Creek/Fairgrounds Regional Road Plan (KCM Inc., 1997), which clearly indicated that changes to the NE 134th Street interchange with I-5 were needed to accommodate the growth expected in the Salmon Creek area.

3.1.2 I-5/I-205 Corridor Strategy Report

In 2001, WSDOT issued the I-5/I-205 Corridor Strategy Report: North Corridor Study and Route Development Plan (Parsons Brinckerhoff, 2001), which analyzed short- and long-term transportation needs along a 14 mile segment of I-5 and I-205 in the north Clark County area. The study identified strategies for improving transportation in the corridor, while addressing issues related to land use, environmental, and physical constraints. The North Corridor Study and Route Development Plan included the following alternatives:

- No build
- Local improvements only
- Transit/transportation demand management/transportation system management
- Full diamond interchange for I-5/NE 134th street and I-205 southbound loop
- Full diamond interchange for I-5/NE 134th Street and flyover ramps for I-205 with extension to NE 139th Street, and NE 139th Street overcrossing of I-5

These alternatives were carried forward into an Access Decision Report, which is required by the Federal Highway Administration (FHWA) before changes can be made to interstate highway interchanges.

Interchange Designs:

Full Diamond Interchange – A full diamond interchange has movements in all four directions- northbound and southbound off as well as northbound and southbound on. Usually, the shape of the interchange is similar to the shape of a diamond.

3/4 Interchange – A three-quarter interchange has three of the four possible movements of a full interchange.

1/2 Interchange – A half interchange generally has an on- and an off-ramp.

3.1.3 Access Decision Report

The Access Decision Report (Parsons Brinckerhoff, 2002) recommended a modification to the alternative at NE 134th Street that included:

- A full interchange at NE 134th Street and I-5
- New crossings of I-5 at NE 139th Street and NE 154th Street
- Relocating the existing Park-and-Ride to the west of I-5 on NE 139th Street
- HOV-only ramps from I-5 HOV lanes to the NE 139th Street overcrossing
- A new ramp from NE 134th Street to southbound I-205 located with the existing northbound I-205 off-ramp
- An additional off-ramp from northbound I-205 to NE 20th Avenue
- An additional on-ramp from NE 20th Avenue to southbound I-205

This alternative received conditional FHWA approval in 2002; however, subsequent study and analysis indicated that it would have required limited HOV lane hours and left-hand merges or diverges that were unusual and potentially could have resulted in an increased collision rate. For these reasons, the recommended alternative previously approved was subsequently rejected by the FHWA.

Access Decision Report (2002) Preferred Operational Alternative

3.2 How was the Salmon Creek Interchange Project developed?

To respond to the issues that resulted in the rejection of the alternative in the Access Decision Report (Parsons Brinkerhoff, 2002), an additional study was completed. The study showed that network improvements without interstate access modification would not fully resolve the operational and/or safety issues in the Salmon Creek area. It was also determined that improving existing interchanges alone would not alleviate current and future mobility and safety deficiencies at the NE 134th Street interchange along I-5 and I-205, nor would they improve mobility on NE 134th Street for regional trips to and from central and west Clark County.

Several alternatives were developed that shifted some or all of the interchange access to a new NE 139th Street crossing. Some alternatives included partial interchanges, both at NE 134th Street and NE 139th Street, while others provided for a full interchange at I-5 and NE 139th Street and partial interchanges at I-5/NE 134th Street and I-205/NE 134th Street.

Of the alternatives developed, three were refined and carried forward for further study:

- Alternative A: Single-point urban interchange (SPUI) at NE 139th Street and I-5 would be located underneath I-5, with a new flyover ramp for southbound I-205 from I-5; the flyover would be elevated above both I-5 and NE 139th Street.
- Alternative B: Tight-diamond interchange at NE 139th Street and I-5 would be constructed to cross above I-5, with NE 139th Street over I-205.
- Alternative C: SPUI at NE 139th Street would be located over I-5; I-205 would remain underneath I-5.

The traffic analysis conducted to analyze the SPUI and the tight diamond concepts determined that Alternative A had excessive cost and Alternative B would have limited capacity past the year 2030. Thus, Alternative C became the recommended alternative.

