
Appendix D. Summary of Avoidance, Minimization, and Mitigation Measures

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Summary of Proposed Avoidance, Minimization, and Mitigation Measures

Table D-1 summarizes the avoidance, minimization, and mitigation measures that would be implemented to ensure that construction and operation of the Revised Build Alternative would not result in substantial impacts to the natural and human environment.

Table D-1. Summary of Proposed Avoidance, Minimization, and Mitigation Measures

Environmental Resource	Avoidance, Minimization, and Mitigation Measures
Air Quality	<p>The implementation of best management practices (BMPs) during construction would reduce the potential for Project-related impacts to air quality.</p> <p>The Project would implement the following measures, as appropriate, to control dust emissions consistent with OAR 340-208-0210, Requirements for Fugitive Emissions:</p> <ul style="list-style-type: none"> • Use of water or chemicals, where possible, for dust control during demolition of existing buildings or structure, construction operations, grading of roads, or clearing of land • Application of asphalt, oil, water, or other suitable chemicals on unpaved roads, material stockpiles, and other surfaces that can create airborne dust • Full or partial enclosure of materials stockpiles in cases where application of oil, water, or chemicals is not sufficient to prevent particulate matter from becoming airborne • Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials • Adequate containment during sandblasting or similar operations • Using covers on open-bodied trucks during transport of materials that are likely to become airborne • Prompt removal of soil, dust, or other airborne-prone material from paved streets <p>ODOT would also monitor construction contractors to ensure contractor compliance with ODOT standard specifications for Construction Section 290, Environmental Protection, which includes the following: limits the idling time of trucks and other diesel-powered equipment to 5 minutes when not in use or in motion, requires truck staging areas to be located in areas where emissions would have a minimum impact on sensitive populations (such as schools and residences), and requires the removal of all loose dirt and debris from trucks prior to leaving the construction areas. In addition, road or lane closures would be focused to non-peak traffic periods, when possible, to reduce the impact of construction delays on traffic flow and resultant vehicle emissions. Assuming compliance with OAR 340-208-0210 and ODOT standards for construction, the Revised Build Alternative would not have substantial adverse short-term or long-term impacts on air quality.</p>
Climate Change	<p>Large reductions in GHG emissions are required to mitigate global climate change, so the State of Oregon, Multnomah County, and the City of Portland are taking multiple steps to reduce GHGs statewide via various programs and initiatives. These programs and initiatives act to reduce transportation sources by encouraging electric vehicle use, shift from single-passenger commuting to carpooling, and mode shift from passenger vehicles to public transport and bicycles and/or pedestrian facilities, to name a few. Cumulatively, these will act to reduce GHG emissions statewide during the life of the Revised Build Alternative. No Project-level mitigation is proposed.</p>

