South Stage Road
Extension Plan

Technical Memorandum

August 30, 2024 Project# 27003.014

To: Lisa Cornutt, ODOT
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From: John McPherson, HDR

RE: Task 5.2.2.2B: Environmental Screening Analysis Appendix

INTRODUCTION

The Oregon Department of Transportation (ODOT) is preparing a Facility Plan to evaluate potential transportation improvements across Interstate 5 (I-5) between the Phoenix Interchange (at Exit 24) and South Medford Interchange (at Exit 27) in South Medford, Oregon. The purpose of this memorandum is to serve as an environmental analysis appendix to support *TM #5.2.2: Refined (Most Promising) Alternative Analysis*. This environmental screening considers whether alternatives satisfy the project Purpose and Need and presents potential environmental effects for key environmental resources to support the recommended alternative(s) determination.

OVERVIEW OF ALTERNATIVES DEVELOPMENT AND SCREENING

The alternatives development and screening analysis for the South Stage Road Extension was completed in a multi-step process. Through public and agency engagement, 16 alternatives were identified with the potential to satisfy the Purpose and Need for the project. The 16 alternatives were first evaluated to determine whether they were technically and economically feasible and satisfied the purpose and needs of the project. See *TM #5.2.2: Refined (Most Promising) Alternative Analysis* for detail. Based on that analysis, four Overpass/Underpass Alternatives and four Interchange Alternatives were identified as technically and economically feasible and satisfied the Purpose and Need. The four Overpass Alternatives (O-1, O-2, O-3, and O-4) would not have connections to I-5, while the four Interchange Alternatives (I-1, I-2, I-3, and I-4) would have access ramps onto and off of I-5. Each of the eight alternatives was analyzed using environmental screening criteria. The eight alternatives and the concept-level screening metrics shown in Table 1 were shared with the Project Development Team, Project Advisory Committee, and the public in spring 2024.

Table 1. Potential Environmental Impacts of the Proposed Technically and Economically Feasible Alternatives

Measure	Alternative O-1	Alternative O-2	Alternative O-3	Alternative O-4	Alternative I-1	Alternative I-2	Alternative I-3	Alternative I-4
Park - Section 4(f)[1]	146,000 SF	172,400 SF	172,400 SF	172,400 SF	488,000 SF	369,200 SF	421,200 SF	514,400 SF
Rank	*1*	*2*	*2*	*2*	*5*	*3*	*4*	*6*
Wetlands and waters[1]	3,170 SF	46,260 SF	24,110 SF	46,260 SF	58,450 SF	101,540 SF	79,390 SF	101,540 SF
Rank	*1*	*3*	*2*	*3*	*4*	*6*	*5*	*6*
Environmental justice	No acquisitions. Noise and air quality effects to San George Estates.	No acquisitions. Noise and air quality effects to San George Estates.	No acquisitions. Noise and air quality effects to San George Estates	No acquisitions. Noise and air quality effects to San George Estates. At-grade proximity to property.	No acquisitions. Noise and air quality effects to San George Estates.	No acquisitions. Noise and air quality effects to San George Estates.	No acquisitions. Noise and air quality effects to San George Estates.	No acquisitions. Noise and air quality effects to San George Estates . At-grade proximity to property.
Rank	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*
Floodplains[1]	34,600 SF	32,200 SF	32,200 SF	32,200 SF	137,400 SF	32,200 SF	32,200 SF	135,000 SF
Rank	*2*	*1*	*1*	*1*	*4*	*1*	*1*	*3*
Historic resources[2]	None identified	None identified	None identified	None identified	None identified	None identified	None identified	None identified
Rank	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*
Community cohesion	Does not split a neighborhood.	Does not split a neighborhood.	Does not split a neighborhood.	Does not split a neighborhood.	Does not split a neighborhood.	Does not split a neighborhood.	Does not split a neighborhood.	Does not split a neighborhood.
Rank	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*
Number of developed parcels with potential ROW takes	3 developed parcels	3 developed parcels	3 developed parcels	3 developed parcels	3 developed parcels	3 developed parcels	3 developed parcels	3 developed parcels
Rank	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*	*0 (Same)*
Number of undeveloped parcels with potential ROW takes	6 undeveloped parcels	5 undeveloped parcels	5 undeveloped parcels	5 undeveloped parcels	8 undeveloped parcels	7 undeveloped parcels	7 undeveloped parcels	7 undeveloped parcels
Rank	*2*	*1*	*1*	*1*	*4*	*3*	*3*	*3*
Number of structures requiring removal	-	-	-	-	-	2 structures	-	2 structures
Rank	*1*	*1*	*1*	*1*	*1*	*2*	*1*	*2*
Total ROW acreage	609,400 SF	611,800 SF	620,500 SF	611,800 SF	1,437,300 SF	1,176,300 SF	1,259,600 SF	1,176,300 SF
Rank	*1*	*2*	*3*	*2*	*6*	*4*	*5*	*4*

