

**APPENDIX A**  
PROJECT MITIGATION COMMITMENTS

## Appendix A

### PROJECT MITIGATION COMMITMENTS

#### Introduction

This attachment summarizes the mitigation commitments made by the Federal Highway Administration (FHWA), Federal Transit Administration (FTA) and the Project Sponsors for the Columbia River Crossing Project (Project). These measures are more fully described in Chapters 3 and Appendix L of the Final Environmental Impact Statement (FEIS) and in other supporting documents including the Biological Opinion, the Final 4(f) Evaluation, and the Memorandum of Agreement regarding Historic, Cultural, and Archaeological Resources, and those more detailed descriptions remain in effect.

The Record of Decision (ROD) incorporates these mitigation measures into the definition of the project, and the project sponsors shall implement them, provide funding for their implementation, or ensure that other agencies fund and implement them (although this does not alleviate the project sponsors' overall responsibility for implementation). The project sponsors are prohibited from withdrawing or substantially changing any of the mitigation commitments identified in the ROD for the Project without FHWA's and FTA's written approval. In addition, FHWA and FTA must review and approve any change to the Project that may involve new or changed environmental or community impacts not yet considered in the existing environmental record, in accordance with 23 CFR Part 771.

In addition to outlining the specific mitigation measures required under this ROD, this list is provided here to facilitate the monitoring of the implementation and effectiveness of the mitigation measures and to give a sense of the nature of the mitigation actions and associated impacts. If mitigation measures identified in the FEIS and the other supporting documents identified above are not included in this summary, those mitigation measures are incorporated and included herein.

Mitigation is listed in two categories: long-term, those associated with Project operation, and short-term, those associated with Project construction. Wherever it is feasible and appropriate, mitigation measures that consist of construction methods or practices or involve constructed elements of Project facilities or improvements shall be incorporated in the Project design and specification documents and included as contractual obligations within construction contracts.

In January 2011, the Council on Environmental Quality issued guidance on "establishing, implementing, and monitoring mitigation commitments" in environmental review and decision documents. The guidance reminds agencies that they should document mitigation commitments, and, where warranted, monitor the effectiveness of mitigation. Where appropriate and practicable, the mitigation matrix below describes performance standards or expected results of the mitigation measures. Where it is not practicable to specify performance standards or to define monitoring plans at this level of design, then they will be developed, as needed, during final design and construction. Where warranted, the Project will define the mitigation performance that contractors will be required to achieve on each of the relevant elements of construction-related mitigation listed in the matrix below, and will require contractors to document and report their compliance with these measures, where practicable. The project sponsors will establish and conduct a mitigation monitoring program during final design, construction, and startup with the goals of 1) helping the project sponsors fulfill the commitments set forth in the environmental documents, and 2) giving FHWA and FTA a means of overseeing the effectiveness of and compliance with its mitigation requirements. The monitoring program will consist of four activities:

- Maintaining a current list or database (or matrix) of mitigation commitments by the project sponsors.
- Tracking the status of implementation of the mitigation measures by the project sponsors.
- Reporting on the effectiveness of the mitigation measures implemented.
- Submitting quarterly reports to FTA and FHWA during the construction phase and then thereafter on a regular basis as determined by FTA and FHWA.

## Mitigation Matrix

Impact from the SA	Mitigation or Compensation	Regulatory Driver
<b>3.1 Transportation</b>		
Loss of on-street parking	<p>When on-street parking is removed, City of Vancouver policy calls for replacement parking to be provided within 750 feet. Given the constrained nature of the downtown area, it is very challenging to identify areas for replacement parking that would not displace existing buildings (businesses and residences), travel lanes, parks, or other current uses. Mitigating circumstances include: the existing parking supply is greatly underutilized; and the introduction of light rail will enable greater use of transit and reduce the need for parking space. Mitigation measures include: working with City to attain compliance or partial exemption from City parking policy. Coordination between C-TRAN and the City will occur to consider shared parking use agreements that will allow some use of the new park and ride facilities. An agreement would require prior concurrence from FTA for incidental use. The project team has worked with property owners and the City of Vancouver to identify the following mitigations for the loss of on-street parking:</p> <ol style="list-style-type: none"> <li>1. The addition of 50 stalls within the SR 14 westbound to southbound loop</li> <li>2. The acquisition of the existing city parking lot south of Smith Tower, which will be repurposed to serve Smith Tower residents</li> </ol>	NEPA, Local Ordinances
<b>Transit Safety and Security</b>		
New mode could increase vehicle crashes	<p>Safety measures will be designed into the project, based on AASHTO standards, including:</p> <ul style="list-style-type: none"> <li>*Physical barriers such as medians, fencing, landscaping, or chain and bollard (short, vertical posts) to help channel automobiles, pedestrians, and bicyclists</li> <li>*Signage, tactile pavers, audio warnings, and pavement markings at track crossings to alert individuals they are approaching tracks</li> </ul>	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	<ul style="list-style-type: none"> <li>*Active treatments such as flashing lights, bells, and illuminated and audible warning devices in traffic signals</li> <li>*The creation of inviting, well-lighted platforms and station areas</li> <li>*Maintaining clear sight lines for oncoming trains</li> <li>*Implementing a public safety education campaign before the start of service</li> </ul>	
<p>Bicycle safety could be impacted due to new tracks and stations</p>	<p>The project will provide bicycle access to station locations by perpendicular access streets within each city's bicycle network. Station areas include bicycle facilities, which could include secure storage areas. The Project will coordinate with each governing jurisdiction to determine the appropriate number of bicycle storage facilities per station. Local jurisdictions should consider access to light rail stations as bicycle system plans are updated.</p>	<p>NEPA</p>
<p>Pedestrian safety could be impacted due to new tracks and stations</p>	<p>The Project will provide pedestrian access to stations by establishing "through-walking areas" adjacent to the planned station locations. Through-walking areas are clear pathways free of street furniture or other impediments. The project will maintain these areas at approximately 7 to 8 feet in width in busy pedestrian locations such as downtown and 6 feet in width in areas with lower levels of pedestrian traffic.</p>	<p>NEPA</p>
<p>Potential security issues at new stations</p>	<p>Strategies on crime prevention will be implemented through station environmental design (CPTED) and the use of police, private security patrols, and security cameras as appropriate to make the light rail facilities as safe and secure as possible. TriMet and FTA have existing policies and procedures for operating during a potential catastrophic event and preventing terrorist activities. These policies will be expanded to include the CRC project and C-TRAN. Both TriMet and C-TRAN will maintain a Safety and Security Management Plan. The State Safety Oversight Agency will provide input during final design and provide an oversight function and final sign-off on safety certification prior to revenue service or allowing for the project to go into revenue service. Finally, CRC's light rail design criteria will be used to design platform location and length, pedestrian crossings, and alignment to ensure that the project operates safely.</p>	<p>NEPA, Transit Agency Operating Procedures</p>

