

White Paper

Screening of Value Engineering Study Alignment Recommendations

SR 509/South Access Road

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June 9, 1999

Introduction

The Executive Committee, at its meeting on April 8, 1998, selected four alternatives from among seventeen options for further examination in the Supplemental Draft EIS. The selection of those alternatives, referred to as "A" (No Action) and build alternatives "B", "C", and "D", was the culmination of a lengthy and detailed design and screening process described in the white paper entitled *Development and Screening of SR 509/South Access Road Alignment Alternatives*, dated May 28, 1998. Alternative C was identified by the Committee as the preferred alternative. At the time of the Executive Committee's selection, the three build alternatives were considered the most feasible and reasonable alternatives to be carried forward into the EIS, based on the screening criteria used and the numerous natural and built environmental constraints considered.

The purpose of this white paper is to evaluate several new alignment options and to compare them to Alternatives B, C, and D. The new options have been developed as a result of a Washington State Department of Transportation Value Engineering (VE) exercise described below.

Value Engineering Study Results

During the week of February 8 - 12, 1999, WSDOT assembled a VE team to evaluate the existing EIS alternatives. The team prepared and transmitted a report on February 23, 1999 entitled *Value Engineering Study Report: SR 509 Corridor and South Access Road*. The team objective was:

"Improve upon the value of the proposed or new alternatives by using the eight stated objectives to define the project functions"

These objectives were:

- 1) Support local and regional comprehensive planning and development
- 2) Improve access to airport for south oriented customers
- 3) Relieve local congestion
- 4) Improve regional mobility and safety
- 5) Be comparable with connections to high capacity transit
- 6) Develop broad public support for selected alternative
- 7) Design project in environmentally responsible manner
- 8) Provide cost effective alternatives and solutions

The team noted that there are a large number of project constraints when developing alignments. Much of the discussion of the team centered around the fatal flaw constraints used in the development of the Draft EIS alternatives. One such constraint is to completely avoid Des Moines Creek Park. After extensive conversations with Department of Interior representatives on the VE team, the team elected to remove the constraint of total avoidance of the park. Alternatives to be developed now could have some park impacts.

Another constraint was that no roads were to cross the airport's Object Free Area (OFA) and roads within the Extended OFA (XOFA) would require covering with a structure similar to a snowshed, only for airplanes. This "airplane shed", or tunnel as others termed, has severe safety constraints associated with an

explosion in the tunnel or the more likely scenario of one at either portal. The team hopes to remove the need for a tunnel by moving the roads crossing the XOFA as far to the south as possible.

The significant number of relocations associated with the mobile home parks was another area evaluated and ideas formulated for cost reductions.

The team adjusted these three constraints allowing additional flexibility in the development of alternatives. This approach created alternatives that had shared impacts rather than those that would have no impact on one resource at the expense of severe impacts to others. The team created suggestions for modifications to Alternatives B, C and D using this approach and the objectives stated previously.

Existing Alternatives

Each of the new options formed for study within this white paper is a progression from the existing build alternatives. Alternatives B, C, and D are described below.

Alternative B

Alternative B (Figure 1) proposes the extension of SR 509 from its existing terminus at South 188th Street on the north to the proposed intersection with I-5 in the vicinity of South 210th Street on the south (although collector/distributor roads along I-5 between the new SR 509 interchange and the existing SR 516 interchange and additional auxiliary lanes between SR 516 and the South 272nd Street interchange are also proposed). SR 509 and a new South Access Road would generally parallel each other in a north-south orientation on the west and east sides, respectively, of Des Moines Creek Park, with a proposed interchange of the roadways west of the proposed 28th/24th Avenue South arterial alignment near South 210th Street. The South Access Road would skirt the eastern Controlled Activity Area (CAA), avoid the Object Free Area (OFA), and clip the southwest and northwest corners of the South Aviation Support Area (SASA). A full diamond interchange would be provided at the SR 509/South 200th Street intersection to the west of the Des Moines Creek Park; a half diamond interchange would be provided at the South Access Road/South 200th Street intersection to the east of the park. In order to intersect with the South Access Road, SR 509 would divert from the existing SR 509 right-of-way at roughly South 200th Street and extend southward, parallel to and near 15th Avenue South. SR 509 would pass through Des Moines Creek Park at its narrowest point in the vicinity of South 209th Street, and cross over Des Moines Creek on four separate bridges (to accommodate the SR 509 mainline and the ramps associated with a diamond interchange at 28th/24th Avenue South).

Alternative C

Alternative C (Figure 2) proposes a SR 509 alignment further to the east in order to eliminate direct impacts to Des Moines Creek Park, thereby increasing the impacts to the SASA. In Alternative C, SR 509 would divert from the existing SR 509 right-of-way north of South 200th Street and traverse easterly across the CAA, the middle of the extended OFA (XOFA), and the Federal Aviation Administration (FAA) light lane. The FAA has indicated that the roadway would need to be cut and cover through the extended OFA. In addition, construction would need to accommodate the aircraft landing lights that are mounted on towers spaced at intervals of 100 feet. The SR 509 mainline would "thread the needle" between the northeast corner of Des Moines Creek Park, the southwest corner of the SASA, and the western boundary of the Federal Detention Center. The alignment would not directly impact the park (thus Alternative C may be considered a Section 4(f) avoidance alternative), but would impact the Federal Detention Center stormwater detention pond in the southwest corner of that property and SASA. As the design is further refined, it may be possible to reduce these impacts. The SR 509 mainline would continue southeasterly to an eventual intersection with I-5 (as with Alternative B, noted above, collector/distributor roads would be developed along I-5 south to the SR 516 interchange and auxiliary lanes to the South 272nd Street interchange). The South Access Road would extend northward along the SASA, requiring portions of its western side.

Alternative C proposes three half-diamond interchanges connected by either frontage roads or through the surface street network, and a grade-separated interchange between SR 509 and the South Access Road. A half-diamond interchange at SR 509 and 28th/24th Avenue would serve movements from the City of SeaTac to and from the south on SR 509. A half-diamond interchange at the South Access Road/South 200th Street would provide for movements to and from the airport on the South Access Road. The westerly SR 509/South 200th Street interchange would serve movements from the airport and City of SeaTac to and from the north on SR 509.

Alternative D

Alternative D (Figure 3) would extend from the existing SR 509 terminus on the north and the SR 516/I-5 interchange on the south (plus additional auxiliary lanes along I-5 between the SR 516 and South 272nd Street interchange). The proposed SR 509 alignment would stay within the existing SR 509 right-of-way in the vicinity of South 200th Street, clip the western CAA, and cross Des Moines Creek once, requiring two bridges. The South Access Road would extend southwesterly through the airport CAAs and OFA (the FAA has indicated that the roadway would need to be cut and cover through the OFA), pass under SR 509 north of South 200th Street, and eventually intersect with SR 509 in the vicinity of South 208th Street. The SR 509/South Access Road interchange would require most of Port of Seattle-owned Redevelopment Area 4 and the northern half of Redevelopment Area 3. Alternative D would extend far enough south of South 216th Street before turning southeasterly to avoid the proposed Des Moines Sports Park. SR 509 would then join I-5 at the SR 516 interchange. Minor modification to the SR 509/SR 516/SR 99/I-5 interchange would be needed to avoid direct impact to a hazardous waste contaminated site (a former auto repair shop) at SR 516 and 28th Avenue South.

The proposed design includes a full interchange between SR 509 and South 200th Street and half interchanges between the South Access Road and South 200th Street and between SR 509 and SR 516. Modifications to I-5 may include reconstruction at the SR 516 interchange and collector-distributor roads to the South 272nd Street interchange. Ultimately, SR 509 would have two general traffic lanes in each direction and center HOV lanes with direct connections to I-5. The South Access Road would have two lanes in each direction.

First Level Screening

Alternatives B, C, and D, featured in the 1999 discipline reports, were developed on the premise that Section 4(f) impacts must be avoided unless there is no reasonably feasible and prudent alternative. However, the VE Study considered that avoidance of other environmental constraints may necessitate impacts to Section 4(f) properties. The existing alternatives were modified in an attempt to find new options that would avoid or reduce impacts to the FAA's Runway Protection Zones (RPZs), wetland/mitigation areas, and low income areas (SeaTac's mobile home parks) while also keeping Section 4(f) impacts to a minimum. Options 22, 23, and 24 were modifications of Alternative B; Options 18, 19, 20, and 21 were modifications of Alternative C; Option VE-D1 was the lone modification of Alternative D, which had resulted from the VE Study. These eight options were qualitatively screened by the Steering Committee in order to find the most reasonable options to be studied in this White Paper.

The following is an explanation of why Options 18, 20, 22, 24, and VE-D1 were rejected from further consideration. Each option was compared to its alternative.

