Technical Memorandum

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Salem River Crossing Project Construction Activities and Impacts

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This technical report includes a general description of the construction impacts for each build alternative in the Salem River Crossing Draft Environmental Impact Statement (DEIS). It focuses on an evaluation of the relative impacts of the construction of each build alternative to the surrounding transportation system and land uses. This evaluation of construction impacts is based on conceptual design work completed to date and is intended to provide information necessary to differentiate among alternatives.

A general description of each alternative is included in each section to aid the reviewer in understanding the evaluations included herein. A table containing a detailed technical comparison of construction and project cost elements for each alternative is provided in Attachment A of this report. A table containing an itemization of the total project cost estimate is provided in Attachment B of this report. Design drawings showing plan and elevation and foundation locations for each alternative are provided in Attachment C of this report.

Based on preliminary cost data assembled for the project, construction cost estimates were prepared for each build alternative. These estimates are based on conceptual design level data and will provide a basis for cost comparisons between the alternatives. Additional, more detailed cost data will be available following the preliminary design of the preferred alternative.

Executive Summary

Construction impacts have been evaluated based on a general understanding of the construction staging requirements for each Build alternative. The evaluation assumed that the entire project was funded and would be constructed at one time, not phased in over many years with several smaller projects. This approach was the basis of the project duration estimates for each Build alternative. The impacts to

traffic and land use on each side of the Willamette River are discussed relative to each alternative.

The highest level of estimated construction impacts are associated Alternative 2A due to the significant amount of modifications that need to be made to road system infrastructure in the vicinity of the existing bridges. Alternative 2A has the difficult challenge of widening or re-constructing major portions of OR 22 and Wallace Road while simultaneously accommodating traffic, which is already at high levels of congestion. The effects of this construction would cause major impacts to regional and local traffic while also significantly affecting downtown Salem.

The lowest level of estimated construction impacts are associated with Alternative 4A because the new crossing location is north of downtown and construction of the alternative entails making relatively simple bridge connections on each side of the river.

Overall estimated levels of construction impacts associated with all Build alternatives are summarized in Table 1.

Table 1: Summary of Estimated Construction Impacts

Alternative	East-side Impacts	West-side Impacts	OR 22 Impacts	Overall Ranking
2A	Medium	High	High	Highest
2B	High	Medium	High	High
3	High	Low	None	Medium
4A	Medium	Low	None	Low
4B	Medium	High	High	Highest
4C	High	Medium	High	High
4D	High	Medium	High	High
4E	High	Medium	High	High

One item to note is that the level of construction impact noted above also influences the project cost estimates. If the construction impact is high, the cost of construction in this area is relatively higher as well. This relative cost difference is captured in the project cost estimates.

There are several mitigation measures that can reduce the construction impacts noted in this report. Mitigation is discussed at the end of the report.

Alternative 2A

Alternative 2A includes making modifications to the existing bridges through "widening". In the eastbound direction, the Center Street Bridge would be widened by reconfiguring the usable deck area. The deck would be modified to increase the traffic capacity of the river crossing from four travel lanes to five travel lanes. Space

for the additional travel lane would come from elimination of the existing multi-use path, reconstruction of the bridge rail, and strengthening of the outer portions of the deck underneath the bridge rail. This deck modification does not require new piers in the river. In the westbound direction, widening of the Marion Street Bridge would be accomplished by constructing a new structure alongside the existing Marion Street Bridge to increase the traffic capacity of the river crossing. The new structure would add two additional travel lanes to the existing four travel lanes for a total of six travel lanes.

The estimated total project cost of Alternative 2A is $148 million (in 2015 dollars). Alternative 2A would take approximately 2 years to construct.

Impacts on East Side of Willamette River

Alternative 2A entails the construction of major intersection modifications on Commercial and Marion Streets at the east-side bridgehead. This is a key modification that would increase the carrying capacity of the southbound-to-westbound turning movement in conjunction with the new westbound travel lanes on the Marion Street Bridge noted earlier. This work would require reconstruction of the busiest intersection in downtown Salem during the afternoon rush hour. Construction work at this intersection would entail lane closures and would need to be performed while simultaneously accommodating traffic, since there would be no alternate routes for vehicles during construction. This would be a significant impact to the mobility of both regional and local westbound traffic for one construction season. Congestion would be increased in the downtown area, which could have a negative overall impact on the commercial core of the city.