Impact from the SA	Mitigation or Compensation	Regulatory Driver
<b>Vancouver Local Street Performance</b>		
<p>*One intersection would not meet operational standards during a.m. peak (two intersections with highway phasing option)</p> <p>*Three intersections would not meet operational standards during p.m. peak</p>	<p>The City of Vancouver and WSDOT, as appropriate, will monitor traffic operations and pursue the following mitigation measures under the SA:</p> <ul style="list-style-type: none"> <li>*Monitor and adjust ramp meter rates at Fourth Plain Boulevard ramps when these are installed in the future. When queuing from the ramp causes either ramp terminal to fail to meet the operational standard, ramp meter rates should be adjusted. Due consideration, but not equal weight, will be given to the local system to minimize queuing from the ramp meter. Emphasis will be on avoiding significant adverse impacts and traffic operational failures on the freeway system.</li> <li>*Add a third lane westbound on 15th Street between Washington Street and Columbia Street. Adding the third through lane will allow the drop lane at 15th Street and Washington Street to become a left/through lane adding additional capacity to the 15th Street corridor. This should be completed at such time as it is necessary to achieve the operational standards along the 15th Street corridor.</li> <li>*Add a southbound right turn lane at 15th Street and Columbia Street. This would be completed at such time as it is necessary to achieve the operational standards at the intersection of 15th Street and Columbia Street.</li> <li>*Add a third eastbound left turn at the Mill Plain interchange when needed in the future. The third eastbound left turn lane should be added when eastbound left turn volumes have increased to a level that causes the interchange to fail to meet acceptable operational standards.</li> <li>*Monitor and adjust ramp meter rates at Mill Plain Boulevard on-ramps if/when these are installed in the future. When queuing from the ramp causes either ramp terminal to fail to meet the operational standard, ramp meter rates would be adjusted. Due consideration, but not equal weight, will be given to the local system to minimize queuing from the ramp meter. Emphasis will be on avoiding significant adverse impacts and traffic operational failures on the freeway system.</li> </ul>	<p>NEPA</p>

Impact from the SA	Mitigation or Compensation	Regulatory Driver
<b>Portland Local Street Performance</b>		
One intersection would not meet operational standards during a.m. peak	<p>TriMet and the City of Portland, as appropriate, will monitor traffic operations and pursue the following measures to mitigate unacceptable operations under the SA:</p> <p>*Going Street and Interstate Avenue:</p> <ul style="list-style-type: none"> <li>*Optimize light rail transit pre-emption at intersection</li> <li>*Install advanced signal controllers to manage light rail transit pre-emption</li> <li>*Change the westbound right lane into a through/right choice lane to allow traffic to continue westbound</li> </ul>	NEPA
<b>Temporary Effects</b>		
<b>Traffic</b>		
Increased congestion on several major traffic facilities in the corridor including I-5 and, potentially, I-205	<p>A variety of activities, ranging from scheduling construction activities to minimize conflicts during peak travel periods to using alternative construction techniques or equipment. Measures will be implemented as appropriate to mitigate the short-term traffic impacts, including:</p> <ul style="list-style-type: none"> <li>*Work with appropriate jurisdictions to obtain approval of traffic control plans and any necessary agreements.</li> <li>*Develop, during final design, and maintain throughout construction a program of coordination with and outreach to affected business and community interests to provide input on the development and implementation of a transportation management plan. This plan will address a variety of traffic, transit, and alternative mode strategies designed to minimize the transportation impacts of project construction. The plan will also identify detour routes.</li> <li>*As part of the outreach program, establish a telephone complaint and information system to be operated throughout the duration of project construction.</li> <li>*Wherever possible or practical, limit or concentrate work areas to minimize disruptions to vehicular traffic and bus and pedestrian circulation, as well as to business access.</li> <li>*Identify, provide and/or advertise temporary parking locations to replace parking temporarily displaced by construction.</li> <li>*Relocate affected loading zones, property accesses, bus stops, and other specially designated parking and access points before construction begins to allow new traffic patterns to be established.</li> </ul>	NEPA
Impacts resulting from traffic relocations or detours		
Full or partial street closures		
Increased truck traffic associated with construction activity		
Intrusion of non-local traffic into residential areas as a result of temporary street closures and traffic detours		
Disruptions to vehicular and pedestrian access to businesses and community services		
High levels of truck traffic are anticipated in connection with earthwork and the delivery of materials at the bridge crossings, freeway mainline segments, and interchanges.		

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	<p>*As appropriate, develop and implement functional and reasonable alternative construction techniques to minimize traffic impacts.</p> <p>*The project will maintain paratransit services for qualifying, mobility-impaired Hayden Island residents and will maintain construction period shuttle service on the island when needed.</p> <p>*The project will implement a TDM program to address traffic impacts during construction.</p>	
<b>Transit</b>		
Temporary loss of on- or off-street parking	*Mitigation measures will be instituted where bus routes are impacted to provide service that is comparable to non-construction periods.	
Transit service delays		
Relocation or temporary elimination of bus stops	*Working with the two transit agencies, Transportation Management Associations (TMAs), and other organizations, the project will conduct a communications campaign to inform the public about these transit changes. Associated mitigation measures will be developed by the ODOT, WSDOT and transit agencies on both sides of the river. These agencies will communicate the new routing, the potential for more crowded buses and slower travel times, and mitigation measures through TV, radio, email, a Web site, newspapers, and other multimedia instruments to broadcast rider alerts to potentially impacted customers.	
Rerouting of bus routes		
Deterioration in reliability for bus routes using affected roadways and facilities within the corridor	<p>*The temporary effects of bridge, highway and light rail construction near downtown Vancouver and on Hayden Island will require mitigation for fixed bus routes:</p> <p>*The same communication campaign of rider alerts will be made for both C-TRAN and TriMet buses for all of these mitigation measures.</p> <p>*However, buses currently running south on Broadway will be permanently relocated to either Columbia or C Streets.</p>	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	<p>*The new routing through downtown Vancouver will receive new signs and temporary bus stops. Rider alerts will be made through a communications campaign via the Internet, email, and hard copy postings on buses and at service stops.</p> <p>*Bus routes needing temporary relocation will receive temporary benches and shelters at service stops, depending on the duration of relocation (any relocation greater than 6 months would warrant such treatments) and the number of boardings per day.</p> <p>*During construction, affected transit stops will be temporarily relocated to the nearest possible location on the same transit route without interfering with the construction process.</p> <p>*Temporary sidewalks, pathways and/or detours will be provided to replace any sidewalks and/or trails adjacent to the project that are affected by construction. To help minimize on-street parking impacts, temporary parking will be identified to mitigate the temporary loss of specific on-street parking due to construction.</p> <p>*Mitigated parking losses will include displaced spaces reserved for disabled motorists, spaces identified as critically important to businesses for which no reasonable alternative exists, and others. Business access will be maintained during light rail construction. During previous light rail transit construction projects, TriMet has kept construction disruption to a minimum while maintaining access to businesses and has rapidly responded to concerns and potential issues. Mitigation of short-term impacts to businesses during transit construction can be accomplished through a number of activities.</p>	
<p>Impacts to bike/pedestrian mobility</p>	<p>*Disseminate information about construction, closures and detours.</p> <p>*Temporary enclosures, as appropriate, to provide for the safety of bicyclists and pedestrians traveling beneath structures under construction.</p> <p>*If it is not possible to maintain existing bicycle lanes within the work zone, provide alternate routes.</p>	<p>NEPA</p>