Option 18

- SR 509 alignment would take more land from Des Moines Creek Park than Alternative C
- SR 509 alignment is further south in the XOFA but would still require tunneling according to the FAA
- Mobile home impacts would be severe

Option 20

- Geometrical alignment would be extremely curvy, hindering traffic flow
- Would have larger impacts to wetlands
- Would have larger impacts to the Port of Seattle's Redevelopment Areas west of the mobile home parks
- A tunnel would probably be required through the FAA zones
- Some parkland would be taken from Des Moines Creek Park

Option 22

- Would have greater impacts to Des Moines Creek Park and wetlands
- SR 509 and South Access Road alignments would take much of Port of Seattle's Redevelopment Areas
- Geometries would not be as good as other options

Option 24

- Would miss the narrowest section of Des Moines Creek Park, resulting in a greater park take
- Impacts to Port of Seattle's Redevelopment Areas would be large
- Impacts to wetlands would be greater
- Geometries would not be poor

Option VE-D1

- Des Moines Creek Park would be impacted
- Alignment would not be compatible with City of Des Moines and City of SeaTac Comprehensive Plans (commercial redevelopment/industrial land would be impacted)
- Vertical alignment would be too difficult for freight mobility
- Impacts to Port property would be greater

Description of Options Surviving the First Level Screening

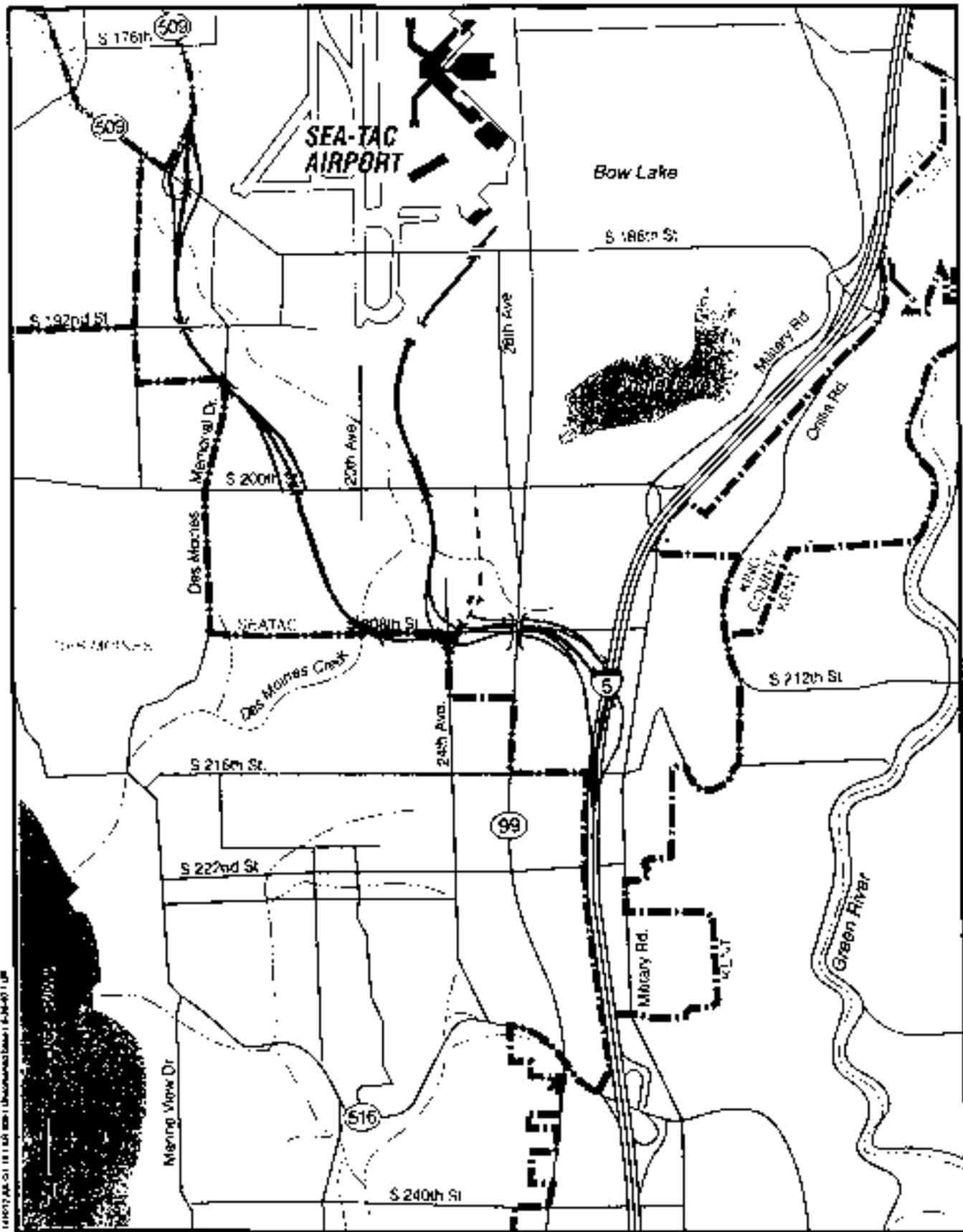
The Steering Committee, at its meeting on April 23, 1999, decided to carry Options 19, 21, and 23 forward into the second level screening process. They also decided that two new options should be created and carried forward. The first was Option 25, which was to be a progression from Option 21 that would move the alignment of the northern arm of SR 509 to the south. The second new option, Option VE-D2 would be a hybrid of the northern half of VE-D1 and the southern half of Alternative D. A description of each of the options follows.

Option 23

In Option 23 (Figure 4), a variation of Alternative B, the alignment of the northern arms of SR 509 and South Access Road (north of South 200th Street) would be the same as in Alternative B, running generally parallel to each other on opposite sides of Des Moines Creek Park. Collector/distributor roads along I-5 between the new SR 509 interchange and the existing SR 516 interchange and additional auxiliary lanes between SR 516 and the South 272nd Street interchange would also be included. The main difference in this option is that the mainline SR 509 alignment would run in between the mobile home park and Christian Faith Center School several hundred feet to the south of Alternative B's alignment. In order to do this, SR 509 would begin its southeasterly curve toward Des Moines Creek Park slightly further northeast. The alignment of SR 509 as it crosses the Port of Seattle's Redevelopment Area 3 would be roughly 500' northeast of Alternative B's alignment. This alignment would cause SR 509 to miss the narrowest point of Des Moines Creek Park, taking more land. SR 509 would then continue east until its interchange with I-5 at roughly South 210th Street. Along with the interchanges in Alternative B, this option features a half-diamond interchange between SR 509 and South 200th Street and a half-diamond interchange between the South Access Road and South 200th Street where the ramps connect to South 200th Street in a single intersection. Alternative B's north-oriented ramps from 28th/24th Avenue South to SR 509 and the interchange ramps between the South access Road and 28th/24th Avenue South would be eliminated.

Option 19

Option 19 (Figure 5) is a variation of Alternative C that would impact Des Moines Creek Park as well as nearby wetlands. SR 509 would divert from the existing SR 509 right-of-way north of South 200th Street and traverse easterly, impacting the northwest ponds. The alignment would then be pulled south, placing it in the southern one-third of the OFA/XOFA zone and eliminating the "airplane snowshed" requirement (the need for a cut-and-cover tunnel). Although the alignment impacts the northwest ponds as drawn, it could be modified in order to miss them by moving the alignment slightly to the south, closer to existing residential neighborhoods. The South Access Road would have the same alignment as in Alternative C, although its ramps would be pulled in tighter, reducing impacts to the SASA. The SR 509 alignment would clip Des Moines Creek Park and pass through the 28th/24th Avenue South detention pond site before curving towards the southeast, where it would join with I-5 in the vicinity of South 210th Street. Collector/distributor roads along I-5 between the new SR 509 interchange and the existing SR 516 interchange and additional auxiliary lanes between SR 516 and the South 272nd Street interchange would also be included. As in Alternative C, collector and distributor roads would be developed along I-5 south to the SR 516 interchange and auxiliary lanes to the South 272nd Street interchange. This option would feature a tight half-diamond interchange at 28th/24th Avenue South with frontage roads between 28th/24th Avenue South and South 200th Street, a half-diamond interchange at South 200th Street and 18th/16th Avenue South, and a half-diamond interchange between South Access Road and South 200th Street. A south-oriented half-diamond interchange between South Access Road and SR 509 would also be developed.