[1] Impacts for parks, wetlands, and floodplains are based on the worst case for fill. These impacts will be refined based on assumptions for columns.
[2] Detailed survey has not been completed.
Rank: 1 = lowest impact; 6 = highest impact. Colors are used to visually compare alternatives (dark green, light green, yellow, orange, and red are used to highlight lowest to highest impact and denote similar impact levels).
Green text: Indicated potential opportunity for less environmental justice noise and visual impacts because South Stage is at grade adjacent to the subject properties.
ROW = right-of-way; SF = square feet.

ENVIRONMENTAL SCREENING ANALYSIS

Overpass/Underpass Alternatives

Purpose and Need considerations. The Overpass/Underpass Alternatives all satisfy the Purpose and Need within the Year 2045 forecast horizon with considerably fewer environmental impacts compared to the Interchange Alternatives.

Technical considerations. The Overpass/Underpass Alternatives are all technically feasible.

Environmental considerations. As can be seen in Table 1, the Overpass Alternatives all have considerably fewer impacts than the Interchange Alternatives. Amongst the Overpass/Underpass Alternatives, all have relatively similar effects with respect to the initial screening criteria, except park use and wetland impacts. While O-1 has fewer park impacts than other alternatives, it is only 0.6 acres less. Because all alternatives would have a park use, a least overall harm analysis and additional mitigation planning would likely be needed to use this criterion as a determining factor to eliminate Overpass/Underpass Alternatives from further analysis. Similarly, O-1 and O-3 have fewer wetland impacts than O-2 and O-4; however, this analysis was performed without field-delineated wetlands and without the design level that may be able to further avoid or reduce wetland impacts. For these reasons, it is not recommended to screen out Overpass/Underpass Alternatives at this stage based on wetlands.

A large part of the reason that the Overpass/Underpass Alternatives are similar in impact is their horizontal alignments—horizontally, they vary only slightly from each other. This is because the available corridor is constrained by existing development, the environmental justice community, and the vertical engineering challenges of getting over or under I-5.

Other Environmental and Technical Considerations. Not all of the potential impacts, costs, and technical considerations were captured by the screening criteria. In reviewing the potential Overpass/Underpass Alternatives, the team determined that O-1 and O-3 would have greater technical and cost impacts to utilities and planned land uses but with similar benefits as O-2 and O-4, as explained below.

- East of I-5, O-1 and O-3 traverse the corridor north of the substation and require the relocation of high voltage powerlines. O-2 and O-4 are south of the substation and avoid these utility impacts.
- O-1 and O-3 have right-of-way needs from the Centennial Golf Course and commercial property to the north to preserve the five-lane right-of-way footprint previously recommended. The southerly alignments of O-2 and O-4 avoid these impacts.

- O-1 and O-3 have 2.60 acres of impact to developed and approved land uses. O-2 and O-4 avoid these impacts.

Facility Plan recommendations. Because the horizontal alignments only vary slightly and Alternatives O-1 and O-3 have would major impacts and relocation costs to utilities and future land uses without considerably greater environmental impacts based on the screening criterial the facility plan will focus on refining Alternatives O-2 (overpass) and O-4 (underpass). Advancing O-2 and 0-4 alternatives for development with forward compatible interchanges of Alternatives I-2 and I-4 will provide a range of alternatives that capture differences in cost and impacts.

Note that while O-2 and O-4 are recommended for additional refinement in the facility plan, additional engineering and environmental analyses are recommended to ultimately identify the final alignment for NEPA analysis. The horizontal alignments of the remaining alternatives should really be considered design variations of each other. The engineering and environmental work necessary to make a final determination as the final alignment is not sufficient at this concept level of analysis. More detailed field investigation and engineering are needed to make a recommendation on the final alignment.