Impact from the SA	Mitigation or Compensation	Regulatory Driver
<b>3.2 Aviation and Navigation</b>		
<b>Navigation</b>		
Maximum vertical clearance reduced from 179 feet to 95 feet.	*Complete a boat survey and comply with Section 9 permit terms and conditions. More detailed information will be gathered as part of the Section 9 permit process regarding users that cannot pass through the proposed 95 foot vertical clearance without partial disassembly of their cargo. Mitigation will be evaluated based on the information obtained.	Section 9 Rivers and Harbors Act - USCG
<b>Aviation</b>		
Intrusion into Pearson Field airspace	*Roadway or accent lighting will be designed to limit light or glare that could affect air navigation, and will comply with FAA permit terms and conditions. *The SA will improve safety over the No-Build alternative; therefore, no additional mitigation is necessary.	FAA Form 7460-1 Notice of Proposed Construction or Alteration
Stormwater ponds and structures located within 5,000-foot zone around runways may attract birds	*Stormwater ponds within 5,000-foot zone around runways will include features to discourage birds from utilizing the ponds. *Structures will be designed to minimize locations for birds to roost or nest.	
<b>Temporary Effects</b>		
River navigation impacts due to blockages from construction barges and activities	*At least one river navigation channel will remain open during construction *Restrictions on river travel will be communicated in advance to users of the river, through means determined in coordination with the USCG *Notices will be provided to tug operators, pilots and general public *Additional tugs may be provided where needed to aid in temporary navigation *Conditions of the Section 9 Coast Guard permit will be incorporated into construction contract specifications as applicable	Section 9 Rivers and Harbors Act - USCG
Tall cranes would intrude into Pearson Field airspace	*Obstruction marking and lighting to make construction equipment visible to aircraft. This requirement will be written into the contractor's contract specifications.	FAA Form 7460-1 Notice of Proposed Construction or Alteration
Construction dust or emissions could pose a short-term aviation hazard by reducing visibility	*Construction materials and activities will be managed to minimize dust, glare and exhaust using appropriate technologies available at the time of construction.	FAA Form 7460-1 Notice of Proposed Construction or Alteration

Impact from the SA	Mitigation or Compensation	Regulatory Driver
<b>3.3 Property Acquisitions and Displacements</b>		
Permanent property acquisitions both full and partial	*Purchase property or property right for fair market value as determined through an appraisal.	Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended (Uniform Act)
Permanent easements	*Purchase property or property right for fair market value as determined through an appraisal.	Uniform Act
Displacement of publicly-owned facilities	*Relocation assistance or functional replacement	Uniform Act
Displacement of floating homes in North Portland Harbor	*The floating homes will be purchased at fair market value and the occupants will be provided relocation assistance.	Uniform Act
Displacement of other residences	*Purchase property at fair market value and provide relocation assistance.	Uniform Act
Displacement of 30+ businesses on Hayden Island	*Purchase property at fair market value and provide relocation assistance.	Uniform Act
Displacement of Safeway on Hayden Island	*Purchase property at fair market value and provide relocation assistance.	Uniform Act
Displacement of marine businesses on North Portland Harbor	*Purchase property at fair market value and provide relocation assistance.	Uniform Act
Displacement of other businesses	*Purchase property at fair market value and provide relocation assistance.	Uniform Act
Displacement of shared light industrial and residential uses at Ruby Junction	*Purchase property at fair market and provide relocation assistance. *Possibly assist in search for suitable residential/industrial properties.	Uniform Act
Accesses closed/modified	Where property access is deemed not adequate, evaluate impact under the Uniform Act and compensate if required.	Uniform Act
<b>Temporary Effects</b>		
Blockage of property access during construction	*Provide continued access to properties during construction, maximized to the extent possible.	Uniform Act
Temporary use of property via easements	*Payment to property owners in exchange for the use of their property during construction	Uniform Act
<b>3.4 Land Use and Economic Activity</b>		
No long-term, direct impacts to mitigate.		
<b>Temporary Effects</b>		
Loss of easy access to some businesses during construction; potentially reduced patronage during construction due to reduced access and visibility	Mitigation measures will be provided by the DOTs, TriMet or the construction contractor, and will be specified in a business access mitigation plan, including:  *Maintaining physical access to businesses  *Providing signs to identify the location of access points to businesses during detours or closures	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	<ul style="list-style-type: none"> <li>*Contractors will coordinate schedule, pace and order of construction to minimize impact to nearby businesses</li> <li>*Identify local businesses to provide services during construction</li> <li>*The City of Vancouver is planning to establish a Growth and Transportation Efficiency Center. This center will be charged with improving transportation efficiency and will develop and administer a construction communication and mitigation plan, which will be funded by ODOT and WSDOT as mitigation for project impacts.</li> </ul> <p>Implementation of programs to help businesses during construction such as:</p> <ul style="list-style-type: none"> <li>*Business planning assistance</li> <li>*Marketing and retail consulting</li> <li>*Promotions to generate patronage in construction areas</li> </ul>	
<p>Effects to freight during construction</p>	<ul style="list-style-type: none"> <li>*At least one river navigation channel will remain open during construction.</li> <li>*Signs will be posted to encourage commercial freight vehicles not serving destinations in the Portland-Vancouver I-5 corridor to shift from I-5 onto I-205 during construction.</li> </ul>	<p>NEPA</p>
<p><b>3.5 Neighborhoods and Environmental Justice</b></p>		
<p>Impact of toll collection system (transponders) for low-income travelers and limited-English-proficiency travelers. Also, toll is higher portion of income for low-income drivers, but this is offset by project benefits. Neither of these is a disproportionate high and adverse effect.</p>	<p>A variety of methods will improve low-income drivers' access to transponders used by the electronic tolling system. To mitigate for low-income and minority populations that need to purchase transponders, CRC will:</p> <ul style="list-style-type: none"> <li>*Provide information about transponders in multiple languages.</li> <li>*Public buildings, including city and county offices, will be used to allow lower income and minority communities to acquire transponders.</li> <li>*Enable people without credit cards or checking accounts to obtain transponders by paying with cash or Electronic Benefit Transfer (EBT) (Quest) cards, which are issued for federal program benefits. WSDOT has coordinated closely with other agencies in Washington State, and the EBT Quest cards can be used for transponder acquisitions. ODOT will work to enable the Oregon Trail Cards to be used for transponder acquisition in Oregon.</li> <li>*Share information with and through other public service providers.</li> <li>*Train social service workers with information about the tolling system.</li> </ul>	<p>NEPA, EJ EO</p>

