APPENDIX O

Design Options Considered but Withdrawn
Appendix O: Design Options Considered but Withdrawn

This appendix provides the Tier 2 DEIS discussion of design options considered but withdrawn referenced in Section 2.3 of the Tier 2 FEIS.

DESIGN OPTIONS CONSIDERED BUT WITHDRAWN

Typically, this section of a DEIS includes a discussion of alternatives that have been withdrawn. However, the Tier 1 process identified a single Build Alternative to be carried forward in Tier 2. The Tier 2 Build Alternative includes design options and local circulation options. Therefore, this section includes a discussion of the design options that have been withdrawn.

In several instances, the design options considered but withdrawn used more EFU land than the segments and design options evaluated in this document. Preservation of EFU land is an important statewide land use-planning goal. As good environmental stewards, ODOT has strived to preserve agricultural resources where practicable. In working towards this objective, ODOT considered the amount of EFU land each design option used as an important criterion for withdrawing design options. Therefore, it is noted below where the amount of EFU land that the design option used was a major factor in dismissing a design option.

For additional detail on design options withdrawn, and for a description of the local circulation options withdrawn, refer to the Newberg Dundee Bypass Alternatives Screening Report, September 19, 2006. The report gives a detailed description of the process used to identify, develop, and screen the design options and local circulation options. It includes maps and figures of all design options and local circulation options that were considered for the Tier 2 DEIS.

Segment 1: Dayton Interchange

Directional Interchange, (Design Option 1.1)

Design Option 1.1 was a directional interchange that allowed free-flow traffic to and from the Bypass, Oregon 99W, and Oregon 18. This interchange design included a structure up to 57 feet tall.

ODOT withdrew the directional interchange design option because, when compared to the proposed partial cloverleaf Dayton Interchange (formerly identified as Design Option 1.7) that is currently being evaluated, the directional interchange:

- Used three times as much EFU land outside of the Corridor.
- Impacted more than four times the amount of wetlands acres.
- Impacted more than twice the amount of wildlife habitat acres.
Had visual impacts, due to height of embankments and structures that were unacceptable.

Required the purchase of over twice as much new right-of-way.

Had right-of-way costs that were three times as much.

Had construction costs were three times as much.

**Partial Cloverleaf A-B Interchange, (Design Option 1.2)**

Partial Cloverleaf A-B Interchange, Design Option 1.2, was a partial cloverleaf interchange with entrance and exit ramps in the southeast and northeast quadrants.

ODOT withdrew this design option because, when compared to the proposed Dayton Interchange, the Partial Cloverleaf A-B Interchange:

- Used twice as much EFU land outside of the Corridor on both the north and south sides of the Corridor.
- Required relocation of one residence.
- Did not have traffic free-flow movement from Oregon 99W to the Bypass.
- Had the lowest traffic operation efficiency of interchange design options analyzed in Segment 1.
- Impacted more than three times the amount of wetlands acres.
- Included three overpass structures, increasing bridge construction costs by at least 30%.

**Partial Cloverleaf A Interchange (Centered), (Design Option 1.3)**

Partial Cloverleaf A Interchange (Centered), Design Option 1.3, was an interchange design with a single loop ramp servicing northbound Oregon 99W traffic to the Bypass. This option maintained free flow movement to/from the Bypass and Oregon 18, and to/from the Bypass and Oregon 99W. The interchange had two-way stop-controlled intersections at the northbound and southbound off-ramp terminal. Southbound movement from the Bypass to Oregon 99W was yield-controlled. In addition, the north leg of Oregon 99W was realigned to a stop-controlled “T” intersection with the connector roadway (the south leg of Oregon 99W) that accesses the interchange. One structure was needed to cross over the Bypass and the railroad. This design option extended outside of the Corridor.

ODOT withdrew this design option because, when compared to the proposed Dayton Interchange, the Design Partial Cloverleaf A Interchange (Centered):

- Included limited travel speeds on the overcrossing structure and ramps because of roadway design.
- Did not meet the access spacing standard of 1,320 feet between the westbound Bypass terminal and the intersection with the northern leg of Oregon 99W.
- Required relocation of two businesses.