Environmental Resource	Avoidance, Minimization, and Mitigation Measures
Archaeology	<p>ODOT has an Inadvertent Discovery Plan for the Project. If impacts to archaeological resources discovered during construction of the Revised Build Alternative are unavoidable and would diminish integrity of a site that is eligible for the National Register of Historic Places (NRHP), ODOT would resolve impacts through implementation of stipulations from the Project-specific PA (ODOT 2019c), which provides protocols for identifying, evaluating, and resolving impacts pursuant to 36 Code of Federal Regulations (CFR) 800.13 and 36 CFR 800.14.</p> <p>ODOT's standard protocol in the event of an inadvertent discovery is described in ODOT Specification 290.50, <i>Protection of Cultural Resources</i>³²:</p> <p><i>Comply with all laws governing preservation of cultural resources. Cultural resources may include, but are not limited to, dwellings, bridges, trails, fossils, and artifacts.</i></p> <p><i>If cultural resources are encountered on the Project Area or in material sources, and their disposition is not addressed in the Special Provisions, do the following:</i></p> <ul style="list-style-type: none"> • <i>Immediately discontinue operations or move to another area of the Project Site or material source.</i> • <i>Protect the cultural resource from disturbance or damage.</i> • <i>Notify the Engineer.</i> <p><i>The Engineer will do the following:</i></p> <ul style="list-style-type: none"> • <i>Arrange immediate investigations.</i> • <i>Arrange for disposition of the cultural resources. The Engineer may direct the Contractor to perform salvage operations according to 00140.30 or 00140.60.</i> • <i>Notify the Contractor when to begin or resume construction operations in the affected area.</i> <p>ODOT would require the contractor to follow ODOT Specification 290.51, <i>Protection of Sensitive Cultural Sites</i>,³³ throughout the duration of construction. ODOT's requirement that the contractor follow the above specification along with the Inadvertent Discovery Plan and Project-specific PA (and the mandatory protocols contained therein) would ensure substantial adverse effects to newly discovered archaeological resources would be avoided.</p>
Historic Resources	<p>The implementation of BMPs during construction would reduce the potential for Project-related noise and inadvertent impacts to historic properties.</p> <p>The Project would follow the ODOT construction specifications and BMPs to minimize high noise levels during construction. Avoidance and minimization measures for potential construction-related vibration would include pre- and post-construction assessments, on-site monitoring during construction, and stop work authorization. If it is likely that the Project would affect historic properties by vibration, ODOT would prepare a treatment plan consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties, and thus consistent with the requirements of 36 CFR 800.5(b), to make the applicable repairs. If repairs are necessary due to the vibration, alterations to historic resources may require a land use review, such as a Historic Resource Review, from the City of Portland.</p> <p>ODOT, FHWA, and Oregon SHPO have signed a project-level PA, in consultation with Tribes and other parties, to avoid and/or minimize the potential for Project-related effects to archaeological resources and built historic properties, as the extent of these potential effects would be unknown prior to the implementation of the Revised Build Alternative (Appendix C). With the execution of the PA, and the avoidance and minimization measures contained herein and in the <i>Historic Resources Technical Report</i> (ODOT 2019b) and the <i>Historic Resources Supplemental Technical Report</i> (Appendix A), the Project would result in no adverse effects to the characteristics that make historic properties within the API eligible for the NRHP. Therefore, a finding of "no historic properties adversely affected" pursuant to 36 CFR 800.5(b) is</p>

³² ODOT Standard Specifications for Construction:
https://www.oregon.gov/odot/Business/Specs/2021_STANDARD_SPECIFICATIONS.pdf

³³ Ibid.

Environmental Resource	Avoidance, Minimization, and Mitigation Measures
	<p>appropriate. Additional details on the effects assessment for historic properties are included in the <i>Historic Resources Technical Report</i> (ODOT 2019b) and <i>Historic Resources Supplemental Technical Report</i> (Appendix A).</p>
Section 4(f)	<p>The following measures would be implemented to reduce the potential for adverse impacts to Section 4(f) resources:</p> <ul style="list-style-type: none"> • ODOT would require construction contractors to follow ODOT specifications and BMPs to minimize high noise levels near Section 4(f) properties during construction (see the <i>Noise Supplemental Technical Report</i> in Appendix A). • ODOT would coordinate with FHWA and the Oregon SHPO to implement the avoidance and minimization conditions contained in the <i>Historic Resources Technical Report</i> (ODOT 2019b), the <i>Historic Resources Supplemental Technical Report</i> (Appendix A), and the PA described in Section 3.6.2.3 to avoid and/or minimize the potential for Project-related vibration impacts to the Travelodge at the Coliseum. <p>ODOT would consider—and further evaluate during final design—the recommendation in the <i>Noise Supplemental Technical Report</i> (Appendix A) that a noise wall be considered in one location along the eastern edge of I-5 that would shield Lillis-Albina Park from traffic noise.</p>
Hazardous Materials	<p>Prior to acquiring properties or commencing construction activities, ODOT would conduct a full Hazardous Materials Corridor Study. The study would review historical information and existing databases to identify potential hazardous materials in the Project Area and on surrounding properties. ODOT would conduct Phase I Environmental Site Assessments for any properties to be acquired to construct the Revised Build Alternative, and Phase II Environmental Site Assessments would be conducted on properties where the Phase I Environmental Site Assessment indicated that contamination may be present.</p> <p>ODOT would require the construction contractor to implement the following measures to address hazardous materials concerns:</p> <ul style="list-style-type: none"> • Prior to any demolition or removal activities, all structures would be tested for LBP and ACBM with a Hazardous Building Materials Assessment by a qualified contractor in accordance with worker protection and material disposal regulations (refer to ODOT's HazMat Program Procedures Guidebook [ODOT 2010]). Potential polychlorinated biphenyl (PCB)-containing hydraulic or electrical equipment would be tested for PCBs by a qualified contractor prior to handling or disposal. • During construction, the contractor would be required to follow the applicable regulations regarding the transport, use, and storage of hazardous materials. • The contractor would be required to develop a Health and Safety Plan for all construction activities consistent with applicable laws and best practices in effect at the time of construction. • The contractor would be required to follow a Project-specific Pollution Control Plan to prevent spills and contain their potential spread. • The contractor would be required to develop a Contaminated Media Management Plan that specifies the correct handling and disposal of hazardous materials encountered during construction and includes procedures to be used if encountering previously unexpected hazardous materials. <p>Implementation of the measures listed above would help ensure that adverse effects from hazardous materials would not occur during construction and operation of the Revised Build Alternative. Additional measures related to protection of water resources are provided in Section 3.15.2.3.</p>
Land Use	<p>Because the Revised Build Alternative complies with the City of Portland comprehensive plan, the Oregon Transportation Plan and RTP, and applicable state land use laws, plans, and policies, no additional avoidance, minimization, or mitigation measures are proposed.</p> <p>If the Revised Build Alternative is determined to be subject to the design overlay zone requirements of the Lloyd District Design Subdistrict or the River Overlay zone of the Adopted</p>