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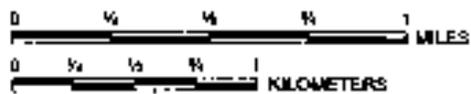


FIGURE 4
OPTION 23
 **SR 509 South Access Road Corridor EIS**

Option 21

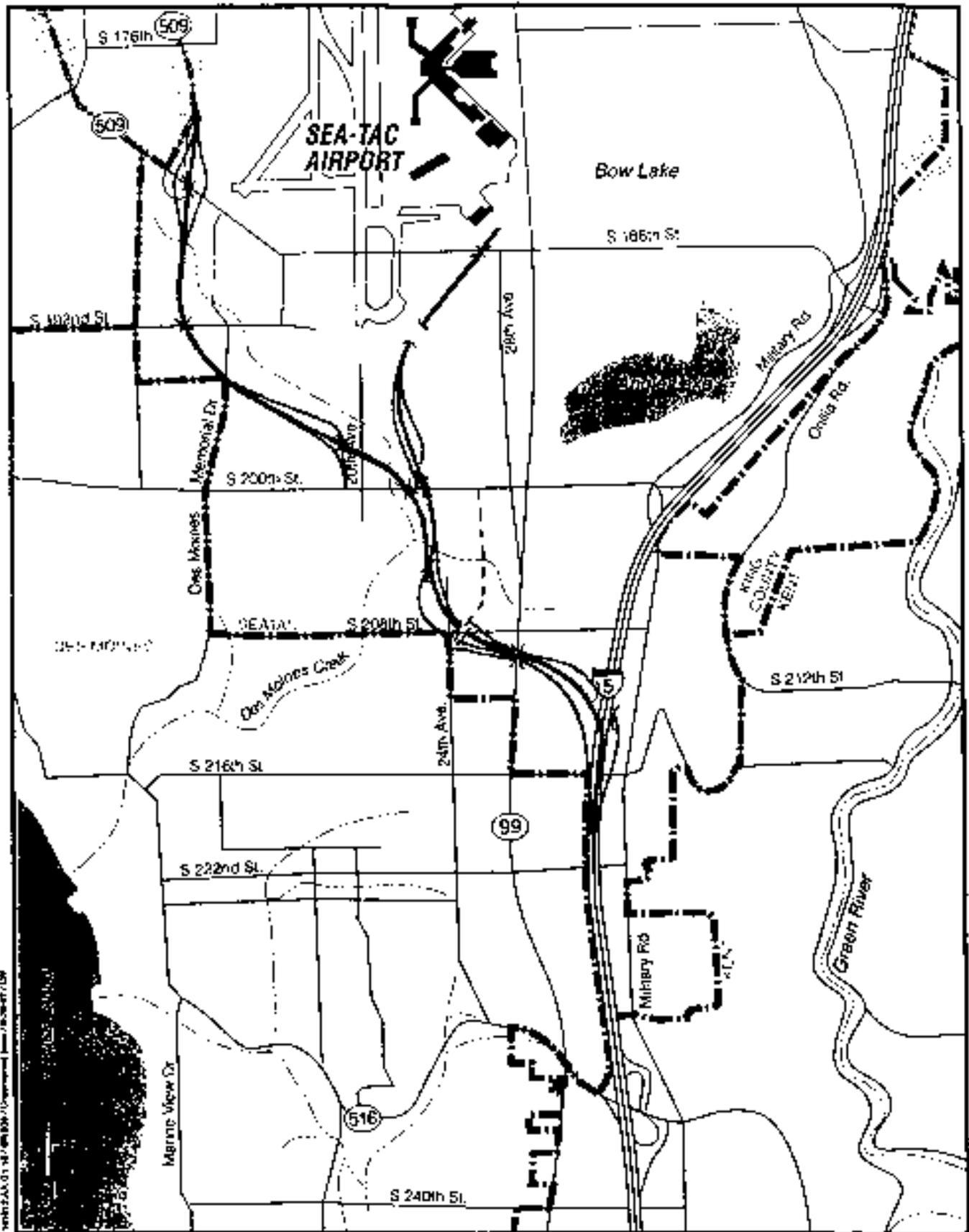
Option 21 (Figure 6) is a further progression from Alternative C than Option 19. The key difference between Option 21 and Option 19 is that Option 21 would avoid direct impacts to the mobile home parks. The SR 509 alignment would be the same as in Option 19, leaving the existing right-of-way north of South 200th Street and impacting the northwest ponds. This section could also be modified to avoid the northwest ponds. It then would travel through the southern one-third of the OFA/XOFA zone. The South Access Road would also have the same alignment as in Option 19. Bridges and retaining walls would be used as the mainline of SR 509 crosses through wetlands and Des Moines Creek Park, resulting in smaller impacts. This option would impact the 28th/24th Avenue detention pond site but pass south of the mobile home parks as it curved southeasterly toward its interchange with I-5 roughly at South 210th Street. Option 21 would feature the same interchanges as Option 19 except that the interchange between the South Access Road and South 200th Street would be slightly modified and no frontage roads would be constructed between South 200th Street and 28th/24th Avenue South. The South Access Road/South 200th Street interchange would be a half-diamond interchange where the ramps connect to South 200th Street in a single intersection. The northbound onramp of this interchange would weave under the South Access Road.

Option 25

Option 25 (Figure 7), a revision of Option 21 and Alternative C, is very similar to Option 21 except that it has less impacts to wetlands. SR 509 would leave the existing right-of-way a little further south, missing the northwest ponds. It would then curve southeasterly across the southern one-third of the OFA/XOFA zone. The South Access Road alignment is the same as in Option 21. SR 509 would clip the corner of Des Moines Creek Park, impacting the 28th/24th Avenue South detention pond site but avoiding the mobile home parks. As in the other options, SR 509 would intersect with I-5 at roughly South 210th Street. All of the interchanges would be the same as in Option 21.

Option VE-D2

Option VE-D2 (Figure 8), a progression from Alternative D, would have the same alignment as Alternative D south of South 210th Street. SR 509's mainline would cross Des Moines Creek within the existing right-of-way with two bridges. Heading north, SR 509 would pass between Hillgrove Cemetery and Des Moines Creek Park without taking land from either area. SR 509 would cross over South 200th Street and curve northwesterly, missing the northwest ponds. Ramps to and from South Access Road would travel under SR 509 and over South 200th Street. The South Access Road would pass through the lower one-third of the OFA/XOFA zone, avoiding the need for a tunnel or road cover. SR 509 would have the same interchanges as Alternative D with a couple of exceptions: a diamond interchange with South 200th Street and a south-oriented half-diamond interchange with the South Access Road.



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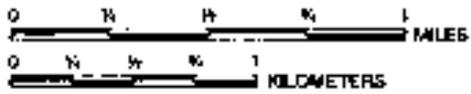
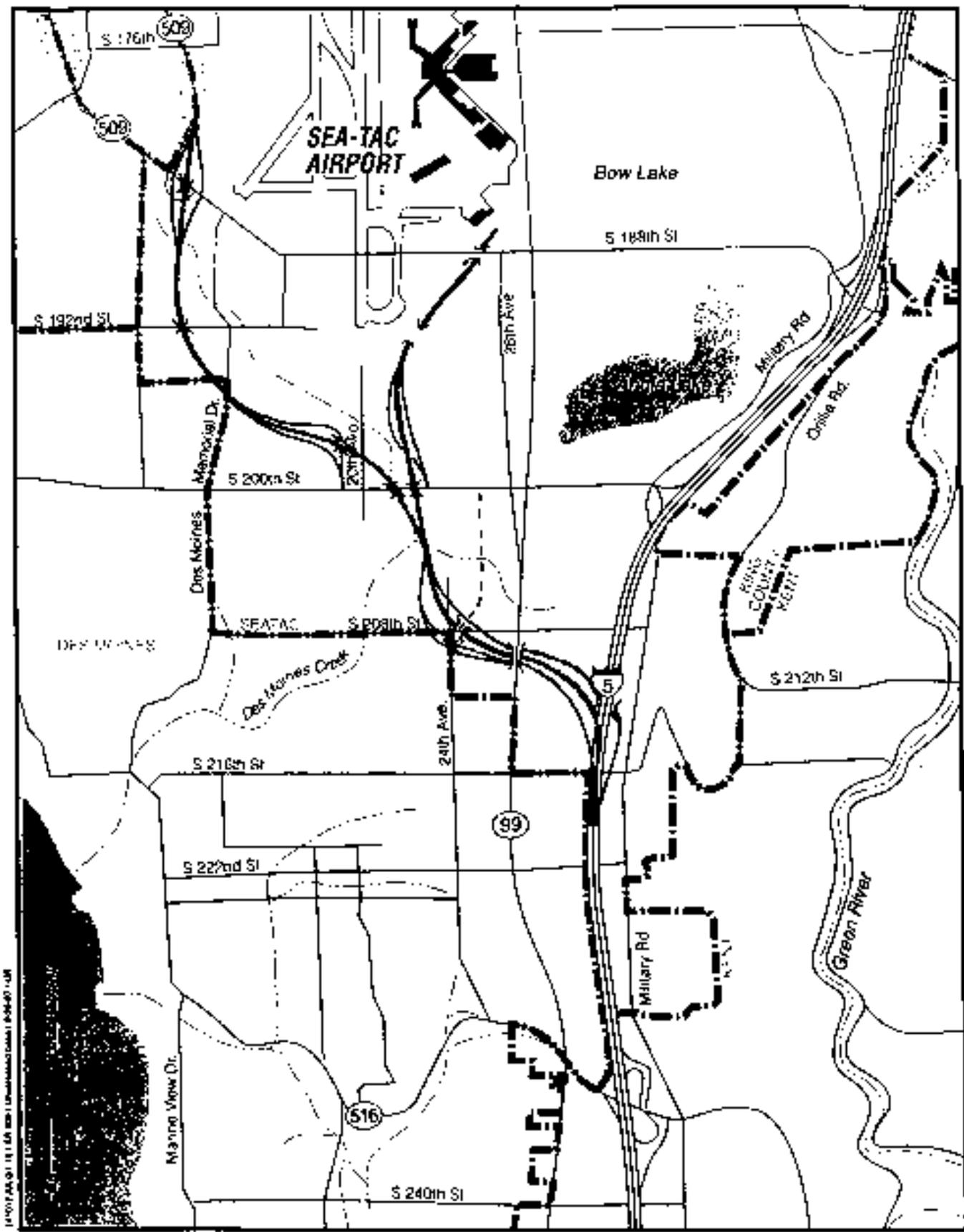