Impact from the SA	Mitigation or Compensation	Regulatory Driver
Displacement of Safeway and bottle return center	<p><i>See Property Acquisitions section regarding Safeway displacement</i></p> <p>*Provide on-site notice and information regarding the closure of the bottle return center, including directions to other locations on the island that accept returns, and directions to larger, off-island bottle return centers.</p>	Uniform Act
Displacement of service industry jobs due to displacement of businesses	<p>*For loss of service industry jobs, mitigation measures will consist of programs developed prior to construction to promote the use of local workers by utilizing apprenticeship and job training programs. Federal funding rules do not allow for preferential treatment in contracting based on locality. However, the project will provide outreach to local contractors and existing job training programs. A monitoring and evaluation program would be necessary to track these measures through final design, construction, and operation for the facilities to ensure the benefits of promoting participation from contractor minority-owned businesses are realized.</p>	NEPA
Adverse impact to an EJ population due to the Ruby Junction expansion which displaces homes and home-based businesses. This impact would include disproportionate numbers of minority households.	<p><i>See Property Acquisitions section</i></p>	Uniform Act
Displacement of floating homes in North Portland Harbor	<p><i>See Property Acquisitions section</i></p>	Uniform Act
Displacement of homes and businesses in Vancouver	<p><i>See Property Acquisitions section</i></p>	Uniform Act
Increased transit noise on streets with residences	<p><i>See Noise section</i></p>	NEPA
Increased traffic noise in neighborhoods	<p><i>See Noise section</i></p>	NEPA
Impacts to Marshall Community Center and Park and Luepke Senior Center	<p><i>See Park and Recreation section</i></p>	NEPA
Displacement of existing buildings and surface parking within the Clark College Annex area and displacement of some trees and landscaping	<p><i>See Public Services section</i></p>	NEPA
Impacts to Waterfront Park	<p><i>See Parks and Recreation section</i></p>	NEPA
<b>Temporary Effects</b>		
Construction effects to neighborhoods and EJ populations	<p>*Provide detours that minimize out-of-direction travel and delays for travelers, and minimize cut-through traffic.</p> <p>*Maintain transit service where possible throughout the construction phase.</p> <p>*Use best management practices to reduce noise, dust, and vehicle emissions during construction.</p>	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	<p>*Use existing or newly acquired right-of-way for construction staging to minimize additional temporary property acquisitions.</p> <p>*Communicate information and obtain feedback about construction activities, impacts and mitigation throughout neighborhoods, including focused outreach to limited-English-proficiency populations.</p> <p>*Restrict haul routes from sensitive locations, such as schools, nursing homes, etc.</p>	
<b>3.6 Public Services and Utilities</b>		
Displace ODOT permit center	Provide compensation under the Uniform Act, as required.	Uniform Act
Displace Clark Public Utilities building near SR 14	Provide compensation under the Uniform Act, as required.	Uniform Act
Displace parking, landscaping, illumination and electronic swing gate at FHWA offices	Provide compensation under the Uniform Act, as required. Mitigation may include, but not be limited to, restriping of parking lot and any other impacts to the subject property.	Uniform Act
Displace Clark College Annex structures, parking and landscaping	*Landscape screening buffer between the new park and ride and the fields, and a pedestrian connection from the parking area to the fields.	Uniform Act
Impacts to intersections on critical access routes	<i>See Transportation section in this matrix for description of mitigation for intersections</i>	NEPA
<b>Temporary Effects</b>		
Construction-related congestion on I-5 and local streets	<p>*Provide information regarding construction to service providers.</p> <p>*During construction, as emergency responders monitor response times, if unacceptable delays are occurring due to construction, WSDOT and/or ODOT will meet with emergency service representatives to address construction concerns and develop solutions for better detour route communication.</p> <p>*ODOT and WSDOT will coordinate with emergency service providers to maintain emergency access during construction and through construction zones.</p>	NEPA
Utilities may be affected by construction	*To maintain services, temporary utility relocation and/or staging, and sequencing provisions for the construction of new structures and demolition of the existing structures will occur prior to the start of project construction.	NEPA
Service outages during construction.	*Work closely with utility service providers to reduce the number and extent of service outages during construction or relocation activities and to provide advance notice when such outages might occur.	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
<b>3.7 Parks and Recreation</b>		
<p>Permanent acquisition of 4.2 acres of parks and recreation resources; this includes 1.4 acre from VNHR, 1.0 acre of Clark College recreation fields, 0.6 acre of Marshall Community Park (including 0.1 acre of FLP land), 0.4 acre of Waterfront Park, 0.3 acre of Kiggins Sports Fields, 0.3 acre of Leverich Community Park, and less than 0.1 acre of temporary use at East Delta Park.</p>	<p>The following measures will be employed:</p> <ul style="list-style-type: none"> <li>*Purchase property at fair-market value per the Uniform Act.</li> <li>*Return 6(f) parkland temporarily occupied during construction to its original condition and recreational utility or better. Make sure nonconforming temporary use lasts less than 180 days (6 months) or a permanent acquisition will occur. Document agreement between FHWA and Portland Parks and Recreation that impact does not constitute a conversion.</li> <li>*Replace Federal Lands to Parks land acquired with adjacent substitution parcel of equivalent or greater market value and recreational utility.</li> <li>*Transfer portion of vacated state right-of-way beneath the existing I-5 bridge landings in Vancouver for City's planned Waterfront Park redevelopment.</li> </ul>	<p>Uniform Act; Section 4(f) of USDOT Act; Federal-Lands-to-Parks; Section 4(f) of USDOT Act (23 CFR 774); RCO Manual 7/ Section 4(f) of USDOT Act</p>
<p>Reduction of on- and off-street parking for park and recreation visitors, including parking at Marshall Community Center, Marshall Park, Luepke Senior Center, and Clark College Recreation Fields</p>	<p>The following measures will be employed:</p> <ul style="list-style-type: none"> <li>*Restripe parking lot to provide for lost spaces or change access points to allow for drop-off areas.</li> <li>*Provide signage indicating parking at Marshall Park is reserved for patrons of the park.</li> <li>*Explore potential incidental use agreement for park and ride.</li> </ul>	<p>NEPA; Section 4(f) of USDOT Act (23 CFR 774)</p>
<p>Increased noise levels at some parks</p>	<p><i>See Noise section</i></p>	<p>NEPA</p>
<p>Removal of trees and vegetation from parks in Vancouver</p>	<p>Implementation of tree replanting and re-vegetation; in most cases trees will be replanted in the same or similar location as the trees removed, where possible.</p>	<p>City of Vancouver Tree Removal permitting process</p>
<p>Changes in views to and from parks</p>	<p><i>See Visual section</i></p>	<p>NEPA</p>
<p>Displacement of Public Art from Waterfront Park</p>	<p><i>See Visual section</i></p>	<p>NEPA</p>
<p>Permanent realignment of 550 feet of trails</p>	<p>*Trail access and continuity will be restored and replaced. There will be an overall improvement in trail access and facilities.</p>	<p>NEPA; Section 4(f) of USDOT Act (23 CFR 774)</p>
<b>Temporary Effects</b>		
<p>Temporary property easements for construction access</p>	<p>*Compensate owner and restore site after use.</p>	<p>NEPA</p>
<p>Increased noise, glare, dust, and vibration during construction</p>	<p><i>See Visual, Noise and Vibration, and Air Quality sections</i></p>	
<p>Construction-related changes to access or traffic operations (closures, detours, and congestion) could delay or deter park users</p>	<p>The following measures will be employed:</p> <ul style="list-style-type: none"> <li>*Provide adequate signage for any limited or closed access points and detour routes.</li> <li>*Provide resources for a joint public information campaign with parks jurisdictions for some of the longer closures.</li> </ul>	