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	<p>Central City 2035 Plan, adjustments to its design may be necessary. Such design adjustments would be intended to help the Revised Build Alternative comply with land use regulations; therefore, revisions to do so would not be expected to have adverse impacts on land use.</p>
Noise	<p>ODOT would monitor the construction contractor to ensure the following noise abatement measures identified in the <i>ODOT Standard Specifications for Construction</i> (2021) are implemented to minimize the adverse effects of construction activity on the local community:</p> <ul style="list-style-type: none"> • Do not perform construction within 1,000 feet of an occupied dwelling on Sundays or legal holidays, or between the hours of 10:00 PM and 6:00 AM on other days, without an approved noise variance from the City of Portland. • Use equipment with sound control devices no less effective than those provided on the original equipment. Equipment with un-muffled exhausts is prohibited. • Use equipment complying with pertinent equipment noise standards of the U.S. Environmental Protection Agency. • Do not drive piling or perform blasting operations within 3,000 feet of an occupied dwelling on Sundays or legal holidays, or between the hours of 8:00 PM and 8:00 AM on other days, without an approved noise variance from the City of Portland. • Mitigate the noise from rock crushing or screening operations performed within 3,000 feet of all occupied dwellings by placing material stockpiles between the operation and the affected dwellings, or by other means approved by the City of Portland. • No construction that requires access to or use of Portland Public Schools (PPS) property at Harriet Tubman Middle School would occur during the school year. <p>If a specific noise impact complaint occurs during the construction of the Revised Build Alternative, one or more of the following noise mitigation measures may be required at the construction contractor's expense as directed by the ODOT construction Project manager:</p> <ul style="list-style-type: none"> • Locate stationary construction equipment as far from nearby noise sensitive properties as feasible. • Shut off idling equipment. • Reschedule construction operations to avoid periods of noise annoyance identified in the complaint. • Notify nearby residents whenever extremely noisy work would be occurring. • Install temporary or portable acoustic barriers around stationary construction noise sources. • Operate electric-powered equipment using line voltage power or solar power. <p>Because properties in the API were predicted to meet or exceed the NAAC under the Revised Build Alternative, noise abatement measures were considered and evaluated for feasibility and reasonableness per FHWA and ODOT guidelines. Seven noise wall alignments were evaluated to mitigate predicted noise impacts. One of the noise walls was judged to be acoustically feasible by meeting the design goal of at least a 7 dBA reduction at one receiver, as well as achieving a better than 50 percent rate of benefits (i.e., at least a 5 dBA noise reduction) at impacted receivers. The wall was found to be reasonable based on the ODOT cost-effectiveness requirements and has therefore been recommended for further consideration. Noise Wall 5 was not evaluated for noise mitigation, as there were no impacted receptors at this location under the Revised Build Alternative. The remaining five walls were not able to achieve the required noise reductions at adjacent properties because of challenges with complex traffic noise sources or because elevation issues precluded the breaking of the line-of-sight between noise sources and receivers. Additionally, ODOT cost-effectiveness requirements for reasonableness determination are not met for the remaining walls. As a result, those walls were not recommended for further consideration. For detailed information on the evaluation of noise walls for the Revised Build Alternative, see the <i>Noise Supplemental Technical Report</i> (Appendix A).</p> <p>The one noise wall considered acoustically feasible and reasonable is described as follows:</p> <ul style="list-style-type: none"> • Noise Wall 2: Noise Wall 2 would be a 12-foot-tall and approximately 1,456-foot-long noise barrier, extending along the eastern edge of I-5 ROW from approximately