Impacts on West Side of Willamette River

Alternative 2A includes many major modifications on the west side of the river. The primary modification entails major revisions to the west-side bridgehead for the purpose of integrating new travel lanes on the existing bridges (described earlier) with new connections to OR 22, Wallace Road, Marine Drive, and the interchange at Rosemont Avenue. Modifications on the west side would take at least 2-3 construction seasons to complete. The work would require several stages of construction to widen, construct, or re-construct the ramp connections, including traffic switches, and lane closures. Opportunities to construct temporary facilities to carry traffic are nonexistent due to the challenge of bridgehead connections on both sides of the river.

Alternative 2A includes widening Wallace Road from four to six travel lanes and constructing major intersection modifications at Glen Creek Road and Orchard Heights Road. Traffic impacts on the OR 22 and Wallace Road corridors would be high for both regional and local travelers throughout the construction period for both directions of traffic – the already congested transportation network in and

through West Salem would worsen. This increased congestion would result in increased travel delays to the downtown area on the east side.

Overall, the construction of Alternative 2A would cause longer commute times and significant negative impacts to businesses on both sides of the river in, and beyond, the project area.

Alternative 2B

Alternative 2B includes a new river crossing located just south of the Union Street Railroad Bridge. The new bridge would be five lanes wide – three eastbound and two westbound. On the east side of the Willamette River, the major connection would be to the Commercial-Liberty Street couplet located just north of Division Street. Several downtown streets would be reconfigured south of the new bridge, including Commercial and Front streets.

On the west side of the river, the new bridge would have ramp connections to Marine Drive to the north and a primary connection to OR 22 to the south. This alternative would also include widening modifications to Glen Creek Road and Wallace Road as well as the construction of Marine Drive from the new bridge to Orchard Heights Road.

The estimated total project cost of Alternative 2B is $388 million (in 2015 dollars). Alternative 2B would take approximately 3 years to construct.

Impacts on East Side of Willamette River

Construction of the east-side bridge approach would require temporary re-routing of a short section of the Commercial-Liberty Street couplet for two construction seasons. This couplet carries three lanes of traffic southbound and two lanes northbound in this section. Re-routing the high volume of traffic from the couplet would cause significant mobility impacts for traffic going to or from the downtown area (and OR 22) via the Salem Parkway. Alternate routes for north-south travel include Broadway Avenue and Front Street, but neither has adequate capacity to accommodate the estimated level of additional peak-period commuter traffic. The reconfiguring of various streets in the vicinity would require minor roadway modifications such as widening, narrowing, traffic signal revisions, and re-striping. The traffic impacts of this work would be relatively minor; however, the impact on properties in the area, and specifically on those that front a street that would be reconfigured, could be very high. Impacts may include temporary or permanent loss of on-street parking. The reconfiguration of various city streets in the downtown area would only take one construction season to complete once work has begun, but the schedule for this work would be dependent on the timeline for bridge construction.

Impacts on West Side of Willamette River

Construction of the west-side bridge approach and ramps for Alternative 2B would be off-line and therefore would not impact existing travel routes. However, widening Glen Creek Road to five lanes and adding turn lanes at the Wallace Road/Glen Creek Road and Wallace Road/Orchard Heights Road intersections would have major impacts to adjacent properties as well as significant traffic impacts, as there are very few alternate routes in this corridor. Traffic mobility would be reduced for two construction seasons while this work was being completed.

A major component of Alternative 2B is the construction of new roadway connections to OR 22 in the Edgewater Street area. This work would cause disruption to OR 22 and to Edgewater Street for at least 2-3 construction seasons, although the impacts to traffic mobility would be moderate in comparison to the traffic impacts which would be experienced in this area under Alternative 2A (described earlier).

Alternative 3

Alternative 3 includes a new river crossing at the north end of the study area. The new bridge would carry six lanes of traffic and provide a new river crossing connection from Salem Parkway (near Tryon Street) on the east side of the Willamette River to Wallace Road on the west side of the river. On the east side of the river, the new alignment would connect directly to the Salem Parkway at Cherry Avenue and to a new interchange at the north end of the Commercial-Liberty Street couplet.

On the west side of the river, the new crossing aligns with Hope Avenue at Wallace Road. Alternative 3 also includes major modifications at the Wallace Road intersections with Hope Avenue, Orchard Heights Road, and Glen Creek Road. Alternative 3 would also include an at-grade connection to Marine Drive.

The estimated total project cost of Alternative 3 is $501 million (in 2015 dollars). Alternative 3 would take approximately 3 years to construct.