What is a single-point urban interchange (SPUI)?

The single-point urban interchange, abbreviated as SPUI and pronounced "spoo-ee," is an intersection where all of the left-turn movements needed to enter and exit the major roadway (versus the cross-road) are concentrated at a single, signalized intersection. That single intersection may be located over the main road on a structure or beneath the main road (at grade).

What is a tight diamond interchange?

A tight diamond interchange is similar to the full diamond interchange (which has movements in all four directions, usually in the shape of a diamond) except that the signals are a slightly different design and the ramp spacing is closer together.

What were the initial three alternatives examined?

A. SPUI at NE 139th Street located beneath I-5; I-205 flyover ramp
B. Tight-diamond interchange at NE 139th Street located above I-5; NE 139th Street over I-205
C. SPUI at NE 139th Street located above I-5; I-205 and Ne 139th Street located beneath I-5

3.2.1 Design Review and Project Development

With the recommendation of the SPUI at NE 139th Street under I-5, WSDOT and Clark County began environmental site analyses and engineering studies to develop detailed

design information for the project. These analyses and studies realized several issues and constraints that affected project design:

1. Site analysis proved that poor soil conditions and high groundwater exist throughout the project site; extensive temporary and permanent dewatering systems would be necessary to construct and maintain the SPUI design.
2. The structures would require major ground improvements to mitigate the threat of earthquake-related ground movement and settlement.
3. Wetland investigations identified a state-listed protected wetland plant species on the site.
4. The updated regional traffic model from the Clark County Comprehensive Land Use Plan dictated the need to relocate the Park-and-Ride lot in order to maintain the necessary level of service and concurrency on NE 134th and not back up traffic on the I-5 northbound off-ramp.
5. The replacement of the I-5 structure over southbound I-205 or the replacement of NE 134th Street would be necessary with either an overpass or underpass design.
6. Industry-wide escalation of material costs drove the total project estimate to approximately $150 million at the end of 2005.

Given these issues and constraints, the project team completed another round of alternatives analysis to determine the most efficient and cost effective project design that would meet the traffic and land use needs and avoid and/or minimize the environmental effects to the resources in the area. In this process, WSDOT and Clark County reviewed and analyzed numerous alternatives. These alternatives were evaluated based on the following criteria:

1. The ability to meet the project purpose and need: to improve the transportation facilities in the project study area to improve mobility and safety (see Chapter 2).
2. The ability to provide an acceptable environmental outcome and avoid and or minimize effects to natural resources in the area as much as possible.

3. The provision of a benefit of return on investment several times the investment cost through reduced travel times and increased freight speeds.

Based on the outcome of the first level of screening, three alternatives were carried forward to a second level of screening based on design and right-of-way acquisition requirements. The three alternatives advanced for further screening included:

- Alternative No. 1: At-grade SPUI (full interchange at NE 139th Street, existing 1/2 interchange at NE 134th Street)
- Alternative No. 2: 3/4 interchange at NE 139th Street, 3/4 I-5 interchange at NE 134th Street
- Alternative No. 3: Offset 3/4 interchange at NE 139th Street, existing 1/2 interchange at NE 134th Street, and existing I-205 southbound off-ramp at NE 134th Street

Alternative No. 3 was recommended and approved for inclusion in the EA because it meets the project purpose and need (Chapter 2), provides acceptable traffic performance, is cost effective, allows for the opportunity of phasing, and reduces property and environmental effects.

A refined version of Alternative No. 3 is the Proposed Build Alternative in this EA. It has been further refined based on study of the environmental resources in the project study area. A No Build Alternative is also examined in this document. Chapter 5 includes a complete description of these two alternatives.

What were the three alternatives advanced for further screening?

Alternative No. 1–At-grade SPUI; full interchange at NE 139th Street; existing 1/2 interchange at NE 134th Street

Alternative No. 2–3/4 interchange at NE 139th Street; 3/4 I-5 interchange at NE 134th Street

Alternative No. 3–Offset 3/4 interchange at NE 139th Street; existing 1/2 interchange at NE 134th Street; existing I-205 southbound off-ramp at NE 134th Street