**Partial Cloverleaf A Interchange (East), (Design Option 1.4)**

Partial Cloverleaf A Interchange (East), Design Option 1.4 is similar to Partial Cloverleaf A Interchange (Centered), Design Option 1.3, with a single loop ramp servicing northbound Oregon 99W traffic to the Bypass. It had the same characteristics as Design
Option 1.3 except this design option relocated the “T” intersection with the north leg of Oregon 99W to the east to achieve the desired access spacing of 1,320 feet. This design option also extended outside of the Corridor and required one structure to cross over the Bypass and the railroad.

ODOT withdrew this design option because, when compared to the proposed Dayton, Interchange, the Partial Cloverleaf A Interchange (East):

- Included limited travel speeds on the overcrossing structure and ramps because of roadway design.
- Required relocation of two businesses.

Partial Cloverleaf A Interchange (West), (Design Option 1.5)

Partial Cloverleaf A Interchange (West), Design Option 1.5, was similar to Design Options 1.3 and 1.4, with a single loop ramp servicing northbound Oregon 99W traffic to the Bypass. It had the same characteristics as these design options except this design option shifted the interchange to the southwest and required the connector roadway to cross through existing western industrial businesses. In addition the north leg of Oregon 99W was realigned to intersect with the connector roadway at a stop-controlled intersection. This interchange design option required two structures to cross over the Bypass and the railroad. In comparison to Design Options 1.3 and 1.4, this design option provided for a higher speed transition for southbound traffic from the Bypass to Oregon 99W. Design Option 1.5 extended outside of the Corridor.

ODOT withdrew this design option because, when compared to the proposed Dayton Interchange, the Partial Cloverleaf A Interchange (West):

- Included limited travel speeds on the overcrossing structure and ramps because of roadway design.
- Required relocation of two businesses.
- Used twice as much EFU land outside of the Corridor for the extension of Kreder Road to the Dayton UGB.

Partial Cloverleaf A Interchange (Centered), (Design Option 1.6)

Partial Cloverleaf A Interchange (Centered), Design Option 1.6, was similar to Design Options 1.3, 1.4 and 1.5, with a single loop ramp servicing northbound Oregon 99W traffic to the Bypass. It had the similar characteristics as those design options except for the location of the connector roadway from Oregon 99W to the interchange. The connector roadway remained above-grade and required a structure over the railroad and the Oregon 99W/north leg. This leg of Oregon 99W was connected to the interchange at the connector road with a stop-controlled intersection. Motorists traveling north-south along Oregon 99W would have made a turning movement at this intersection. Design Option 1.6 avoided businesses in the northern industrial area, but extended outside of the Corridor north of Oregon 99W. This option required three structures, over the Bypass, the railroad, and Oregon 99W.

ODOT withdrew this design option because, when compared to the proposed Dayton Interchange, the Partial Cloverleaf A Interchange (Centered):

- Used twice as much EFU land outside of the Corridor on both the north and south sides of the Corridor, and north of Oregon 99W.
- Impacted more than four times the amount of wetlands acres.
Included three overpass structures, increasing bridge construction costs by at least 30%.

Segment 2: Dayton Interchange to Dundee UGB

Design Option 2.2

Design Option 2.2 began east of the Dayton Interchange where the interchange ramps connected with the Bypass. This design option was at-grade with a wide median landscaped with trees.

ODOT withdrew this design option because, when compared to the Bypass design in Segment 2 (formerly identified as Design Option 2.1) that is currently being evaluated, Design Option 2.2:

- Had a median width of 118 feet, which was 76 feet wider and required purchase of 12 more acres of EFU land, than the 42-foot-wide median proposed in Segment 2.
- Had higher right-of-way costs due to the wider median.

Segment 3: Dundee UGB to East Dundee Interchange

Design Option 3.C

Design Option 3.C was inside the Corridor and within the Dundee UGB. The Bypass was fully depressed (approximately 23 feet below grade). To fully depress the roadway, permanent dewatering wells would have been required to maintain groundwater levels below pavement levels. Side slope cuts were also required. Impacts to adjacent properties due to dewatering could have included building settlement, damage to existing buildings, reductions in existing domestic/agricultural well yields, and failure of existing shallow wells.

ODOT withdrew this design option because, when compared to the Segment 3 design options currently being evaluated, Design Option 3.C:

- Required side slopes that would have impacted more agricultural land and land within Dundee UGB (more than Design Options 3.A and 3.B).
- Had higher construction costs due to excavation, installation of permanent dewatering wells and long-term operation and maintenance of dewatering system. Construction costs estimated at approximately 10 times the cost of at-grade construction (as compared to Design Option 3.B).
- Potentially impacted neighboring private wells and structures due to permanent dewatering.