Impacts on East Side of Willamette River

Construction of Alternative 3 on the east side would have several major stages. Of all the alternatives, Alternative 3 has the most complex connection situation on the east side of the river. Construction on the east side of the river would take at least 2-3 construction seasons. The stages would include: construction of the new flyover bridge over the Commercial-Liberty Street couplet and Broadway Avenue; new entrance and exit ramps connecting to Salem Parkway; widening for major intersection modifications at Broadway Avenue and Cherry Avenue, and construction of a grade-separated interchange at the Commercial-Liberty Street

couplet. Mobility impacts would be high for through-traffic using Salem Parkway – these users would be re-routed to alternate routes such as Broadway Avenue and Cherry Avenue. In addition, construction-related traffic impacts would cause those traveling to and from Keizer to use alternate routes such as Front Street (which becomes River Road), Broadway Avenue, and Cherry Avenue.

Impacts on West Side of Willamette River

Construction staging of Alternative 3 on the west side would primarily be off-line of the existing transportation network, with the exception of intersection modifications at one location on Wallace Road, where work would entail widening for additional turn lanes at Hope Avenue. Traffic impacts to both regional and local travelers on Wallace Road would be moderate in comparison to other alternatives. However, impacts to adjacent properties in the immediate work area would be high. Construction activities on the west side of the river would be completed in two construction seasons.

Alternative 4A

Alternative 4A includes a new river crossing that carries six lanes from Pine and Hickory Streets on the east side of the Willamette River to Hope Avenue on the west side of the river. On the east side of the river at Commercial Street, the new bridge would connect to Pine Street with a three-lane exit ramp for eastbound traffic, and to Hickory Street with a three-lane entrance ramp for westbound traffic. Construction of these two ramps would require the relocation of Front Street along the riverfront. On the west side, the new bridge would connect to Wallace Road at Hope Avenue and also make a connection to Marine Drive.

The estimated total project cost of Alternative 4A is $306 million (in 2015 dollars). Alternative 4A would take approximately 3 years to construct.

Impacts on East Side of Willamette River

Construction staging on the east side of the river would be relatively minor due to the localized nature of the work. Modifications of the Commercial Street/Liberty Street and Pine Street/Liberty Street intersections would interrupt traffic for one construction season, including lane closures. Front Street would be out of service for at least two construction seasons due to bridge construction and street relocation. Other construction on the east side would primarily be off-line of the surface transportation system. Impacts to properties in the immediate four-block area could be high for at least one construction season. Alternate routes for impacted traffic include Broadway Avenue and Cherry Avenue.

Impacts on West Side of Willamette River

Construction on the west side of the river would be similar to what was described for Alternative 3.

Alternative 4B

Alternative 4B is a hybrid that includes Alternative 2A and Alternative 4A. Construction staging and impacts would a combination of what was previously described for those alternatives.

The estimated total project cost of Alternative 4B is $451 million (in 2015 dollars). Alternative 2B would take approximately 5 years to construct.

Alternative 4C

Alternative 4C includes the new bridge and connections described in Alternative 4A plus several additional major modifications. On the east side, the river crossing would be extended with a flyover structure that makes a four-lane direct connection to the Salem Parkway at Broadway Avenue. Also, Pine Street and Hickory Street would be converted to a couplet that would extend three blocks east of Liberty Street and through the Broadway Avenue intersection.

On the west side, the river crossing would make a direct connection to OR 22 with a long flyover and viaduct structure (to be called the OR 22 Connector).

The estimated total project cost of Alternative 4C is $692 million (in 2015 dollars). Alternative 4C would take approximately 5 years to construct.

Impacts on East Side of Willamette River

Under Alternative 4C, construction staging for work on the east side of the river would require several major stages. One of the first stages of roadway work would be to construct the new ramp connections from the Salem Parkway to Commercial and Liberty Streets. Following this, traffic could be switched over and the bridge approach for the flyover structure could be built; the flyover structure could be constructed over Commercial and Liberty Streets in parallel to this work. Both Commercial and Liberty Street would maintain connectivity to the Salem Parkway and to Keizer during construction. Minor work would take place on Pine Street and Hickory Street to accommodate the new couplet design and the connection to the river crossing bridge.