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	<p>*Maintain safety for bicyclists and pedestrians traveling on trails and between facilities with temporary protection.</p> <p>*Additional signage and lighting if deemed necessary by project sponsors based on comments by users.</p>	
<p>Bridge construction activities would temporarily restrict some recreational use of the river</p>	<p>*River users will be provided with a safe passage or detour. The safe passage criteria will be developed through coordination with the Coast Guard.</p>	<p>NEPA</p>
<p>Trees and vegetation in construction area would be removed during construction</p>	<p>Implementation of tree replanting and re-vegetation; protection of trees that are close to construction activities but not displaced (per VMC 20.770.090)</p>	<p>VMC 20.770.090</p>
<p>Traffic rerouting could increase traffic along Columbia Way and Lower River Road. Traffic rerouting could pose an increased risk to bicyclists traveling along these popular routes</p>	<p>Implementation of additional signage and/or lighting, to provide reasonable safety and security for pedestrians and bicyclists.</p> <p>*Maintain safety for bicyclists and pedestrians traveling on trails and between facilities with temporary enclosures or clear passage.</p> <p>*Disseminate information about construction, closures and detours.</p> <p>*On posted traffic detours, add signage along bicycle routes that may experience an increase in vehicle traffic and an associated increased potential for vehicle and bicycle interactions,</p> <p>*Provide separate queuing space for bicycles and traffic calming measures in work zones to improve safety for bicyclists.</p>	<p>NEPA</p>
<p><b>3.8 Historic and Archaeological Resources</b></p>		
<p>Removal of 1917 NRHP-listed bridge</p>	<p>*Prepare a Bridge Marketing Plan that will ensure that all appropriate efforts will be attempted to find an alternative use including separating and relocating individual spans if relocation of the bridge in its entirety is not feasible.</p> <p>*Complete Historic American Engineering Record documentation consisting of a context statement; a minimum of 40 large format photographs; aerial perspective photographs; construction design plans, as-built plans, and narrative documentation of distinctive attributes.</p> <p>*Distribute HAER documentation to local libraries, museums, educational, and historic institutions as listed in the Section 106 MOA.</p> <p>*Salvage and develop a plan for reuse of decorative or character-defining elements of the existing bridges</p> <p>*Develop an interpretive program including a web page and printed materials. Promote access to and make these materials widely accessible.</p> <p>*Develop Multiple Property Documentation for the remaining bridges along the old Pacific Highway in Oregon. Develop a National Register of Historic</p>	<p>Section 106 of NHPA</p>

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	<p>Places (NRHP) nomination for an individual, notable resource in Oregon.</p> <p>*Revise and update previous Multiple Property Documentation for bridges constructed in Washington and determined eligible for the NRHP. For at least one bridge, an individual NRHP nomination will be developed.</p>	
Removal of Pier 99 Building in Oregon	<p>*Complete Historic American Building Survey documentation consisting of a context statement; a minimum of 20 large format photographs; aerial perspective photographs; construction design plans, as-built plans and narrative documentation of distinctive attributes.</p> <p>*Distribute HAER documentation to local libraries, museums, educational, and historic institutions as listed in the Section 106 MOA.</p> <p>*Salvage and develop a plan for reuse of decorative or character-defining elements of the building.</p> <p>*Develop an interpretive project including printed materials. Promote access to and make these materials widely accessible.</p> <p>*Develop Multiple Property Documentation for postwar boat and automobile dealership showroom buildings in the greater Portland area. An individual NRHP nomination will be developed for at least one notable postwar resource.</p>	Section 106 of NHPA
Vancouver National Historic Reserve (and associated district) land acquisitions, visual, noise, cultural landscape	<p>*In close coordination with the NPS and the City of Vancouver, design and construct landscaping and interpretive elements of the Evergreen Community Connector.</p> <p>*Develop a Construction Vibration and Settlement Management and Monitoring Plan for areas near the Post Hospital.</p> <p>*Develop a Visual Management Plan or work with visual elements of an existing VNHR management plan addressing visual effects.</p> <p>*Provide funding for the design and the renovation of Building 405 into a fully operational curation facility.</p>	Section 106 of NHPA
Visual impact to Clark County Historic Museum (Carnegie Library at 1511 Main Street)	*Develop design treatments and approaches for the Mill Park and Ride that will be compatible with the adjacent, historic Carnegie Library building.	Section 106 of NHPA
Noise impacts to NRHP-eligible homes on 17th Avenue	*Provide window improvements and/or air conditioning for residential sound insulation in accordance with the Secretary of Interior Standards for Rehabilitation.	Section 106 of NHPA and NEPA
<b>Temporary Effects</b>		
Disruption to downtown Vancouver may have an effect on the economic viability of the historic commercial buildings. During construction, the economic viability of the businesses in the downtown historic buildings would likely diminish because of access and parking issues.	<i>See Land Use and Economic Activity section</i>	NEPA