Interchange Alternatives

Purpose and Need considerations. While the Interchange Alternatives would solve identified transportation problems, the operational and safety analyses have not shown a distinct need for an interchange within the 2045 forecast year nor distinguishable benefits within the study area based on the Purpose and Need. In other words, an interchange can solve the identified transportation problems, but it is essentially overkill for what is needed to address the traffic anticipated by 2045. The Interchange Alternatives come with financial and environmental costs that are not justified given the forecast demand. An interchange would only likely be justified if employment and/or population growth east of I-5 and south of Juanipero Road were to occur faster than currently forecast. At this time, the growth that might justify an interchange is expected to occur beyond the 2045 forecast year.

Technical considerations. Because of their proximity to I-5 interchanges at South Medford (north) and Phoenix Road (south), the Interchange Alternatives would require spacing design exceptions.

Environmental considerations. As seen in Table 1, the Interchange Alternatives would have greater impacts to environmental resources for nearly every criterion because of the greater footprint needed to accommodate the ramps to and from I-5 (compared to Overpass/Underpass Alternatives, which do not have those ramps).

Facility Plan Recommendations. The Medford City Council and Chamber of Commerce anticipate a future need for an interchange and requested an interchange alternative be included in the Facility Plan. In response, the study team has proposed a phased approach to the alternatives moving forward. The team will identify an Overpass/Underpass Alternative for the first phase of construction (i.e., by the year 2045) but create a design that that has forward compatibility to accommodate future demand (based on current forecasts beyond 2045). The overpass/underpass will be designed such that in the future, when warranted by the traffic forecast, it could be converted to an interchange with relatively minor modification to the existing facility. The Facility Plan would define the overpass/underpass as Phase 1 and the interchanges as Phase 2 (i.e., when warranted by forecast). Phase 1 could be developed in the near term when funding is available for completing environmental review, design, and construction. Phase 2 could be developed when an interchange is justified according to a future 20-year forecast.

An interchange concept should be retained in the Facility Plan for future planning beyond 2045. If demand grows faster than forecasted, an interchange concept may be advanced within the 2045 timeframe.

ALTERNATIVES ADVANCED FOR REFINEMENT

Two alternatives with forward-compatible interchange concepts have been advanced for additional engineering and environmental analysis in the Facility Plan: Alternative O-2 is an overpass (Figure 1), and O-4 is an underpass (Figure 2). Both have alignments that traverse south of the substation on the east side of I-5. Both alternatives would be compatible with an interchange in a future phase (Figure 3).