The construction of the flyover structure and its direct connection to the Salem Parkway would result in significant traffic impacts for regional travelers going to downtown Salem or to destinations west of the Willamette River. The work would impact local users to a lesser degree. However, there would be lane closures, road

closures, and detours in place during construction. Alternate routes would be utilized during construction work on the east side as described for Alternate 4A. This work would take at least two construction seasons to complete. Impacts to properties in the immediate area of construction would be relatively high due to the construction staging plans noted earlier. Traffic impacts to regional travelers could also result in impacts to businesses and properties beyond the project area.

Impacts on West Side of Willamette River

Construction staging of Alternative 4C on the west side of the river would be a combination of what has already been described for other alternatives, with several additions. The new river crossing and its connection to Wallace Road and Marine Drive would be similar to that described under Alternative 4A. However, major intersection modifications on Wallace Road would include additional turn lanes at the Hope Avenue, Orchard Heights Road, and Glen Creek Road intersections. Additionally, Marine Drive would be constructed from Glen Creek Road to Brush College Road.

The largest addition to the construction work described under Alternative 4A would be the construction of the OR 22 Connector above Marine Drive, which would provide a direct connection from Salem Parkway to OR 22 via the new bridge. Much of the construction would be off-line from the existing street system and therefore would have only minor traffic impacts. However, the actual connection to OR 22 in the Edgewater Street area would be similar to what was described for Alternative 2B.

Traffic impacts on the west side would be relatively high to both regional and local travelers on both OR 22 and Wallace Road due to the extent of the modifications (similar to those described under Alternatives 4A and 2B). However, traffic impacts and impacts to properties on the west side would not be as high as under Alternative 2A. (This difference in impacts is because Alternative 2A would not have an alternate route during construction and would, therefore, cause substantial traffic disruption impacts associated with construction work on westside ramps and connections to the existing bridges. Alternative 4C would avoid much of this impact, thus impacts related to Alternative 4C would be less than with Alternative 2A.)

Alternative 4D

Alternative 4D is the same as Alternative 4C, with the exception of one minor difference on the east side. Under Alternative 4D, the conversion of Pine and Hickory Streets to a one-way couplet goes no further east than Liberty Street. This difference would not change the overall construction staging plan nor would it significantly reduce the traffic or property impacts from this alternative. It would have only a minor reduction of impacts in the localized vicinity from Liberty Street to Broadway Avenue.

The estimated total project cost of Alternative 4D is $687 million (in 2015 dollars). Alternative 4D would take approximately 5 years to construct.

Alternative 4E

Alternative 4E is the same as Alternative 4C, with the exception of one minor difference on the west side. Under Alternative 4E, the OR 22 Connector take a slightly more westerly alignment than under Alternative 4C, thereby minimizing impacts to Wallace Marine Park. This alternative has the same level of construction impact to the traveling public as Alternative 4C. With respect to properties, Alternative 4E has slightly less impact to Wallace Marine Park and slightly more impact to residential properties than does Alternative 4C.

The estimated total project cost of Alternative 4E is $708 million (in 2015 dollars). Alternative 4E would take approximately 5 years to construct.

River Traffic

To this point, this report has focused on the construction impacts of each Build alternative to land areas on the respective east and west sides of the Willamette River. This section addresses impacts to river users, which are assumed to be boat traffic. Since every alternative builds a new structure with new piers in the water, all alternatives would have some impact to boat traffic. Alternatives 2A and 2B would have the highest relative impact due to major construction activities very close to the Wallace Marine Boat Ramp and due to their close proximity to the popular boating area just upstream of the existing bridges near Minto Brown Island. Alternative 3 and all the Alternative 4 options would have significantly less impacts due to their location away from the boat ramp and the popular boating area near Minto Brown Island.

Mitigation Measures

The Build alternatives addressed in this report all share an opportunity to implement best practices for construction staging. As such, there are many measures that can be implemented to mitigate temporary traffic and land use impacts caused by construction. These include the following items:

1. Minimize construction duration through the use of alternative delivery methods that place a high emphasis on an accelerated construction schedule.
2. Implement a highly effective public involvement/public relations plan to educate travelers about the project and keep them regularly informed of construction activities.
3. Place a high priority on maintaining regional mobility during construction – this pivotal river crossing must continue to operate during construction.

4. Develop high quality construction staging and traffic control plans that balance the needs of the construction contractor with the on-going needs of the traveling public and local land owners.
5. Demonstrate strong community leadership in the planning, design, and construction of the project.

Attachments

Attachment A: Construction Impacts Summary Table
Attachment B: Project Cost Estimate Itemization
Attachment C: Alternative Plan & Elevation and Foundation Location Design Drawings

Attachment A

Attachment B

Attachment C