FIGURE 6
OPTION 21
 SR 509/South Access Road Corridor EIS



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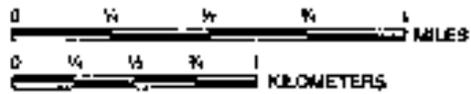


FIGURE 7
OPTION 25
 SR 509/South Access Road
 Corridor EIS

Second Level Screening

For the second level screening, all options were evaluated against their parent alternative on the basis of specific environmental features and constraints, including:

- Section 4(f) Property-Des Moines Creek Park
- Historic/Archaeological Resources-Hillgrove Cemetery
- Wetlands and Streams
- Hazardous Waste Contaminated Sites
- South Aviation Support Area (SASA)
- FAA's Sea-Tac Airport Restricted Areas
- Potential Displacements/Residences, Mobile Homes and Businesses
- Port of Seattle Redevelopment Areas
- Noise
- Cost

Those environmental constraints were the same criteria used in other white papers. As this project has progressed, other constraints have come to light that the Steering Committee felt should be included in the analysis. The Steering Committee directed that an expanded list of environmental feature and constraints should be used for the second level screening of the remaining options. New features included:

- ABC-Zoned Land/Economic Development Campus – Areas of planned commercial redevelopment in SeaTac
- The proposed detention facility for the 28th/24th Avenue Arterial project
- Alignment Geometrics

Comparison of Options

Tables 1, 2, and 3 have been prepared to assist in the comparison of each option to its respective alternative. The matrix provides a brief statement of potential impacts as a result of each of the options.

It should be noted that some differences in impacts between alternatives and their options are a result of different levels of refinement. Alternatives B, C, and D have been designed to an EIS-study level and have been modified to avoid certain environmental constraints. The options have been designed in much less detail, thereby reflecting some impacts that may be avoidable or could be minimized by detailed design. For example, Alternative C has 187 multifamily displacements and 401 noise-impacted sensitive receptors. This is, in large part, due to the fact that Alternative C's right-of-way has been pulled in tight between Pacific Highway South and I-5, sparing several apartment units. However, each apartment unit spared has effectively become a noise-impacted sensitive receptor. Option 19, which has not been developed to the same amount of detail, still shows a wide right-of-way through this same area. Consequently, Option 19 has 320 multifamily displacements and only 162 noise-impacted sensitive receptors. While this example does not account for all of the differences between alternatives and options, it illustrates that options can be almost infinitely adjusted to shift impacts. This needs to be taken into consideration while examining the data.

Alternative B and its corresponding Option 23 trade off impacts on different environmental constraints. Option 23 would take more land from Des Moines Creek Park because it crosses the park further north, missing its narrowest point. While Option 23 would encroach slightly into an FAA Restricted Area, neither Option 23 nor Alternative B would require a tunnel. The Port of Seattle's Redevelopment Area 3 would

suffer greater impacts by Option 23, and no interchange ramps to 28th/24th Avenue South (serving the Aviation Business Center) would be provided. Option 23 would also have more residential displacements and slightly more business displacements. Alternative B however, would have more sensitive receptors impacted by noise. Alternative B would impact two more wetlands than Option 23, including the northwest ponds. It would also take more land from the SASA. Neither Alternative B nor Option 23 would impact land with planned commercial redevelopment in SeaTac. Both would have the same historical/archaeological and hazardous waste contaminated sites impacts, and both would impact the 28th/24th Avenue Arterial detention pond site. Alternative B would cost \$11 million dollars more than Option 23.

Alternative C and its three options, 19, 21, and 25, have the same level of impact with regards to historical/archaeological sites and hazardous waste contaminated sites. Alternative C would be better than all of its options in terms of Section 4(f) impacts; it would be the only alignment that did not clip the northeast corner of Des Moines Creek Park. Alternative C and Option 25 would impact the fewest wetlands and would also miss the northwest ponds. Options 19 and 21 impact the northwest ponds, but could be modified in order to miss them. Each of the options is located in the southern one-third of the OFA/XOFA zone; the FAA has indicated that this would be sufficiently far south enough to eliminate the necessity of a tunnel or road cover through this zone. (Alternative C would need to be tunneled or covered.) Each of the options also have their ramps associated with the South Access Road pulled to the west, minimizing impacts to the SASA; Alternative C would have greater impacts to the SASA. Alternative C however, would have the least amount of impact on the POS Redevelopment Areas. While Alternative C would only impact Redevelopment Area 4, each of the options would impact Redevelopment Areas 4 and 1. Options 21 and 25 both would impact planned commercial redevelopment land in SeaTac. Alternative C would be the only alignment to miss the 28th/24th Avenue Arterial detention pond site. Option 21 would have the fewest single family and multifamily displacements, followed by Option 25 and Alternative C. Option 19 would have the most single family and multifamily displacements. Only Alternative C and Option 19 would have mobile home displacements. Option 19 would have the most business displacements, with Option 25 having the fewest. As drawn, each option has less than half the amount of noise impacted receptors when compared to Alternative C. However, this is mainly because Alternative C's right-of-way has been pulled in tight through a multi-family area around South 208th Street to minimize property takes. Each of these dwelling units spared by the tight right-of-way has turned into a noise-impacted sensitive receptor, illustrating a trade-off. Option 21 would be the cheapest alignment, followed by Options 19 and then Alternative C. Option 25 would be the most expensive alignment.

Alternative D and Option VE-D2 would have the same impact on Section 4(f) properties, historical/archaeological sites, and hazardous waste contaminated sites. Alternative D would impact fourteen wetlands, including a Class 1 wetland and two "Significant Wetlands". ("Significant Wetland" is the highest wetland classification assigned by the City of Des Moines. It is the rough equivalent of a Class 1 Wetland; Class 1, 2, and 3 designations are used by the City of SeaTac and most other local and state agencies.) Half of the sixteen wetlands that Option VE-D2 would impact are Class 3 wetlands, and two of them are "Significant Wetlands". Option VE-D2 would cross in the lower one-third of the OFA/XOFA zone, while Alternative D would cross much further north through the OFA, necessitating a tunnel or road cover. The SASA would be impacted by the South Access Road alignment in VE-D2, but would not be affected under Alternative D; more Port of Seattle Redevelopment land would be taken under Alternative D. Twenty-three more residential displacements would occur with Option VE-D2; business displacements and mobile home displacements would be the same. Conversely, twenty-four more noise-sensitive receptors would be impacted by Alternative D. Option VE-D2 would cost \$8 million dollars more than Alternative D.

TABLE 1
Matrix of Potential Impacts for Alternative B Options

Environmental Features/Constraints	Alternative B	Option 23
<p>Section 4(f) Properties</p> <p>SF 509 would impact Des Moines Creek Park at its narrowest point.</p> <p>Crossing of S 200th Street on Des Moines Creek Trail. If it is extended northward, it could be more difficult for pedestrians and bicyclists due to the increased width of S 200th Street.</p>	<p>SF 509 crosses just north of the narrowest point of Des Moines Creek Park, taking slightly more land than Alternative B.</p> <p>The Des Moines Creek Trail would be impacted similarly to Alternative B.</p>	
<p>Historic/Archaeological Resources</p>	<p>No impacts.</p>	<p>Same as Alternative B.</p>
<p>Wetlands/Streams</p>	<p>14 wetlands would be impacted:</p> <ul style="list-style-type: none"> • 1 Class 1 • 1 "Significant Wetland" • 3 Class 2 • 3 Class 3 <p>SF 509 would impact the NW ponds.</p> <p>3 crossings of Des Moines Creek and its tributaries ranging from Class 2 to unclassified.</p>	<p>12 wetlands impacted:</p> <ul style="list-style-type: none"> • 1 "Significant Wetland" • 1 Class 2 • 10 Class 3 <p>SF 509 would not impact the NW ponds.</p> <p>Same as Alternative B.</p>
<p>Hazardous Waste Contaminated Sites</p>	<p>Three substantially contaminated properties and nine potentially, predictable contaminated sites may be impacted by construction of Alternative B.</p>	<p>Same as Alternative B.</p>
<p>FAA Restricted Areas</p>	<p>SF 509 would extend into the western edge of the CAK of the future third runway.</p> <p>The South Access Road would closely parallel, but not approach, the eastern edge of the CAK of Runway 16L/34R.</p> <p>The Alternative would not require a tunnel.</p>	<p>Same as Alternative B.</p> <p>The South Access Road would approach the eastern edge of the CAK of Runway 16L/34R.</p> <p>The Option would not require a tunnel.</p>
<p>SASA Site</p>	<p>The South Access Road would die the northwest corner of the SASA, and extend along and approach with the western edge of the SASA.</p>	<p>The South Access Road would be farther to the west, impacting the SASA less.</p>
<p>28th 34th Avenue South Aerial Detention Pond</p>	<p>SF 509 would impact the whole site.</p>	<p>Same as Alternative B.</p>