Segment 4: East Dundee Interchange

No design options were withdrawn from Segment 4.

Segment 5: West Newberg to Oregon 219 Interchange

Design Option 5.1A.2

In Design Option 5.1A.2 the Bypass was above-grade (on a fill) from just east of Chehalem Creek, passing over College and River Streets and the railroad. The Bypass transitioned to at-grade and then to below-grade after Mill Street, crossed Hess Creek in
a low vertical profile in order to be below the projected flight paths south of the Sportsman Airpark and continued depressed through the Oregon 219 Interchange. This design option displaced residences near 11th Street and impacted the north portion of SP Newsprint. The depressed Bypass also created the risk of groundwater contamination from SP Newsprint operations.

ODOT withdrew this design option because, when compared to the Segment 5 design options currently being evaluated, Design Option 5.1A.2:

- Required higher cost construction (about 20 times the cost of at-grade road construction) for the 2000 foot section of fully depressed Bypass north of SP Newsprint, including creating an impermeable barrier and seals in order to construct the highway inside a protective “bathtub”. This would eliminate the need for ground water quality mitigation to address groundwater that could be contaminated from plant operations.

**Design Option 5.1B.2**

In Design Option 5.1B.2 the Bypass was fully depressed under College and River Streets and the railroad. 11th Street was closed between Columbia Street and Wynooski Street. The Bypass continued fully depressed between Chehalem Street and Wynooski Road, crossed the Hess Creek North ravine in a low profile under the projected flight paths south of the Sportsman Airpark, and continued depressed through the Oregon 219 Interchange. This design option displaced residences bordering 11th Street and required permanent dewatering wells for the depressed portions of the Bypass. Impacts to adjacent properties due to dewatering could have included building settlement, damage to existing buildings, reductions in existing domestic/agricultural well yields, and failure of existing shallow wells.

ODOT withdrew this design option because, when compared to the Segment 5 design options currently being evaluated, Design Option 5.1B.2:

- Had higher construction cost (about 10 times the cost for at-grade road construction) for the 2000-foot section of fully depressed Bypass west of SP Newsprint beneath College and River Streets and the railroad due to installation of permanent dewatering wells and to provide long-term operation and maintenance.

- Required higher cost construction (about 20 times the cost of at-grade road construction) for the 2800-foot section of fully depressed Bypass north of SP Newsprint, including creating an impermeable barrier and seals in order to construct the highway inside a protective “bathtub”. This would eliminate the need for ground water quality mitigation to address groundwater that could be contaminated from plant operations.

**Design Option 5.2C**

In Design Option 5.2C the Bypass was shifted farther south onto SP Newsprint property to keep 11th Street open between Columbia Street and Wynooski Road. The Bypass was fully depressed under College and River Streets and the railroad. East of Willamette Street, the Bypass changed to at-grade between Chehalem Street and Wynooski Road, and then crossed the Hess Creek North ravine in a low profile under the projected flight paths south of the Sportsman Airpark. The Bypass remained partially depressed through the Oregon 219 Interchange, requiring permanent dewatering wells. Impacts to adjacent properties due to dewatering could have included building settlement, damage to existing buildings, reductions in existing domestic/agricultural well yields, and failure of existing shallow wells.
ODOT withdrew this design option because, when compared to the Segment 5 design options currently being evaluated, Design Option 5.2C:

- Required higher construction cost (about 10 times the cost for at-grade road construction) for the 2000-foot section of fully depressed Bypass west of SP Newsprint due to required permanent dewatering wells and to provide long-term operation and maintenance.

Segment 6: Oregon 219 Interchange

Partial Cloverleaf A-B (West) Interchange, (Design Option 6.2)

Partial Cloverleaf A-B (West) Interchange, Design Option 6.2, was an interchange with ramps located in the northwest and southwest quadrants of the interchange. This design option minimized impacts to the developable vacant (agricultural) property in the southeast quadrant of the interchange. However, it impacted residences in the southwest quadrant and required left turns of high-volume traffic that reduced mobility and safety levels.