Figure 1. Alternative O-2 Overpass

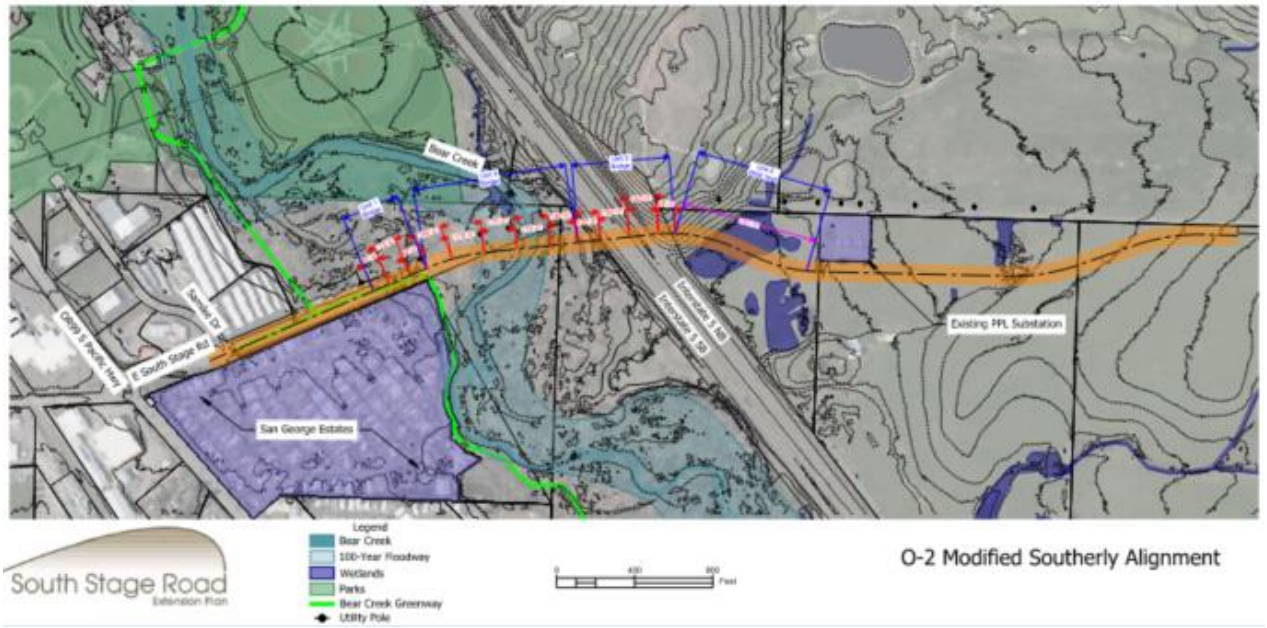


Figure 2. Alternative O-4 Underpass

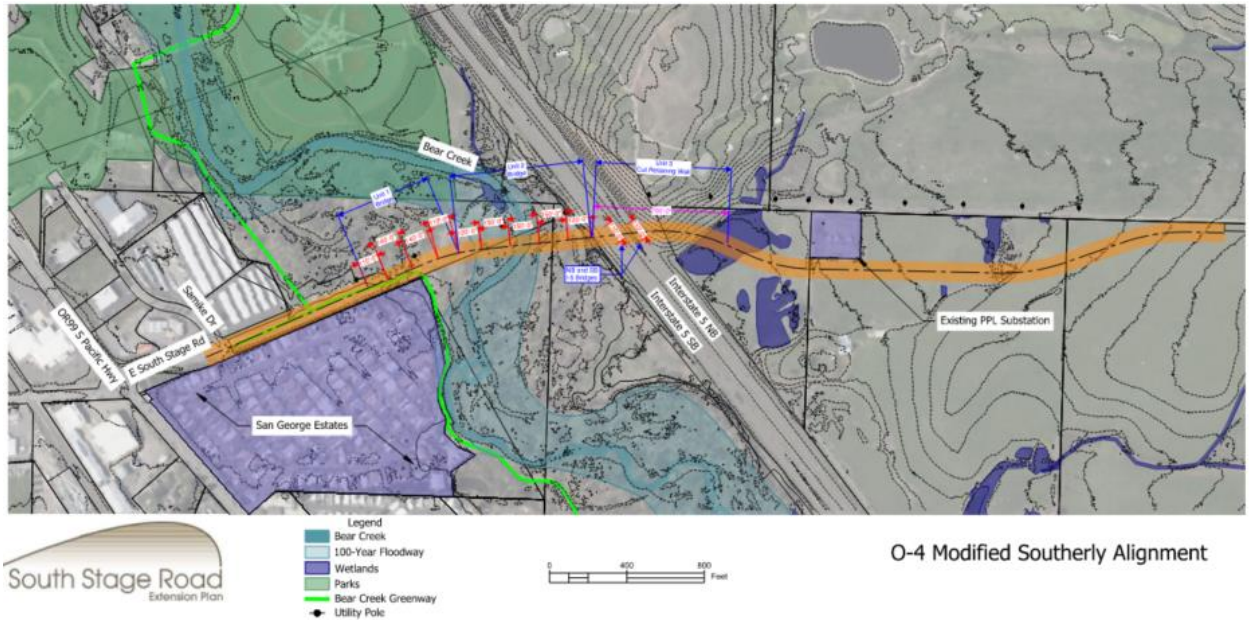
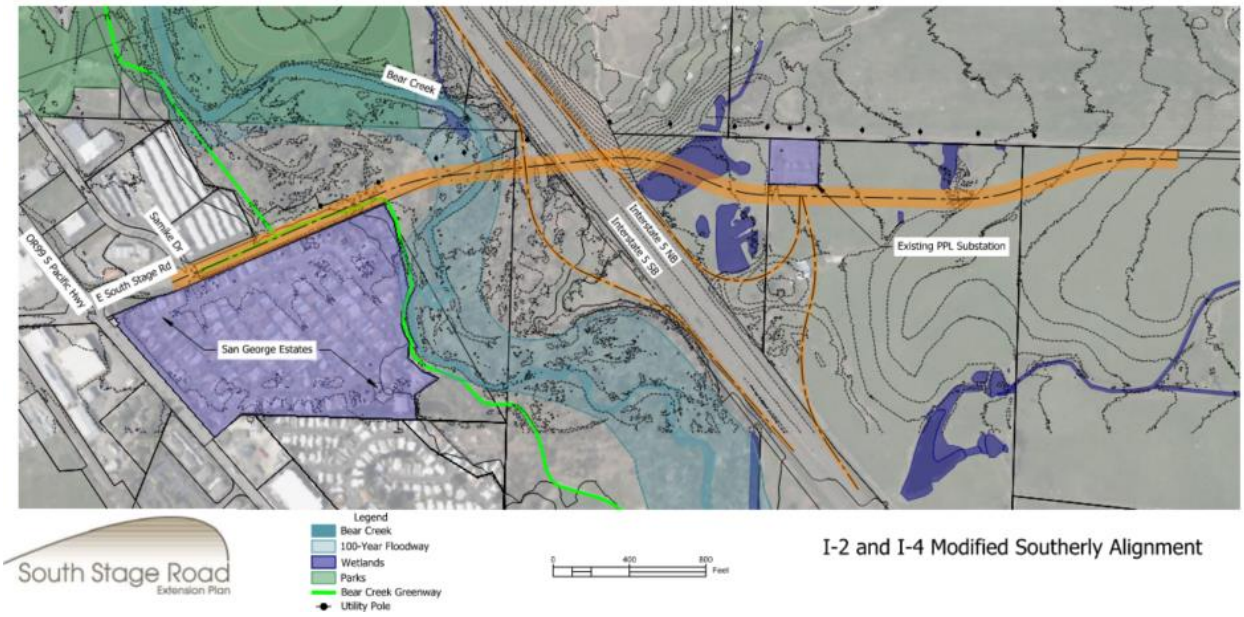