¹City of Des Moines Classification

TABLE 1

Matrix of Potential Impacts for Alternative B Options

Environmental Features/Constraints	Alternative B	Option 22																
Port of Seattle Redevelopment Areas	SR 529 would pass through the middle of Redevelopment Area 4 before turning eastward through the southwest corner of Area 3. The SR 529 South Access Road interchange would acquire most of Redevelopment Area 1 north of S 21 st St.	SR 529 would cross through the middle of Redevelopment Area 4 but cross Redevelopment Area 3 through S 20 th further NE of Alternative B, resulting in a greater land take.																
ASU-zoned Land	1.4 ac of ASU-zoned land in Seattle would be taken as SR 529 crosses toward International Boulevard.	Land taken from ASU zones would be roughly the same, however lands north of SR 529 and South Access Road to 25 th 24 th Ave. have been eliminated in this option.																
Economic Development Campus	This Alternative would not impact the Economic Development Campus.	Same as Alternative B.																
Mobile Home Relocations	Mobile Homes: 2	Mobile homes: 1																
Single Family and Multifamily Relocations	Single Family: 136 du. Multifamily: 207 du.	Single Family: 140 du. Multifamily: 256 du.																
Business and Other Relocations	Businesses: 22 Other: 1	Businesses: 24 Other: 1																
Noise	366 sensitive receptors would be impacted: <ul style="list-style-type: none"> 13 within 100 feet of roadway 117 between 100 and 200 feet 236 between 200 and 400 feet 	374 sensitive receptors would be impacted: <ul style="list-style-type: none"> 13 within 100 feet of roadway 48 between 100 and 200 feet 258 between 200 and 400 feet 																
Costs	<table border="0"> <tr> <td>Construction:</td> <td>\$341 million</td> </tr> <tr> <td>Acquisition/Relocation:</td> <td>\$65 million</td> </tr> <tr> <td>Preliminary Engineering:</td> <td>\$21 million</td> </tr> <tr> <td>Total:</td> <td>\$427 million</td> </tr> </table>	Construction:	\$341 million	Acquisition/Relocation:	\$65 million	Preliminary Engineering:	\$21 million	Total:	\$427 million	<table border="0"> <tr> <td>Construction:</td> <td>\$309 million</td> </tr> <tr> <td>Acquisition/Relocation:</td> <td>\$51 million</td> </tr> <tr> <td>Preliminary Engineering:</td> <td>\$30 million</td> </tr> <tr> <td>Total:</td> <td>\$440 million</td> </tr> </table>	Construction:	\$309 million	Acquisition/Relocation:	\$51 million	Preliminary Engineering:	\$30 million	Total:	\$440 million
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Total:	\$427 million																	
Construction:	\$309 million																	
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Preliminary Engineering:	\$30 million																	
Total:	\$440 million																	
Geometrics	<p>Sight Distance: Tight or vertical</p> <p>Horizontal Alignment: Tight at 25th 24th Avenue South Access Road interchanges</p> <p>Vertical Alignment: Sharp or connectors to South Access Road</p> <p>Intersection Geometrics: Tight lanes</p>	<p>Sight Distance: Smooth</p> <p>Horizontal Alignment: Smooth through a minimum of 10 mph curves</p> <p>Vertical Alignment: 25th 24th Avenue South Access Road may be tight</p> <p>Intersection Geometrics: Single interchange at South Access Road and South 29th Street</p>																

TABLE 2
Matrix of Potential Impacts for Alternative C Options

Environmental Features/Constraints	Alternative C	Option 19	Option 21	Option 25
Sacred and Properties	No direct impacts to Des Moines Creek Park. The alignment would skirt Des Moines Creek Park at its northeast corner. The Des Moines Creek Trail if extended northward would need to cross beneath E 200 th Street and SR 508 via an underpass or tunnel.	SR 508 would skirt the northeast corner of Des Moines Creek Park, approaching into it roughly 300'. The presence of the SR 508 South Access Road interchange would likely preclude extension of the Des Moines Creek Trail northward.	SR 508 would skirt the northeast corner of Des Moines Creek Park, but less than Options 19 and 25. Des Moines Creek Trail would need to cross under 200 th and SR 508 via an underpass or tunnel if extended northward.	SR 508 would skirt the northeast corner of Des Moines Creek Park, but less than Option 19. The presence of the SR 508 South Access Road interchange would likely preclude extension of the Des Moines Creek Trail northward.
Historic Archeological Resources	No impacts	Same as Alternative C	Same as Alternative C	Same as Alternative C
Wetlands/Streams	<p>7 wetlands impacted:</p> <ul style="list-style-type: none"> • 1 Class 1 • 4 Class 2 • 2 Class 3 <p>SR 508 would not impact the NW ponds.</p> <p>3 crossings of Des Moines Creek and its tributaries, ranging from Class 2 to Unassessed.</p>	<p>6 wetlands impacted:</p> <ul style="list-style-type: none"> • 1 Class 1 • 4 Class 2 • 1 Class 3 • 1 Unassessed <p>As drawn, SR 508 would impact the NW ponds, however the design could be altered to avoid them, as they do in Option 25.</p> <p>Same as Alternative C</p>	<p>3 wetlands impacted:</p> <ul style="list-style-type: none"> • 1 Class 1 • 2 Class 2 • 1 Class 3 • 1 Unassessed <p>As drawn, SR 508 would impact the NW ponds, however the design could be altered to avoid them, as they do in Option 25.</p> <p>Same as Alternative C</p>	<p>7 wetlands impacted:</p> <ul style="list-style-type: none"> • 1 Class 1 • 2 Class 2 • 2 Class 3 • 2 Unassessed <p>Same as Alternative C</p> <p>Same as Alternative C</p>
Hazardous Waste Contaminated Sites	Three substantially contaminated properties and nine reasonably predictable contaminated sites may be impacted by the construction of Alternative C.	Same as Alternative C	Same as Alternative C	Same as Alternative C

TABLE 2

Matrix of Potential Impacts for Alternative C Options

Environmental Features/Constraints	Alternative C	Option 19	Option 21	Option 25
FAA Restricted Areas	SR 509 would abut into the western edge of the CAW of the future third runway and would traverse across the CAW and middle section and the OFA/OFA zone of Runway 15L/34R. The South Access Road would slightly abut into the eastern CAW of Runway 15L/34R.	SR 509 would abut into the same section of the CAW of the future third runway as Alternative C. It would cross the CAW and southern one-third of the OFA/OFA zone of Runway 15L/34R. The South Access Road would abut the eastern CAW of Runway 15L/34R.	SR 509 would abut into the same section of the CAW of the future third runway as Alternative C. It would cross the CAW and southern one-third of the OFA/OFA zone of Runway 15L/34R. The South Access Road would abut into the eastern CAW of Runway 15L/34R, similar to Alternative C.	SR 509 would abut into the same section of the CAW of the future third runway as Alternative C. It would cross the CAW and southern one-third of the OFA/OFA zone of Runway 15L/34R. The South Access Road would abut into the eastern CAW of Runway 15L/34R, similar to Alternative C.
	The Alternative would require a turn.	The Option would likely not require a turn.	The Option would likely not require a turn.	The Option would likely not require a turn.
SASA Site	The South Access Road would hit the northwest corner of the SASA and abut along and abut into the western edge of the SASA.	South Access Road's ramps would be pulled western, resulting in less impacts to the SASA.	South Access Road's ramps would be pulled western, resulting in less impacts to the SASA.	South Access Road's ramps would be pulled western, resulting in less impacts to the SASA.
22 nd 24 th Avenue South Area Detention Pond	SR 509 would abut into the eastern pond of the east.	SR 509 would impact the whole detention pond.	SR 509 would impact the whole detention pond.	SR 509 would impact the whole detention pond.
Port of Seattle Redevelopment Areas	Ramps from SR 509 would pass through the middle of Redevelopment Area 4.	SR 509 would intrude into the very northern part of Redevelopment Area 1 and the northern edge of Area 4.	SR 509 would take more of Redevelopment Area 1 than Option 19 and the northern part of Redevelopment Area 4.	SR 509 would cross through the northern part of Redevelopment Area 4 and through the northern part of Redevelopment Area 1.
A50-zoned land	4.6 ac of A50 zoned land in SeeTac would be taken, just west of International Boulevard.	Roughly the same amount of A50 land would be taken as in Alternative C.	Roughly the same amount of A50 and would be taken as in Alternative C.	Roughly the same amount of A50 and would be taken as in Alternative C.
Economic Development Campus	This Alternative would not impact the Economic Development Campus.	Same as Alternative C.	This option would directly impact the northern three-quarters of the 20 ac planned development on the Economic Development Campus.	This option would directly impact the whole 20 ac site for planned development on the Economic Development Campus.
Mobile Home Relocations	Mobile homes: 115 to 214	Mobile Homes: 115 to 214	Mobile homes: 0	Mobile homes: 0
Single Family and Multifamily Relocations	Single Family: 55 du. Multifamily: 157 du.	Single Family: 25 du. Multifamily: 321 du.	Single Family: 145 du. Multifamily: 96 du.	Single Family: 133 Multifamily: 96