Impact from the SA	Mitigation or Compensation	Regulatory Driver
Potential for construction-related impacts to two historic structures: the Barracks Hospital building and Clark County Museum	*WSDOT, in consultation with NPS and the City of Vancouver, will develop a Construction Vibration and Settlement Management and Monitoring Plan that will 1) define a pre-construction analysis of vibration and settlement analysis to determine effect thresholds and appropriate measures that might be needed to minimize vibration and settlement risks during construction, 2) define vibration and settlement monitoring and analysis methods to be used during construction and protective response procedures if adverse effects to structural and/or material integrity occur and/or appear imminent.	
Potential for construction-related impacts to VNHR (noise, night-work lighting)	*Cultural Resources MOA will include recommended management practices, with necessary corrective action taken, intended to mitigate temporary noise and light impacts, and other mitigation as required in the MOA.	
Temporary construction easements for construction throughout the project area	*Construction specifications will require that properties be restored to landowners in similar condition after construction is complete.	
Construction could impact archaeological resources	<p>The following measures will be employed:</p> <ul style="list-style-type: none"> <li>*Develop an Archaeological Treatment Plan addressing methods for integrated rapid data recovery; mitigation for impacts to sites considered significant under criteria A, B, and C; and curation and interpretive methods.</li> <li>*Update the 2009 Inadvertent Discovery Plan addressing archaeological resources not previously identified in the Treatment Plan, and the treatment of human remains.</li> <li>*In advance, test landforms identified as having the potential for supporting archaeological remains.</li> <li>*Monitor during project construction.</li> <li>*Test for archaeological sites potentially buried in the deep sediments that have accumulated along the south shore of the Columbia River.</li> <li>*Disposition of any artifacts or samples recovered during archaeological investigations or during construction will be determined in consultation with agencies, property owners, and appropriate tribes, with consideration given to feedback from other interested parties.</li> <li>*Curation of recovered materials is an essential element of archaeological investigations and is required as part of federal and state permitting processes.</li> </ul>	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
<b>3.9 Visual and Aesthetics</b>		
General intrusion of CRC project on views	<p>The following techniques will be employed to improve or offset the visual effects of the CRC project. Plans and specifications to be determined during final design:</p> <ul style="list-style-type: none"> <li>*Plant vegetation, street trees, and landscaping for screening or visual quality.</li> <li>*Design landscape plans and other visual treatments consistent with adopted guidance and plans.</li> <li>*Shield station and facility lighting from nearby residences and the night sky.</li> <li>*Minimize structural bulk, such as for ramps and columns.</li> <li>*Minimize the number of pier columns in the SR 14 interchange design.</li> <li>*Design architectural features to blend with the surrounding community context.</li> <li>*Place public art (to be relocated when necessary and added as part of transit stations and gateways).</li> <li>*Integrate lighting with facilities in a manner that produces a positive visual and aesthetic impact, reduces night-sky light pollution, reduces possible light trespass into residential units, and contributes to crime prevention through environmental design (CPTED).</li> <li>*Utilize UDAG Design Guidelines, as well as those of both cities and the transit agencies.</li> <li>*Select new and replacement pole and utility cabinet locations, colors, and styles in relation to their context and in accordance with municipal lighting standards.</li> </ul>	NEPA
<b>Columbia River</b>		
Visual change due to higher bridges and ramps; removal of bridge towers	<p>*The proposed bridge design will present less visual clutter for skyline or horizon views while maintaining the drama (vividness) that large-span bridges add to views. A potential lighting scheme, to be determined in final design, will contribute to vividness in the corridor. With indirect lighting, it will help to minimize light trespass.</p>	NEPA
Addition of piers for ramp bridges and local multimodal bridge in North Portland Harbor		
<b>Vancouver National Historic Reserve</b>		
Specific views would experience a high degree of change, including views from the Hudson's Bay Company Village and Post Hospital.	*A screening and landscaping plan for the Village area will be developed in consultation with the National Park Service. See section below regarding Community Connector.	NEPA
Light rail stations, facilities would visually alter existing views on streets	*Each transit station will be designed with consistent design treatments that tie facilities together. Each	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	transit station and park and ride will be the subject of a design process incorporating relevant guidelines, which will include UDAG guidelines and design guidelines from both cities, C-TRAN, the Central Park Plan, downtown stakeholders, and the general public.	
Transit bridge "landing" in Vancouver: The landing would require a very large, solid footing that would occupy much of a block of Washington Street.	Will include robust landscaping, public art, or other façade treatments for the walls of the structure.	
<b>Park and Rides</b>		
Clark Park and Ride structure would be inconsistent with mid-rise buildings of nearby campus.	*Will meet city design guidelines. *The public and technical process will inform decisions on façade treatments, landscaping, lighting, and the mix of uses.	NEPA
Mill Plain Park and Ride would be inconsistent with existing single-story surroundings, but consistent with the projected levels of development in the Vancouver City Center Vision Plan.		
<b>Highway Footprint</b>		
On Hayden Island, the SA highway's mainline footprint will be wider than existing facility.	*The final design of the Hayden Island interchange will support and be consistent with the City of Portland's Hayden Island Plan, utilize the UDAG design guidelines, and incorporate local input.	NEPA
In Vancouver, right-of-way is only slightly wider than existing; visual experience to and from the highway would be substantially altered as sloped landscaped edges become landscaped walls	*A lid over I-5 (the Evergreen Community Connector) has been conceptually developed as part of the project. With the lid, the change in visual character and quality would be substantially different from the existing views. The experience for I-5 motorists will also be very different. Though the connector is not mitigation itself, its design and features will enhance the visual experience for pedestrians.	
<b>Indirect Effects</b>		
Potential development could have beneficial or adverse impacts on historic properties.	<i>See Historic and Archaeological Resources section</i> *Since indirect impacts on views are anticipated to be neutral or positive, no additional mitigation is necessary.	NEPA
<b>Temporary Effects</b>		
Construction-related equipment visible	*When practicable, locate construction equipment and stockpile materials in less visually sensitive areas (as defined in WSDOT and FHWA guidelines) and in areas not visible from the road or to residents and businesses in order to minimize visual obtrusiveness.	NEPA
Vegetation removed for construction	*Revegetation	
Lighting for nighttime construction could affect residential areas	*Shield construction site lighting to reduce spillover of light onto nearby residences and businesses.	
Off-site staging, Port of Vancouver Parcel 1A—low degree of visual change	*Shield construction site lighting to reduce spillover of light onto nearby residences and businesses	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
Off-site staging, Red Lion Hotel site— moderate degree of visual change	*When practicable, locate construction equipment and stockpile materials in less visually sensitive areas (as defined in WSDOT and FHWA guidelines), and in areas not visible from the road or to residents and businesses in order to minimize visual obtrusiveness.	
Off-site staging, Old Thunderbird Hotel— high degree of visual change		
<b>3.10 Air Quality</b>		
No long-term, direct impacts to mitigate.		
<b>Temporary Effects</b>		
<p>Generation of dust from construction activities, direct exhaust emissions from construction equipment, and exhaust emissions from a temporary increase in congestion on the mainline highway and local streets in the project area. Traffic congestion increases idling times and reduces travel speeds, resulting in increased vehicle emission levels.</p>	<p>*Construction mitigation will focus on controlling dust and exhaust emissions from demolition and construction activities and on minimizing the effects of traffic congestion. The contractor will be required to develop a pollution control plan that includes documentation of operational measures that will be used to reduce emissions. Section 290 of the Oregon standard specifications describes requirements for environmental protection, including air pollution control measures.</p> <p>*Haul routes will be restricted from sensitive receptors such as schools, nursing homes, hospitals, etc.</p> <p>*Contractors are required to comply with Oregon standard specifications (Section 290) for dust, diesel vehicles, and burning activities described above. Section 290 requires contractors to comply with Oregon Revised Statutes (ORS) 468 and 468A, Oregon Administrative Rules (OAR) 340-014 and OAR 340-200 through OAR 340-268, and all other applicable laws. In order to control dust, the project will require all contractors to develop and implement a dust control plan and to maintain air quality permits on all portable equipment.</p> <p>*Follow Oregon’s specifications for truck staging areas for diesel-powered vehicles—should be located where truck emissions have a minimum impact on sensitive uses such as residences, schools, hospitals and nursing homes. Trucks and other diesel-powered equipment will limit idling to 5 minutes when the equipment is not in use or in motion or in a limited set of additional circumstances.</p> <p>*In Vancouver, Washington Administrative Code (WAC) 173-400-040 places limits on fugitive dust that causes a nuisance or violates regulations. In addition to compliance with WAC, WSDOT will voluntarily comply with Oregon’s standard specifications related to air quality for work performed in Washington.</p> <p>*Diesel construction vehicles and equipment will use ultra-low sulfur diesel or will otherwise comply with any new regulations in place at the time of construction. In addition, ODOT and WSDOT are evaluating potential additional emission control technologies for</p>	<p>Section 290 of the ODOT standard specifications and ORS 468 and 468A, OAR 340-014 and 340-200 through 340-268. Washington Administrative Code (WAC) 173-400-040</p>