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	<p>N Russell Street to N Flint. The wall would be designed to shield Lillis-Albina Park, Harriet Tubman Middle School, and a single-family residence (and historic building) located east of I-5 adjacent to N Flint. This alignment is within the ODOT ROW, which allows construction to take place on I-5 rather than from the non-highway side. This alignment makes it possible to site the wall on top of a retaining wall, which would increase stability.</p> <p>Further evaluation of the feasibility and reasonableness of Noise Wall 2 would be made during final design and is subject to change to include a more detailed analysis of constructability, as well as the potential visual impacts of Noise Wall 2 on affected property owners and residents. A final decision of the installation of the abatement measure(s) would be made upon completion of the Project's final design, a cost-estimating process, constructability review, and the public involvement processes. For more information on this recommended noise wall, see the <i>Noise Supplemental Technical Report</i> (Appendix A).</p>
Right of Way	<p>ROW impact research for the NEPA process was conducted and summarized in 2017 and 2018. During that time, multiple workshops, community outreach efforts, and avoidance and minimization measures were considered and incorporated into planning efforts. These avoidance and minimization measures reduced the number of initially projected property impacts and have been incorporated into the current Project design. No additional mitigation is proposed. Measures that would be implemented by ODOT during ROW acquisition include the following:</p> <ul style="list-style-type: none"> • Ensure fair and equitable treatment of all persons affected by the Revised Build Alternative by performing all ROW acquisition and relocation activities in accordance with the URA (49 CFR 24), ORS 35, and the ODOT <i>Right of Way Manual</i> (2018a). • Conduct relocation interviews early in the ROW acquisition process to identify and address any special needs. • Provide interpreter and translation services for owners and tenants, as needed. • Identify ways to minimize or mitigate impacts to individual properties through design and/or construction staging, such as through BMPs, temporary traffic control plans, and temporary access plans. • Explore the use of alternative acquisition methods such as early or advanced acquisition for full site acquisitions where design decisions have advanced such that ROW location options are limited. • Schedule construction work that requires access to or use of PPS property at Harriet Tubman Middle School to occur outside of the school year. • When the design level is more advanced, revisit, in coordination with FHWA, whether construction activities would have an effect on adjacent properties and businesses with sensitive patients, medical equipment, or machinery including hospitals, elderly or psychiatric patient care services, and emergency response units. If additional impacts are identified, they would be appropriately mitigated, including, if required, acquisition and relocation in accordance with the URA. • Conduct early discussions with Oregon Department of State Lands and Union Pacific Railroad Company regarding ROW needs and processes for work near their lands, including new and existing structures over the Union Pacific Rail Corridor.
Socioeconomics	<p>The following measures would be implemented to reduce the potential for substantial, short-term, adverse socioeconomic impacts during the construction phase of the Project:</p> <ul style="list-style-type: none"> • Temporary traffic management plans would be prepared to minimize construction impacts on I-5 operations and traffic delays on local streets. These plans would address all modes of transportation, including bicycles, pedestrians, and public transit. The plans would be prepared by the construction contractors. • ODOT would monitor construction contractors to ensure <i>Oregon Standard Specifications for Construction</i> (ODOT 2021) are followed to minimize impacts to