TABLE 2
Matrix of Potential Impacts for Alternative C Options

Environmental Features/Constraints	Alternative C		Option 13		Option 21		Option 25	
Business and Other Relocations	Businesses: 13	Other: 1	Businesses: 21	Other: 1	Businesses: 19	Other: 1	Businesses: 13	Other: 1
Noise	401 sensitive receptors would be impacted: <ul style="list-style-type: none"> 13 within 100 feet of roadway 154 between 100 and 200 feet 232 between 200 and 400 feet 		152 sensitive receptors would be impacted: <ul style="list-style-type: none"> 1 within 100 feet of roadway 21 between 100 and 200 feet 130 between 200 and 400 feet 		137 sensitive receptors would be impacted: <ul style="list-style-type: none"> 11 between 100 feet of roadway 30 between 100 and 200 feet 156 between 200 and 400 feet 		177 sensitive receptors would be impacted: <ul style="list-style-type: none"> 1 within 100 feet of roadway 25 between 100 and 200 feet 153 between 200 feet and 400 feet 	
Costs	Construction: \$330M	Acquisition/Relocation: \$60M	Construction: \$300M	Acquisition/Relocation: \$80M	Construction: \$335M	Acquisition/Relocation: \$72M	Construction: \$330M	Acquisition/Relocation: \$75M
	3 extra mobile home park bought: Acquisition/Rel. \$75M	3 extra mobile home park bought: Acquisition/Rel. \$75M	3 extra mobile home park bought: Acquisition/Rel. \$75M	3 extra mobile home park bought: Acquisition/Rel. \$75M	3 extra mobile home park bought: Acquisition/Rel. \$75M	3 extra mobile home park bought: Acquisition/Rel. \$75M	3 extra mobile home park bought: Acquisition/Rel. \$75M	3 extra mobile home park bought: Acquisition/Rel. \$75M
	Preliminary Engineering: \$40M	Preliminary Engineering: \$30M	Preliminary Engineering: \$30M	Preliminary Engineering: \$30M	Preliminary Engineering: \$30M	Preliminary Engineering: \$30M	Preliminary Engineering: \$30M	Preliminary Engineering: \$30M
	Total: \$435M to \$445M	Total: \$435M to \$445M	Total: \$415M to \$435M	Total: \$415M to \$435M	Total: \$440M to \$450M	Total: \$440M to \$450M	Total: \$435M to \$445M	Total: \$435M to \$445M
Geometrics	Sight Distance: Mainline reverse curves		Sight Distance: Good across major corridors		Sight Distance: Same as Alternative C		Sight Distance: Same as Alternative C	
	Horizontal Alignment: Tighter than Option 21 and 25		Horizontal Alignment: Smoother mainline, but many ramps are tight		Horizontal Alignment: Mainline reverse curves, several ramps tight		Horizontal Alignment: Smoother overall than Option 21	
	Vertical Alignment: Difficult, rises originally to be two-level interchange; now is three levels		Vertical Alignment: Smoother mainline, but many ramps are tight		Vertical Alignment: Could be difficult across South 200 th Street		Vertical Alignment: Same as Option 21	
	Intersection Geometrics: Good		Intersection Geometrics: Good		Intersection Geometrics: Tight corridors		Intersection Geometrics: Same as Option 21	

TABLE 3
Matrix of Potential Impacts for Alternative D Options

Environmental Features/Constraints	Alternative D	Option VE-D2
Sector 47 Properties	No direct impacts to Des Moines Creek Park. The SR 509 alignment stays just west of park property and absects park near S 21 st Street in existing right-of-way, crossing over Des Moines Creek Trail. Access points at S 24 th St and S 26 th St would be eliminated. A northward extension of Des Moines Creek Trail would need to cross beneath S 20 th St.	Same as Alternative D.
Historic/Archaeological Resources	No impact.	Same as Alternative D.
Wetlands Streams	<p>14 wetlands would be impacted:</p> <ul style="list-style-type: none"> • 1 Class 1 • 2 "Significant Wetlands" • 3 Class 2 • 3 "Important Wetlands" • 5 Class 3 <p>SR 509 would impact the WW ponds.</p> <p>Alternative D would have 2 crossings of Des Moines Creek and 45 tributaries, ranging from Class 2 to Class 3 or unclassified. 2 crossings of unclassified tributaries of Barnes Creek, crossing of an unclassified reach in the headwaters of Messey Creek.</p>	<p>6 wetlands impacted:</p> <ul style="list-style-type: none"> • 2 "Significant Wetlands" • 2 Class 2 • 3 "Important Wetlands" • 3 Class 3 • 1 unrecorded <p>SR 509 would not impact the WW ponds.</p> <p>Same as Alternative D.</p>
Hazardous Waste Contaminated Sites	Two substantially contaminated sites and twenty reasonably predictable sites may be impacted by the construction of Alternative D.	Same as Alternative D.
OFA Restricted Areas	<p>SR 509 would extend into the western edge of the OAF of the future third runway. The South Access Road would extend southwesterly through the OAF and northern one-third of the OFA/OFA zone of Runway 15L/34R. SR 509 would also dip the southwestern corner of the western OAF of Runway 15L/34R.</p> <p>This Alternative would require a tunnel.</p>	<p>Option VE-D2 would have the same impacts on the third runway restricted zones. SR 509 would cross through the southwest corner of the OAF of Runway 15L/34R. The South Access Road would pass through the eastern edge of the OAF before crossing through the southern one-third of the OFA/OFA zone and merging with SR 509.</p> <p>This Option would likely not require a tunnel.</p>
SASA Site	The South Access Road would not impact the SASA.	The South Access Road would dip the northwest corner of the SASA and cross at its western edge as it travels south.

¹ City of Des Moines Classification

TABLE 1
Matrix of Potential Impacts for Alternative D Options

Environmental Features/Constraints	Alternative D	Option YE-D2																
28 th 24 th Avenue South Arterial Detention Pond	No impact to the detention pond.	Same as Alternative D																
Port of Seattle Redevelopment Areas	SR 509 and South Access Road would occupy most of Redevelopment Area 4 and then merge together through the middle of Redevelopment Area 2. After crossing Des Moines Creek, SR 509 would pass through the middle of Redevelopment Area 2.	SR 509 would pass through the middle of Redevelopment Area 4 and also through the eastern one-third of Redevelopment Area 2. After crossing Des Moines Creek, SR 509 would pass through the middle of Redevelopment Area 2.																
ASU-zoned Land	No ASU-zoned land would be taken.	Same as Alternative D																
Economic Development Campus	This Alternative would have no direct impacts on Economic Development Campus.	Same as Alternative D.																
Mobile Home Relocations	Mobile Homes: 26	Mobile Homes: 26																
Single Family and Multifamily Relocations	Single Family: 73 du. Multifamily: 436 du.	Single Family: 62 du. Multifamily: 409 du.																
Business and Other Relocations	Businesses: 26 Other: 3	Businesses: 26 Other: 3																
Noise	428 sensitive receptors would be impacted <ul style="list-style-type: none"> • 42 within 100 feet of roadway • 113 between 100 and 200 feet • 241 between 200 and 400 feet 	395 sensitive receptors would be impacted <ul style="list-style-type: none"> • 14 within 100 feet of roadway • 69 between 100 and 200 feet • 312 between 200 and 400 feet 																
Costs	<table border="0"> <tr> <td>Construction</td> <td>\$373 million</td> </tr> <tr> <td>Acquisition, Relocation</td> <td>\$72 million</td> </tr> <tr> <td>Preliminary Engineering</td> <td>\$48 million</td> </tr> <tr> <td>Total</td> <td>\$493 million</td> </tr> </table>	Construction	\$373 million	Acquisition, Relocation	\$72 million	Preliminary Engineering	\$48 million	Total	\$493 million	<table border="0"> <tr> <td>Construction</td> <td>\$373 million</td> </tr> <tr> <td>Acquisition, Relocation</td> <td>\$72 million</td> </tr> <tr> <td>Preliminary Engineering</td> <td>\$48 million</td> </tr> <tr> <td>Total</td> <td>\$493 million</td> </tr> </table>	Construction	\$373 million	Acquisition, Relocation	\$72 million	Preliminary Engineering	\$48 million	Total	\$493 million
Construction	\$373 million																	
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Total	\$493 million																	
Construction	\$373 million																	
Acquisition, Relocation	\$72 million																	
Preliminary Engineering	\$48 million																	
Total	\$493 million																	

TABLE 2
 Matrix of Potential Impacts for Alternative D Options

Environmental Features/Constraints	Alternative D	Option YE-D2
Sightlines*	Sight Distance: Good	Sight Distance: Could be an issue, especially
	Horizontal Alignment: Complex interchange, looks are somewhat tight, spot super transition by pond	Horizontal Alignment: Drive superdabot is better than Alternative D spot super transition by pond
	Vertical Alignment: Complex through OPA and by peak	Vertical Alignment: Shows design speed than Alternative D
	Intersection Sightlines: Tight demands	Intersection Sightlines: Good

* Sight studies has been done south of DeWittes Creek since the two alignments are the same

Selection of Options for Further Development

The intent of this White Paper is to determine if any VE Option is superior to its alternative and should, therefore, be substituted for it in the Supplemental Draft EIS. After the initial screening, the remaining options were evaluated against the key environmental criteria. In order to determine if an option was better than the alternative, the Steering Committee had to weigh sometimes conflicting criteria, deciding which were more important than others for purposes of the final screening. For example, an option might displace fewer residences than the alternative, but consequently have higher noise impacts or encroach into a Runway Protection Zone.