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	<p>construction equipment. ODOT and WSDOT will continue to monitor and evaluate changes in technology and related regulations. Decisions regarding any additional emission controls will be made during final design.</p> <p>*WSDOT and ODOT will work with neighborhoods and vulnerable populations to address their air quality concerns as the project moves into final design and then into construction.</p>	
<p>Off-site staging and casting: Construction of concrete structures or asphalt paving activities may require equipment or operations that will emit pollutants.</p>	<p>Stationary sources, such as concrete mix and asphalt plants, are required to obtain an Air Contaminant Discharge Permit from either DEQ or SWCAA and to comply with regulations for controlling dust and other pollutant emissions.</p>	<p>Air Contaminant Discharge Permit from either DEQ and/or SWCAA</p>
<p><b>3.11 Noise and Vibration</b></p>		
<p>Highway noise impacts</p>	<p>Noise walls, where reasonable and feasible, along highway right-of-way, to comply with WSDOT and ODOT noise manuals.</p>	<p>23 CFR 772, WSDOT Traffic Noise Analysis and Abatement Policy and Procedures, ODOT Noise Manual</p>
<p>Moderate transit and local road noise impacts to floating homes</p>	<p>Sound barriers along portions of the elevated local multimodal bridge structure where noise impacts would occur, based on final design, and where found to occur after initiation of operations</p>	<p>FTA Transit Noise and Vibration Impact Assessment Report</p>
<p>Moderate transit noise impacts to single family residences, including warning bell at crossing gate. Additional residential properties may be identified during final design.</p>	<p>Implement the following measures:</p> <ul style="list-style-type: none"> <li>*Residential sound insulation, as noted in the FEIS (see attached map Figures A-4 to A-5 for illustration of impacted properties).</li> <li>*Warning bell equipped with direction shrouds</li> <li>*Track curves with a radius of 300 feet or less, or where otherwise needed, equipped with wayside lubricators</li> <li>*Sound barriers, as noted in the FEIS (see attached map Figures A-1 to A-5)</li> <li>*Special trackwork crossovers and turnouts, as noted in the FEIS</li> </ul>	<p>FTA Transit Noise and Vibration Impact Assessment Report</p>
<p>Transit vibration impacts</p>	<ul style="list-style-type: none"> <li>*Rail boots installed along the entire embedded track portion of alignment</li> <li>*Minor modifications to the existing rail track and electrical system on the Steel Bridge</li> <li>*Ballast mats where impacts are considered significant</li> <li>*Resilient fasteners and rail boots where impacts are considered significant</li> <li>*Tire-derived aggregate where found to be effective and impacts are considered significant</li> <li>*Special trackwork at crossovers and turnouts (such as spring-rail, flange-bearing, or moveable-point frogs) where impacts are considered significant</li> </ul>	<p>FTA Transit Noise and Vibration Impact Assessment Report</p>