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	<p>neighborhoods, businesses, schools, emergency responders, and utilities and public service providers located or operating in the API.</p> <ul style="list-style-type: none"> • ODOT would coordinate with TriMet and Portland Streetcar to follow standard procedures regarding temporary impacts to transit services, including procedures for temporary transit stop closures or relocations, schedule changes, route diversions, and relocation of existing motor vehicle/transit lanes that would be required during construction. • Construction activities near Harriet Tubman Middle School would be scheduled for summer months to avoid potential disruptions during the school year. <p>ODOT would continue to conduct public outreach to residents and businesses in the API throughout final design and construction.</p>
Environmental Justice	<p>Potential impacts to minority or low-income populations would be minimized or avoided through the following measures:</p> <ul style="list-style-type: none"> • ODOT would monitor construction contractors to ensure ODOT standard construction specifications are followed to limit vehicle and equipment idling time, prevent dirt and other materials from being tracked out of construction zones on vehicle tires, minimize the release of fugitive dust, and prevent the release of hazardous materials from spills and leaks or exposure to existing contamination to address the potential for short-term exposure of EJ populations to noise, exhaust, dust emissions, and hazardous materials during construction of the Revised Build Alternative. • ODOT would coordinate with the City of Portland and TriMet to develop an appropriate method to monitor and determine the effects of relocated bus routes on EJ populations during the anticipated 4-year construction period. If it is determined that EJ populations are experiencing disproportionate impacts, ODOT, the City, and TriMet would coordinate with the community to identify alternative bus routes to better serve EJ populations, possibly including an increase in the frequency of service on those routes. • ODOT would coordinate with the City of Portland and Portland Streetcar to develop an appropriate method to monitor and determine the effects of streetcar closures on EJ populations during the anticipated 4-year construction period. If it is determined that EJ populations are experiencing disproportionate impacts, ODOT, the City, and Portland Streetcar would coordinate with the community to identify alternative routes, and/or ODOT would identify additional reasonable measures to reduce those impacts, including providing free shuttle service through areas of construction. • ODOT would coordinate with the City of Portland and members of the community to identify alternative routes for people who walk, bike, and roll to use during periods when key walking and biking routes are closed during construction. • ODOT would monitor and determine the effects the temporary closure of key walking and biking routes could have on EJ populations. This would be accomplished by assigning observers to monitor the use of alternative routes and conducting surveys and voluntary one-on-one interviews. If it is determined that disproportionate impacts to EJ populations are occurring, ODOT would identify additional reasonable measures to reduce those impacts, including providing free shuttle service through areas of construction. <p>In addition to the measures described above, ODOT's DBE and Workforce program for the Project would maximize DBE contracting opportunities, including for small and minority-owned businesses.</p> <p>Considering the measures described above and the notable beneficial effects for EJ populations living and working in the API in terms of improved access to employment and services (for all modes) and enhanced public safety, it has been determined that the Revised Build Alternative would not cause disproportionate high and adverse effects on any minority or</p>