At the May 13 and 19, 1999, Steering Committee meetings, a structured decision-making process was conducted, allowing the tradeoffs of criteria to be clearly understood. During those meetings, each criterion was assigned a weight relative to each other. Each option and alternative was then given a cumulative score, based on their performance in all of the weighted criteria. Options were only compared against their alternative of origin. The scores were not intended to reflect absolute values, select the best alignment, or alter the Executive Committee's designation of Alternative C as the Preferred Alternative. Instead they were to highlight which alignments performed better in the environmental criteria used in this White Paper.

Options to Alternative B

Although Option 23's cumulative score was slightly higher than Alternative B, it was determined not to be sufficiently different to merit replacing Alternative B in the Supplemental Draft EIS. Option 23 would impact fewer wetlands and less SASA property, and would be slightly less expensive. These criteria had relatively high weights. Option 23's score in wetlands, the highest rated criterion, was the primary reason it scored better than Alternative B. However, Alternative B would have better geometries and access, impact fewer residences, and would take less parkland. These environmental criteria also had fairly high ratings. To judge between the two, the Steering Committee decided that Option 23's improved treatment of wetlands was not great enough to offset higher impacts to other highly rated criteria. Keeping the better balanced alignment, Alternative B, in the Supplemental DEIS was, therefore, chosen as the most reasonable course of action.

Options to Alternative C

Among the options to Alternative C, the Steering Committee chose to further examine Options 19 and 25. Only Option 21 was dropped from further consideration.

In evaluating the options and alternatives, the Steering Committee considered that Alternative C and Option 19 were similar in their alignments (and avoided the Economic Development Campus), and that Options 21 and 25 were similar in their alignments (and avoided the mobile home parks), and that one from each group should be selected.

Option 19 is a lower cost, better geometrically-functioning version of Alternative C that could be modified to have fewer multifamily relocations. However, Alternative C is the only true Section 4(f) "avoidance alternative," an important quality to the Steering Committee. Despite their similar alignments, they were both forwarded because the Committee believed that it was important to evaluate the fundamental issues associated

with this alignment – one with Section 4(f) impacts and one without – in greater detail at the Supplemental DEIS level.

Options 21 and 25 were also very similar in design, which was reflected in their close evaluation scores. The main difference between them was that Option 25 had lesser impacts to wetlands and had smoother overall geometrics. Performance in these two criteria made Option 25 a significant enough improvement over Option 21 to warrant keeping Option 25. Option 21 was, therefore, eliminated from further consideration.

The Steering Committee recommended that both Options 19 and 25 be modified to avoid key environmental features. Option 19 was to be redefined with a larger curve radius in the northern SR 509 arm in order to reduce the number of mobile home relocations, miss the Northwest Ponds, and minimize impacts on wetlands in the vicinity of the Northwest Ponds. This shift will not affect other environmental criteria. Option 25 was to be shifted slightly north near South 208th Street, lessening impacts to the Economic Development Campus and clipping the corner of the mobile home park, but without increasing Section 4(f) impacts. The Steering Committee considered that this would give Option 25 better balance overall.

Options to Alternative D

Option VE-D2 scored slightly higher than Alternative D. But, because Alternative D and Option VE-D2 were only different in their respective sections north of South 200th Street, differences in individual criteria scores between the two alignments were very small. Alternative D scored better in a few higher-weighted criteria such as wetlands, cost, and displacements. Conversely, Option VE-D2 scored higher in several lower-weighted criteria, ultimately giving it a small overall advantage. The Steering Committee reasoned that the higher-rated criteria were more important to a feasible alignment and that Option VE-D2 did not offer substantial enough advantages to warrant its inclusion in the Supplemental DEIS. Alternative D was selected for continued analysis in the Supplemental DEIS.

Final Selection of Options for Inclusion in the Supplemental Draft EIS

On June 8, 1999, the Steering Committee met to consider the optional alignments in the Alternative C corridor which had been modified in accordance with their earlier direction. They had previously (May 19, 1999) selected Alternatives B and D to carry into the Supplemental Draft EIS, leaving only three alignments to compare: modified Option 19, modified Option 25, and Alternative C. The impacts of the final alignments are summarized in Table 4.

Modified Option 19

The optimization of Option 19 resulted in one less wetland impacted, no impact on the Northwest Ponds, 20 fewer single-family residential relocations, and 144 fewer multi-family residential relocations. There was no change in the impact on Des Moines Creek Park or mobile home relocations. Because of this improvement in impacts, Option 19 was discarded in favor of the modified Option 19.

Instead of substituting the modified Option 19 for Alternative C or another option, the Steering Committee decided to carry it into the Supplemental Draft EIS as a way of sharply defining the tradeoffs involved in the Alternative C corridor. Specifically, the modified Option 19 has high impact to the mobile home park, but low impact to water features and Des Moines Creek Park. The Steering Committee decided that it would be important to disclose this tradeoff in the EIS.

Consequently, modified Option 19 was renamed "Alternative C2" and advanced for detailed analysis in the Supplemental Draft EIS.

Modified Option 25

Relative to Option 25, modified Option 25 avoided impacts to the Economic Development Campus, but clipped the corner of the mobile home park. The Section 4(f) impacts remained the same. By realigning Option 25 slightly north near South 208th Street, the modified Option 25 closely resembled Option 19 in effect. For purposes of evaluating alternatives in the EIS, the Steering Committee reasoned that there was no advantage to analyzing minor variations in alignments that failed to sharply define the environmental issues. Consequently, while it was acknowledged that the modified Option 25 may be a reasonable way to meet the purpose and need for the project and could potentially be selected for development, its impacts could be understood from the analysis of Alternative C and C2.

It was decided that Option 25 more clearly defined the issues and tradeoffs involved in the Alternative C corridor; specifically zero mobile home relocations but high impact on developable lands and other features. Consequently, modified Option 25 was dropped from further consideration and Option 25 was retained for further examination in the EIS. It was renamed "Alternative C3."

Alternative C

The Value Engineering team originally offered conceptual modifications of Alternative C which were intended to lower its cost and some of its impacts, while only slightly intensifying impacts on Des Moines Creek Park. It was presumed that, if accepted, these modifications would become a part of the concept of Alternative C.

Instead, the Steering Committee decided that the modifications (Alternatives C2 and C3) varied so substantially that they should be examined as alternatives in the Supplemental Draft EIS...along with the original concept of Alternative C. The three alignments would adequately represent the range of impacts and alternatives that could be developed in the Alternative C corridor. This acknowledged that Alternative C avoids direct impacts on Des Moines Creek Park, unlike its optional alignments. In combination with Alternatives A (No Action), B, and D, Alternative C, C2 and C3 would describe the range of feasible alternatives for SR 509/South Access Road.

Consequently Alternative C was advanced for further study in the Supplemental Draft EIS and was renamed "Alternative C1."