ODOT withdrew the Partial Cloverleaf A-B (West) Interchange because, when compared to the Oregon 219 Interchange (formerly identified as Design Option 6.1), Design Option 6.2:

- Displaced over twenty residences located west of Oregon 219.
- Required eastbound Bypass traffic heading toward downtown Newberg to make a left turn at the eastbound ramp terminal. This movement resulted in less efficient traffic operations at the ramp intersection, unacceptable traffic operations at this signalized intersection, and reduced mobility and safety levels.
- Lowered ramp terminal capacities because of higher volume left-turn movements to and from Oregon 219. Does not meet OHP Mobility Standards (v/c ratio=0.80).

Partial Cloverleaf A-B (East) Interchange, (Design Option 6.3)

Partial Cloverleaf A-B (East), Design Option 6.3, was a partial cloverleaf interchange with ramps in the southeast and northeast quadrants of the interchange. The southbound Oregon 219-to-westbound Bypass movement was required to make a left-turn movement. This interchange preserved land zoned for industrial development in the northwest interchange quadrant and minimized impacts to residential lands in the southwest quadrant of the interchange.

ODOT withdrew this Partial Cloverleaf A-B (East) Interchange option because, when compared to the Oregon 219 Interchange Design Option 6.3:

- Displaced more than five additional residences in the northeast quadrant.
- Operated inefficiently (the lowest operational efficiency of all Segment 6 design options) due to high volume traffic making left-turn movements at the ramp intersections.
- Lowered ramp terminal capacities because of higher volume left-turn movements to and from Oregon 219. Does not meet OHP Mobility Standards (v/c ratio=0.80).

Tight Urban Diamond Interchange, (Design Option 6.4)

Tight Urban Diamond Interchange, Design Option 6.4, was an interchange with off-ramps preceding the overpass in all directions. It differed from conventional diamonds in that ramp termini were spaced closer together, providing a smaller interchange footprint. This
configuration allowed the ramp termini intersections to operate in coordination or as a single-signal system. This design option created land use impacts and required right-of-way acquisition in all four quadrants of the interchange. However, a tight urban interchange had better operational efficiency when compared to the partial cloverleaf (east) interchange.

ODOT withdrew this Tight Urban Diamond Interchange option because, when compared to the Oregon 219 Interchange Design Option 6.4:

- Impacted all four interchange quadrants, including the highly developed northeast and southwest quadrants.
- Displaced over 15 additional residences in the northeast and southwest quadrants.
- Required higher volume of traffic to make left turns.

**Single-Point Urban Interchange, (Design Option 6.5)**

Single-Point Urban Interchange, Design Option 6.5, was an interchange characterized by a central intersection servicing both left turn off-ramp movements. Right turns were removed from the signalized central intersection as yield-controlled maneuvers prior to the signal. Single-point urban interchange forms are typically used where there is limited right-of-way, and retaining walls are often used to further reduce the size of the interchange footprint. Single-point urban interchanges also require larger bridge structures.

ODOT withdrew this Single-Point Urban Interchange option because, when compared to the Oregon 219 Interchange, Design Option 6.5:

- Impacted all four interchange quadrants, including the highly developed northeast and southwest quadrants.
- Displaced over 15 additional residences in the northeast and southwest quadrants.
- Required higher volume of traffic to make left turns.
- Had higher cost due to a larger bridge structure and retaining walls.

**Partial Cloverleaf A (1-Quadrant) Interchange, (Design Option 6.6)**

Partial Cloverleaf A (1-Quadrant) Interchange, Design Option 6.6, was a partial cloverleaf interchange with ramps in the southeast, southwest, and northeast quadrants of the interchange. This design option had direct impacts to existing industrial and commercial development in three quadrants.

ODOT withdrew this Partial Cloverleaf A (1-Quadrant) Interchange option because, when compared to the Oregon 219 Interchange, Design Option 6.6:

- Displaced over 15 additional residences in the northeast and southwest quadrants.
- Required higher volume of traffic to make left turns.
- Lowered ramp terminal capacities because of higher volume left-turn movements to and from Oregon 219. Does not meet OHP Mobility Standards (v/c ratio is 0.80).

**Diamond Interchange (with Potential Expansion for Loop Ramps), (Design Option 6.7)**

Diamond Interchange (with Potential Expansion for Loop Ramps), Design Option 6.7, was a diamond interchange with ramp intersections that were further from the Bypass, increasing the size of the footprint over that of the tight urban diamond. This expanded
footprint increased impacts in all four quadrants of the interchange and had higher construction costs.