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	low-income populations, in accordance with the provisions of Executive Order 12898 and FHWA Order 6640.23A. ³⁴
Transportation – Transit	<p>ODOT would coordinate with City of Portland, TriMet and PSI in the future design phase to minimize construction impacts and maintain transit and streetcar service connections through the Project Area. This would include temporary bus detours during the construction period to avoid multiple temporary changes for a single bus route.</p> <p>As noted in Section 2.1.4, ODOT would continue to refine the design with input from the City, TriMet, and PSI to improve or further avoid, minimize, or mitigate impacts to transit operations through the Rose Quarter area that result from implementation of the Project. Such design refinements could include, but are not limited to, signal timing, consideration of transit stop locations relative to protected bike lanes and other design elements, and support features for predictable operations for transit vehicles, such as transit priority lanes. ODOT would coordinate with TriMet and PSI to minimize short- and long-term reliability and travel time impacts throughout final design.</p> <p>ODOT's continued collaboration with the City of Portland, TriMet, and PSI would inform design refinements needed to accommodate transit and streetcar service. ODOT would continue to coordinate with the City of Portland, TriMet, and PSI to identify and implement measures that would improve transit operations, or avoid or minimize impacts to transit and streetcar service connections, through the Project Area.</p>
Transportation – Active Transportation	<p>ODOT would require the construction contractor to develop a Temporary Traffic Control Plan following the City of Portland's current Traffic Design Manual, Vol 2 Temporary Traffic Control (PBOT 2019b) to minimize construction-phase impacts to people who walk, bike, and roll. The following City of Portland priorities would guide the development of the Temporary Traffic Control Plan:</p> <ul style="list-style-type: none"> • Use the City of Portland guidelines identified in Portland's Neighborhood Greenways Assessment Report (Portland Bureau of Transportation 2015) for both daily and hourly traffic volumes to limit vehicle volumes on bikeways. • Monitor and employ traffic diversions to maintain recommended hourly and daily automobile volumes on existing routes and other corridors that serve as bicycle detour routes. • Maintain speed and volumes of traffic at or below the Neighborhood Greenway thresholds for both daily and hourly motor vehicle traffic (Portland Bureau of Transportation 2015). • Prohibit established Neighborhood Greenways from being used as formal motor vehicle detour routes. • Maintain safe and comfortable conditions for people walking, biking, and rolling through the area throughout the construction timeline (consistent with City policies) by providing physical separation from vehicular traffic and implementing traffic calming measures on multimodal detour routes also used by vehicles. <p>Include design details for temporary pedestrian and bicycle facilities (e.g., facility typologies, widths, and signage) in the Temporary Traffic Control Plan.</p> <p>The Project would incorporate best available design standards in accordance with City of Portland requirements to reduce stressful conditions for people who walk, bike, and roll at Project intersections. Refinements to signal timing within the Project Area may shorten bicycle travel times and would be further evaluated during final design phase. As noted in Section 2.1.4, ODOT would continue to refine the design with input from the City as it relates to implementing pedestrian and bicycle policies and design guidance for facilities and operations through the Rose Quarter area. Design refinements that would be explored include adjustments to traffic operations to support keeping crosswalks open. Any potential crosswalk closures would be</p>

³⁴ Pursuant to FHWA Order 6640.23A, the analysis accounted for “mitigation and enhancement measures and potential offsetting benefits to the affected minority and/or low-income populations.”

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	<p>evaluated in coordination with the City of Portland during final design, and approved by the City prior to implementation.</p> <p>Design refinement would also consider moving the transition of the N Williams bike lane from the east side to the west side to a location north of NE Hancock that improves safety and minimizes delay.</p> <p>Where applicable and in compliance with the City of Portland bicycle and pedestrian standards, ODOT would collaborate with the City of Portland to incorporate the following best practices during final design of intersection improvements:</p> <ul style="list-style-type: none"> • Reduce potential bicycle/motor vehicle conflicts through proactive signing, striping, and signal phasing. Provide physical separation and signal timing to separate modes at higher risk intersections. • Include wayfinding signage for crosswalk closures that is accessible to all users, including those who are blind or low vision, people who use lower-profile mobility devices, people who are deaf and hard of hearing, and others. • Review, and remove if necessary, adjacent on-street parking to improve stopping and intersection sight distance. Follow the City of Portland’s Vision Clearance Guidelines for uncontrolled intersections. • Provide intersection turning radii that are consistent with desired interactions between motorists and people who walk, bike, and roll. • Establish signal timing protocols that provide sufficient crossing time. • Provide adequately scaled two-stage³⁵ bicycle turn boxes for left-turn movements at locations where bicycle routes intersect. • To minimize delay for people cycling through the Broadway/Weidler and Vancouver/Williams corridors, consider timing signals for the pace of bicycle travel. <p>Although sidewalk gaps along portions of N Wheeler and N Williams (formerly NE Wheeler segment) would be filled, some existing sidewalk gaps within the API would remain. During the design and construction phases, and where feasible, ODOT would address the remaining gaps in the sidewalk network and crosswalk spacing within the API.</p> <p>The Temporary Traffic Control Plan and design refinements would result in temporary facilities that provide fully accessible, safe, and comfortable routes for people who walk, bike, and roll throughout the API over the course of construction and would aim to preserve or improve the current levels of active transportation in the area. During construction, the Project would prioritize providing the highest level of accommodation for people who walk, bike, or roll. The Project would also include filling gaps in the sidewalk network, with a focus on establishing and maintaining a robust pedestrian network during construction.</p>
Transportation - Safety	<p>In support of the City of Portland’s Vision Zero Action Plan (City of Portland 2016a), the following best practices would be considered for the local street system in consultation with the City of Portland during final design to maximize short-term and long-term safety:</p> <ul style="list-style-type: none"> • Apply best practice design treatments using a Safe Systems Approach identified in the City of Portland’s Vision Zero action plan “Moving to Our Future” (https://www.portland.gov/transportation/director/goal-1), consistent with the U.S. Department of Transportation (https://www.transportation.gov/NRSS/SafeSystem). Treatments are recommended by the Portland Bureau of Transportation, the National