Figure 3. Future Compatible Interchange Concept



These alternatives were refined to optimize their alignments. The optimization includes identifying conceptual pier placement to avoid piers in Bear Creek and to minimize effects to the 100-year floodplain. On the east side, a recent wetland delineation was available for a portion of the study area. The delineation reduced the extent of wetlands and also provided opportunities for the alignments to avoid some wetlands. As a result, the proposed routing of both O-2 and O-4 was modified slightly to avoid some wetlands.

With these refinements in engineering and new wetland information, the project team was able to reduce impacts to a number of the evaluation criteria (parks, wetlands, floodplains, and parcel impacts). See Table 2 for the results.

Table 22. Potential Environmental Impacts of the Modified Alternatives

Measure	Overpass and Compatible Interchange		Underpass and Compatible Interchange	
	Modified O-2	Modified I-2	Modified O-4	Modified I-4
	Phase 1	Phase 2	Phase 1	Phase 2
Park - Section 4(f)	109,000 SF	286,600 SF	112,600 SF	290,200 SF
Wetlands and waters[1]	24,390 SF	24,390 SF	24,390 SF	24,390 SF
Environmental justice	No acquisitions. Noise and air quality effects to San George Estates.	No acquisitions. Noise and air quality effects to San George Estates.	No acquisitions. Noise and air quality effects to San George Estates. At-grade proximity to property.	No acquisitions. Noise and air quality effects to San George Estates. At-grade proximity to property.
Floodplains[1]	4,800 SF	4,800 SF	7,200 SF	7,200 SF
Historic resources[1]	None identified	None identified	None identified	None identified
Community cohesion	Does not split a neighborhood.	Does not split a neighborhood.	Does not split a neighborhood.	Does not split a neighborhood.
Number of developed parcels with potential ROW takes	2 developed parcels	2 developed parcels	2 developed parcels	2 developed parcels
Number of undeveloped parcels with potential ROW takes	4 undeveloped parcels	5 undeveloped parcels	4 undeveloped parcels	5 undeveloped parcels
Number of structures requiring removal	-	2 structures	-	2 structures
ROW acreage	632,000 SF	1,372,090 SF	632,000 SF	1,372,090 SF

[1] Detailed survey has not been completed
ROW = right-of-way; SF = square feet.