TABLE 4
Matrix of Potential Impacts of BS Alternatives

Environmental Features/Constraints	Alternative B	Alternative C1	Alternative C2	Alternative C3	Alternative D
Des Moines Creek East Pier Detention Facility		Would reduce the storage capacity of the proposed detention facility by approximately 30 percent.	No impact anticipated.	No impact anticipated.	
267 th Street / Avenue South / Area 4 Detention Pond	SP 525 would impact the whole detention pond.	SP 525 would impact the western portion of the pond.	SP 525 would impact the whole detention pond.	SP 525 would impact the whole detention pond.	No impact to the detention pond.
RAM Restricted Area	SP 525 would approach into the western edge of the CAU of the future third tunnel. The South Access Road would cross parallel, but not encroach, the western edge of the CAU of Runway 15L/34R.	SP 525 would encroach into the western edge of the CAU of the third tunnel and would traverse across the CAU and middle section and the OFA/POFI zone of Runway 15L/34R. The South Access Road would slightly encroach the eastern CAU of Runway 15L/34R.	SP 525 would encroach into the same section of the CAU of the third tunnel as Alternative C1. It would cross the CAU and southern one-third of the OFA/POFI zone of Runway 15L/34R. The South Access Road would approach the western CAU of Runway 15L/34R.	SP 525 would encroach into the same section of the CAU of the third tunnel as Alternative C1. It would cross the CAU and southern one-third of the OFA/POFI zone of Runway 15L/34R. The South Access Road would encroach into the eastern CAU of Runway 15L/34R (mirroring Alternative C1).	SP 525 would encroach into the western edge of the CAU of the future third tunnel. The South Access Road would extend southwesterly through the CAU and northern one-third of the OFA/POFI zone of Runway 15L/34R. SP 525 would also hit the southwestern corner of the western CAU of Runway 15L/34R.
	The alternative would not require a tunnel.	The alternative would require a tunnel.	The alternative would also not require a tunnel.	The alternative would wish to require a tunnel.	The alternative would require a tunnel.
SASA Site	The South Access Road would hit the northwest corner of the SASA and extend along and encroach into the western edge of the SASA.	The South Access Road would hit the northwest corner of the SASA and extend along and encroach into the western edge of the SASA.	South Access Road's extent would be further western, resulting in less impacts to the SASA.	South Access Road's extent would be further western, resulting in less impacts to the SASA.	The South Access Road would not impact the SASA.
ABC Office and Economic Development Campus	1.4 AC of ABC Office and 1.567 AC would be taken at SP 525 crossing toward International Boulevard.	1.5 AC of ABC Office and 1.567 AC would be taken, east west of International Boulevard.	Roughly the same amount of ABC Office and would be taken as in Alternative C1.	Roughly the same amount of ABC Office and would be taken as in Alternative C1.	No ABC Office and would be taken.
	The alternative would not impact the Economic Development Campus.	The alternative would have no direct impacts on the Economic Development Campus.	Same as Alternative C1.	The alternative would directly impact the area of the site of planned development of the Economic Development Campus.	The alternative would have no direct impacts on the Economic Development Campus.
Mobile Home Relocations	Mobile Homes: 1	Mobile Homes: 115 to 214	Mobile Homes: 115 to 214	Mobile Homes: 1	Mobile Homes: 25

TABLE 4
Matrix of Potential Impacts of ES Alternatives

Environmental Features/Constraints	Alternative B	Alternative C ¹	Alternative C2	Alternative C3	Alternative C ²
Section 4(f) Properties	<p>SP 525 would cross Des Moines Creek Park in its narrowest point taking a most approximately 0.8 acres of the park.</p> <p>Crossing of S 200th Street on Des Moines Creek Trail in its expanded northern end could be more difficult to accomplish and possibly cut in the increased width of S 200th Street.</p>	<p>No direct impacts to Des Moines Creek Park. The alignment would skirt Des Moines Creek Park in its northern corner.</p> <p>The Des Moines Creek Trail in its expanded northern end would need to cross between S 200th Street and SP 525 via an underpass or bridge.</p>	<p>SP 525 would skip the northern corner of Des Moines Creek Park taking a most approximately 1.3 acres of the park. Roadways would cross through the park parking lot and the head area.</p> <p>The presence of the SP 525/South Access Road interchange may obstruct northern extension of the Des Moines Creek Trail.</p>	<p>SP 525 would skip the northern corner of Des Moines Creek Park taking a most approximately 0.8 acres of the park. Roadways would cross through the park parking lot and the head area.</p> <p>The presence of the SP 525/South Access Road interchange may obstruct northern extension of the Des Moines Creek Trail.</p>	<p>No direct impacts to Des Moines Creek Park. The SP 525 alignment would skirt its west of park property and adjacent park near SP 217th Street. The existing north-south crossing over Des Moines Creek Trail Access points at S 204th St and S 208th St would be eliminated.</p> <p>A northern extension of Des Moines Creek Trail would need to cross between S 200th St.</p>
Wetlands/Sensitive	<p>4 wetlands (117 acres) would be impacted:</p> <ul style="list-style-type: none"> • 1 Class I • 1 "Significant Wetland" • 1 Class II • 1 Class III <p>SP 525 would impact the WA zones.</p> <p>3 crossings of Des Moines Creek and its tributaries ranging from Class II to unclassified.</p>	<p>7 wetlands (117 acres) would be impacted:</p> <ul style="list-style-type: none"> • 1 Class I • 4 Class II • 2 Class III <p>SP 525 would not impact the WA zones.</p> <p>4 crossings of Des Moines Creek and its tributaries ranging from Class II to unclassified.</p>	<p>7 wetlands (117 acres) would be impacted:</p> <ul style="list-style-type: none"> • 1 Class I • 2 Class II • 4 Unfragmented <p>Same as Alternative C¹.</p> <p>Same as Alternative C¹.</p>	<p>7 wetlands (117 acres) would be impacted:</p> <ul style="list-style-type: none"> • 1 Class I • 4 Class II • 2 Unfragmented <p>Same as Alternative C¹.</p> <p>Same as Alternative C¹.</p>	<p>4 wetlands (117 acres) would be impacted:</p> <ul style="list-style-type: none"> • 1 Class I • 1 "Significant Wetland" • 1 Class II • 1 "Important Wetland" • 1 Class III <p>SP 525 would impact the WA zones.</p> <p>Alternative C² would have 4 crossings of Des Moines Creek and its tributaries ranging from Class II to Class I or unclassified. 3 crossings of unclassified tributaries of Barnes Creek, 1 crossing of an unclassified reach of the tributaries of Barnes Creek.</p>

¹ C¹ = Des Moines Trail variant

TABLE 1
Matrix of Potential Impacts of ES Alternatives

Environmental Features/Constraints	Alternative B	Alternative C ¹	Alternative C2	Alternative C3	Alternative D
Single Family and Multi-unit Residences	Single Family: 1,000 Multi-unit: 200	Single Family: 800 Multi-unit: 150	Single Family: 750 Multi-unit: 150	Single Family: 750 Multi-unit: 80	Single Family: 750 Multi-unit: 400
Business Residences	Business: 20	Business: 10	Business: 10	Business: 10	Business: 20
Trees	366 sensitive receptors would be impacted: <ul style="list-style-type: none"> • 10 within 100 feet of roadway • 177 between 100 and 200 feet • 249 between 200 and 400 feet 	407 sensitive receptors would be impacted: <ul style="list-style-type: none"> • 10 within 100 feet of roadway • 154 between 100 and 200 feet • 239 between 200 and 400 feet 	328 sensitive receptors would be impacted: <ul style="list-style-type: none"> • 30 within 100 feet of roadway • 171 between 100 and 200 feet • 144 between 200 and 400 feet 	177 sensitive receptors would be impacted: <ul style="list-style-type: none"> • 7 within 100 feet of roadway • 25 between 100 and 200 feet • 135 between 200 feet and 400 feet 	420 sensitive receptors would be impacted: <ul style="list-style-type: none"> • 66 within 100 feet of roadway • 118 between 100 and 200 feet • 247 between 200 and 400 feet
Costs	<ul style="list-style-type: none"> Construction: \$20M Acquisition/Relocation: \$5M Professional Engineering: \$1M Total: \$26M 	<ul style="list-style-type: none"> Construction: \$20M Acquisition/Relocation: \$5M Professional Engineering: \$1M Total: \$26M + 0.5M = \$26.5M 	<ul style="list-style-type: none"> Construction: \$15M Acquisition/Relocation: \$5M Professional Engineering: \$1M Total: \$21M + 0.5M = \$21.5M 	<ul style="list-style-type: none"> Construction: \$20M Acquisition/Relocation: \$6M Professional Engineering: \$1M Total: \$27M 	<ul style="list-style-type: none"> Construction: \$20M Acquisition/Relocation: \$5M Professional Engineering: \$1M Total: \$26M

Summary of the Outcome of Screening the Value Engineering Alignment Recommendations

A Washington State Department of Transportation Value Engineering Team convened the week of February 8-12, 1999. The team considered whether the alternative alignments of SR 509/South Access Road could be improved by changing some of the constraints placed on their original development. Over the following months, several iterations were developed and evaluated which met the objectives defined by the Value Engineering Team. The result was a set of alternatives which could be carried into the SR 509/South Access Road Supplemental Draft EIS to represent the range of feasible project alternatives.

The alternatives selected by the Steering Committee for detailed evaluation in the EIS were:

- Alternative A (No Action) - this alternative remained unchanged over the duration of the review
- Alternative B - the configuration of this alternative remained as it was described in the February 1999 Discipline Reports.
- Alternative C (C1) - the configuration of Alternative C remained as it was described in the February 1999 Discipline Reports, except that the right-of-way was narrowed on the south end by adding retaining walls. This alternative was renamed "Alternative C1."
- Option 19 (Alternative C2) - this optional alignment within the Alternative C corridor was modified and renamed "Alternative C2."
- Option 25 (Alternative C3) - this optional alignment within the Alternative C corridor was modified further, but the modification was rejected in favor of the original Option 25. It was then renamed "Alternative C3."
- Alternative D - the configuration of this alternative remained as it was described in the February 1999 Discipline Reports.