³⁵ The two-stage bicycle turn box is an area set aside for bicyclists to queue to turn at a signalized intersection outside of the traveled path of motor vehicles and other bicycles. When using a two-stage bicycle turn box to make a left turn, a bicyclist would proceed on a green signal indication to the turn box on the right-hand side of the travel lanes, and then turn left within the turn box and wait for the appropriate signal indication on the cross street to proceed. Two-stage bicycle turn boxes can also be used with a left-side bicycle facility to facilitate bicyclists turning right. In addition to mitigating conflicts inherent in merging across traffic to turn, two-stage bicycle turn boxes reduce conflicts between bicycles and pedestrians and separate queued bicyclists waiting to turn from through bicyclists moving on the green signal (FHWA 2017).

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	<p>Association of City Transportation Officials (NACTO), and the American Association of State Highway and Transportation Officials (AASHTO), to integrate transit vehicles, separated bicycle lanes, pedestrians, and motorists on the local road system, specifically as this relates to the potential risks associated with right-turn movements or other potential conflict points between modes.</p> <ul style="list-style-type: none"> • Address conflicts at I-5 SB off-ramp (NE Wheeler/N Williams/N Ramsay); the intersection design considers protected signal phases for bicyclists and pedestrians and extending sidewalk corners to provide shorter crosswalks. • The following documents provide example best practices for transportation facility design for this Project. <ul style="list-style-type: none"> • Portland Protected Bicycle Lane Planning and Design Guide (see https://www.portland.gov/sites/default/files/2022/portland-protected-bicycle-lane-design-guide-v2021-050521-small.pdf) • NACTO Urban Bikeway Design Guide (see https://nacto.org/publication/urban-bikeway-design-guide/) • AASHTO Guidance (see https://safety.fhwa.dot.gov/roadway_dept/countermeasures/reduce_crash_severity/aashto_guidancecfm.cfm) • Portland Pedestrian Design Guide (see https://www.portland.gov/sites/default/files/2022/PBOT%20Pedestrian%20Design%20Guide%202022.pdf) • Portland Traffic Design Manual (see https://www.portland.gov/sites/default/files/2022/pbot-traffic-design-manual-june-2021-update-website-document.pdf) <p>ODOT would require the construction contractor to develop construction and traffic management plans that would be approved by the City of Portland and include best practices for work zone safety to reduce risk to construction workers and the traveling public.</p>
Transportation – Traffic Operations	<p>The following strategies would be implemented by ODOT, as appropriate, to avoid, minimize, and/or mitigate short-term construction impacts to highway drivers and local street road users in all the modes of travel:</p> <ul style="list-style-type: none"> • Require the construction contractor to develop, in consultation with the City of Portland, a comprehensive transportation management plan that documents construction staging and schedule, alternate routes for all modes of travel during road closure, and lane closure restrictions, as well as transportation management and operation strategies (TMOS). Specific TMOS elements may include public information and outreach to encourage changes in travel behavior, provision of real-time information to road users with Intelligent Transportation System technology, and incident/emergency management to detect and remove incidents and restore traffic quickly. • Maintain event access during construction with enhanced TMOS strategies before and after events. ODOT would coordinate with the Moda Center, City of Portland, and Oregon Convention Center to avoid traffic disruptions during major events, to the extent practicable. <p>Specific strategies, including advertising campaigns and funding sources to support TMOS, would be further refined during final Project design.</p> <p>As noted in Section 2.1.4, ODOT would continue to refine the design with input from the City as it relates to local circulation; signal timing at the relocated I-5 SB off-ramp location; and Rose Quarter event access and traffic management. ODOT would coordinate with the Rip City</p>