ODOT withdrew this Diamond Interchange (with Potential Expansion for Loop Ramps) option because, when compared to the Oregon 219 Interchange, Design Option 6.7:

- Impacted all four interchange quadrants, including the highly developed northeast and southwest quadrants.
- Displaced over 25 additional residences in the northeast and southwest quadrants. The most residential displacements of any Segment 6 design option.
- Required higher volume of traffic to make left turns.

Segment 7: East Newberg to East Newberg Interchange

All of the following design options began east of the Oregon 219 Interchange where the interchange ramps connected with the Bypass and continued to the East Newberg Interchange.

Design Option 7.1A

Design Option 7.1A avoided impacts to the Chehalem Parks and Recreation District (CPRD) golf course hole 2 immediately east of the Corridor but impacted a portion of the CPRD golf course south of Fernwood, which would be a potential 4(f) use de minimis impact. The Bypass was fully depressed under Fernwood Road, which stayed in the same location, but was on a new bridge. Permanent dewatering wells were required for the depressed roadway section. Impacts to adjacent properties due to dewatering could have included building settlement, damage to existing buildings, reductions in existing domestic/agricultural well yields, and failure of existing shallow wells.

ODOT withdrew this design option because, when compared to Segment 7 design options currently being evaluated, Design Option 7.1A:

- Required higher construction costs to excavate area and haul away and dispose of materials for the 2200-foot section of fully depressed Bypass under Fernwood Road, (about 10 times the cost of at-grade road construction), to install permanent dewatering wells, and to provide long-term operation and maintenance of the facility.

Design Option 7.1B

Design Option 7.1B avoided impacts to the CPRD golf course hole 2 immediately east of the Corridor but impacted a portion of the CPRD golf course south of Fernwood, which would be a potential 4(f) use de minimis impact. The Bypass was on a structure over Fernwood Road.

ODOT withdrew this design option because, when compared to Segment 7 design options currently being evaluated, Design Option 7.1B:

- Required 25-foot-high approach embankments at the Fernwood Road overcrossing that could have impacted views (residential and general views).
- Had a greater potential for noise impacts due to higher overcrossing at Fernwood Road.

Design Option 7.1C

In Design Option 7.1C the Bypass was semi-depressed in the vicinity of Fernwood Road. Fernwood Road was raised about 12 feet on a bridge. A gravity trench drain system could have been needed to provide permanent dewatering for the semi-depressed areas
of the Bypass. Impacts to adjacent properties due to dewatering could have included building settlement, damage to existing buildings, reductions in existing domestic/agricultural well yields, and failure of existing shallow wells.

ODOT withdrew this design option because, when compared to Segment 7 design options currently being evaluated, Design Option 7.1C:

- Had higher construction costs for the semi-depressed section of the Bypass under Fernwood Road, (about 2 times the cost of at-grade road construction) for a permanent gravity trench drain system.
- Impacted residential property, with embankments or retaining walls, near the Brutscher Street and Fernwood Road intersection.

**Design Option 7.2A**

Design Option 7.2A impacted the northwest corner of the CPRD golf course immediately east of the Corridor. The Bypass was fully depressed under Fernwood Road, which stayed in the same location, but on a new bridge. Permanent dewatering wells were required for the depressed section of the Bypass. Impacts to adjacent properties due to dewatering could have included building settlement, damage to existing buildings, reductions in existing domestic/agricultural well yields, and failure of existing shallow wells.

ODOT withdrew this design option because, when compared to Segment 7 design options currently being evaluated, Design Option 7.2A:

- Required higher construction cost to excavate area and haul away and dispose of materials for the 2200-foot section of fully depressed Bypass under Fernwood Road, (about 10 times the cost of at-grade road construction), to install permanent dewatering wells, and to provide long-term operation and maintenance of the facility.

**Design Option 7.2B**

Design Option 7.2B impacted the northwest corner of the CPRD golf course, immediately east of the Corridor. The only difference between Design Options 7.2A and 7.2B was that Design Option 7.2B required a raised-grade crossing for the Bypass over Fernwood Road. Approach embankments up to 25 feet high would be required for the Bypass.

ODOT withdrew this design option because, when compared to Segment 7 design options currently being evaluated, Design Option 7.2B:

- Required 25-foot-high approach embankments at the Fernwood Road overcrossing that impact residential views and general views.
- Had a greater potential for noise impacts due to higher overcrossing at Fernwood Road.

**Segment 8.1: East Newberg Interchange and Segment 8.1A: Rex Hill**

No design options were withdrawn from Segment 8.1 or Segment 8.1A.
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