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	<p>Management and the City to develop appropriate ingress and egress routes and traffic management plans for Moda Center pre- and post-event conditions.</p> <p>ODOT and the City of Portland would evaluate the local intersection configuration and signal timing during the final design phase to determine the most appropriate configuration and timing to address City modal priorities as well as maintaining safe operations on the I-5 ramps.</p>
Transportation - Access	<p>ODOT would work closely with businesses in the Project Area to implement strategies to limit disruption to business access. Temporary signage would be used as needed, and access to businesses during construction would be maintained to the degree possible.</p> <p>Event access would be maintained during construction and could require an increased level of active traffic management before and after events. ODOT would coordinate closely with the Moda Center, City of Portland, and Oregon Convention Center to coordinate major traffic disruptions to avoid major events, to the extent practicable.</p>
Utilities	<p>Proactively addressing special constraints and design considerations to avoid or minimize impacts to major utilities would occur during final design. In particular, impacts to the City of Portland BES 264-inch sewer, sanitary pump station, and pump station piping would need to be minimized or avoided. Additionally, direct impact to the BES 56-inch sewer line that crosses I-5 at N Hancock would be avoided or minimized. Although a cost has been included for impacts to these BES facilities, relocation of these utilities would not be a viable option. ODOT standard process in these instances is to prepare a "Design Acceptance Package" report in the initial stages of design for Project-critical success factors. Obtaining vertical and horizontal limits of these key underground utilities would occur in subsequent phases of the design process for the Revised Build Alternative, and recommended actions to minimize utility conflicts would be included as part of the design acceptance package.</p> <p>Proper coordination and the use of standard construction procedures and techniques would minimize disturbance to system users and avoid damage or impacts to existing facilities that are deemed, during final design, to not require relocation or upgrades. Typically, new facilities such as poles or ducts are installed, and then service is switched over to the new facilities, thereby minimizing any disruption of service to the utility users.</p> <p>Utility coordination would occur in accordance with the ODOT Right of Way Manual, Chapter 11 (ODOT 2018a) and is expected to occur early enough in the development of the Revised Build Alternative to allow new or relocated utilities to be brought on-line prior to any major disruptions from the Revised Build Alternative. Compliance with ODOT guidance should minimize or avoid disruption in service to the utility providers or users. Relocation plans would be prepared and service disruptions approved by affected utility providers before construction begins. Coordination would occur with utility owners to ensure that contingency plans for management of potential utility service disruptions during construction are accommodated.</p>
Water Resources	<p>Potential impacts to water quality during construction would be avoided by requiring contractors to follow standard best management and erosion control practices in the ODOT <i>Erosion Control Manual</i> (2019a), ODOT <i>Standard Specifications</i> (2021), ODOT <i>Boilerplate Special Provisions</i> (2018b), and City of Portland stormwater requirements.</p>

Notes: ACBM = asbestos-containing building material; API = Area of Potential Impact; BES = Portland Bureau of Environmental Services; BMP = best management practices; CFR = Code of Federal Regulations; dBA = A-weighted decibel; DBE = Disadvantaged Business Enterprise; EJ = Environmental Justice; FHWA = Federal Highway Administration; GHG = greenhouse gas; LBP = lead-based paint; I-5 = Interstate 5; NAAC = Noise Abatement Approach Criteria; NRHP = National Register of Historic Places; OAR = Oregon Administration Rules; ODOT = Oregon Department of Transportation; ORS = Oregon Revised Statutes; PA = Programmatic Agreement; PCB = polychlorinated biphenyl; ROW = right of way; SHPO = State Historic Preservation Office; TMOS = transportation management and operation strategies; URA = Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970