Impact from the SA	Mitigation or Compensation	Regulatory Driver
<b>Temporary Effects</b>		
General construction can result in noise and vibration effects to surrounding receivers near project area.	Whether in Oregon or Washington, contractor will comply with state and local standard specifications relating to noise.	WAC 173-60, Section 290 of the ODOT standard specifications, Portland Municipal Code, Vancouver Municipal Code
Vibration generated by general construction can result in vibration effects to surrounding receivers.	Contractor will perform vibration monitoring of all activities that are expected to produce vibration levels at or above 0.5 inch per second, where practicable. If vibration levels approach this standard, alternate construction methods will be employed, as needed, to avoid vibration-related damage.	NEPA
<b>3.12 Energy</b>		
No long-term, direct impacts to mitigate.		
<b>Temporary Effects</b>		
SA construction would require 11.48 million mBtus of energy	<p>A variety of measures will reduce energy consumption during construction. As the project advances in design and more detail becomes available, additional analysis will help further identify specific measures and approaches for reducing energy consumption during construction. Mitigation measures to be employed:</p> <ul style="list-style-type: none"> <li>*Reuse and recycle construction materials where feasible and practicable.</li> <li>*Encourage workers to carpool or use transit.</li> <li>*Turn off equipment when not in use to reduce energy consumed during idling.</li> <li>*Maintain equipment in good working order to maximize fuel efficiency.</li> <li>*As practical, route truck traffic through areas where the number of stops and delay times will be minimized, and use off-peak travel times to maximize fuel efficiency.</li> <li>*As practical, schedule construction activities that would temporarily hinder traffic flow to be conducted during off-peak hours when traffic volumes are considerably lower.</li> <li>*As practical, schedule construction activities during daytime hours or during summer months when daylight hours are the longest to minimize the need for artificial light.</li> </ul>	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
<b>3.13 Electric and Magnetic Fields</b>		
No impacts to mitigate.		
<b>3.14 Water Quality and Hydrology</b>		
<b>Water Quality</b>		
The SA would slightly increase pollution generating impervious surface area, but greatly decrease the amount of untreated impervious surface area. The SA would decrease anticipated pollutants entering all surface water features in the project area compared to the No-Build Alternative, with the exception of dissolved copper at the Columbia Slough which may experience a slight increase (0.01 to 0.02 lbs per year)	<p>*Project will incorporate stormwater management and treatment measures prior to stormwater being infiltrated or released to surface water.</p> <p>*Project will complete all necessary stormwater-related permits.</p> <p>*Some or all of the water quality BMPs from ODOT's stormwater quality memo or more stringent applicable standards will be included in the CRC project.</p> <p>*Re-vegetation of construction easements and other areas after the project is complete will be performed.</p>	Section 401 (Clean Water Act). NPDES. Local stormwater management guidelines.
<b>Hydrology</b>		
Encroachment in floodplains	*Flood-rise impact to the Columbia River is expected to be negligible, based on preliminary design. A flood-rise analysis will be conducted during the final design to verify the impact of the piers in the water. If necessary, mitigation will be identified to negate flood rise impacts.	Executive Order 11988
<b>Temporary Effects</b>		
<b>Temporary in-water impacts</b>		
Construction of bridge piers could increase turbidity.	*The project will use cofferdams for shallow pier construction to decrease turbidity.	Section 404 and Section 401 (Clean Water Act)
Construction of bridge piers could disturb existing pollutants.	*The project has conducted sediment sampling in the Columbia River and North Portland Harbor. The results came back clean. Dredged sediment has been approved for in-water disposal by the U.S. Army Corps of Engineers.	
Construction of bridge piers could introduce new pollutants to waterways.	*To prevent new contaminants from entering waterways, the project will employ such measures for full containment of hazardous materials during construction and for collecting and containing water coming into contact with untreated concrete.	
<b>Temporary upland, below-grade construction</b>		
Dewatering can increase the likelihood of existing contaminants migrating through the groundwater and potentially into surface waters.	*Sites with existing soil or groundwater contamination near construction areas have been identified and will be further studied and tested before any groundwater pumping occurs, in order to avoid causing such contamination to spread. Monitoring of this possible ground water contamination will continue throughout the project dewatering process.	CERCLA. Section 401 (Clean Water Act). OAR 340. WAC 173
<b>Temporary ground disturbance</b>		
Due to the generally flat topography, construction of SA is not likely to cause substantial amounts of erosion. However, construction activities can increase soil	The project will comply with all requirements and permits required under National Pollutant Discharge Elimination System (NPDES) and other related permit required.	NPDES. City of Portland Codes (CPC) Title 10 and Vancouver Municipal

Impact from the SA	Mitigation or Compensation	Regulatory Driver
<p>erosion; if runoff contains extra sediment from erosion, waterways can become turbid and can build up excessive sediment deposits. Main risk is at the I-5/SR 500 interchange near Burnt Bridge Creek.</p>	<p>*Construction Stormwater Discharge Permits will regulate the discharge of stormwater from construction sites. These permits include discharge water quality standards, runoff monitoring requirements, and provision for preparing a Stormwater Pollution Prevention Plan (SWPPP).</p> <p>*The SWPPP will contain all the elements of a Temporary Erosion and Sediment Control Plan (TESCP) and Spill Prevention Control and Countermeasures Plan (SPCCP).</p> <p>*The contractor will meet the requirements of and follow the process described in ODOT Standard Specifications Section 00280.30 and/or WSDOT Standard Specification 8-01.3(1)B.</p> <p>*The erosion and spill control (ESC) lead will be listed on the Emergency Contact List as part of ODOT Standard Specifications Section 00290.20(g) and/or WSDOT Standard Specification 1-05.13(1). The ESC lead will also be responsible for ensuring compliance with all local, state, and federal erosion and sediment control requirements.</p> <p>*All TESCP measures will be inspected as prescribed. Contractor will follow maintenance and repair as described in ODOT Standard Specifications Section 00280.60 to 00280.70 and/or WSDOT Standard Specification 8-01.3(15).</p>	<p>Codes (VMC) Chapter 14.24</p>
<p><b>Temporary off-site staging and casting</b></p>		
<p>May increase stormwater runoff and may increase pollutant levels in the runoff</p>	<p><i>See mitigation measures above: NPDES, SWPPP, TESCP, SPCCP</i></p>	<p>See regulatory drivers above</p>
<p><b>3.15 Wetland and Jurisdictional Waters</b></p>		
<p>Direct impact to wetland buffers and environmental zones at Victory Interchange, Kiggins Bowl, and Burnt Bridge Creek</p>	<p>*In Oregon, if the CRC project is not exempt from environmental zone regulations (33.430.080) and the project does not meet the City of Portland's development standards (33.430.140 through .190), environmental review and mitigation will be required by the City. The mitigation site plan must demonstrate that the mitigation will replace all of the resources and functions affected, will be within the same watershed as the affected environmental zone (unless another location better achieves the mitigation objectives), and that a suitable mitigation site is owned by the applicant.</p> <p>*In the project area in Washington, wetland buffers are regulated by the City of Vancouver under its critical areas protection ordinance. Compensatory mitigation is required to address affected functions by achieving a functional equivalency or improvement and providing a similar wetland or buffer function. Approval criteria require no net loss of functions or values for any activity impacting a critical area.</p>	<p>Clean Water Act, City of Portland environmental zone regulations, City of Vancouver critical areas protection ordinance</p>



Impact from the SA	Mitigation or Compensation	Regulatory Driver
Possibility of impact to potential Vancouver Way Wetland	ODOT and FHWA will secure right-of-entry to the property containing the potential Vancouver Way Wetland in order to confirm the presence or absence of a wetland at this location. If presence is confirmed, then the project will comply with the relevant regulatory and permitting requirements, including avoiding, minimizing, and mitigating wetland impacts.	Clean Water Act, City of Portland environmental zone regulations, Oregon Removal/Fill law
New permanent bridge piers in the Columbia River and North Portland Harbor would cover an area of 1.40 acres and displace a volume of 47,400 cubic yards. Demolition of the existing bridges in the main stem of the Columbia River would result in removal activity in approximately 0.64 acre of waterway and 44,300 cubic yards of material, for a net 0.76 acre of river impacted and 3,100 cubic yards water displaced by the SA. In addition, the project may impact roadside ditches that may be considered jurisdictional.	<p>*Include mitigation and conservation plans and actions to identify and implement habitat protection, restoration, and enhancement as appropriate. These actions are intended not only to compensate for unavoidable impacts of bridge construction and demolition to species, habitats, and resource sites, but to achieve a “net conservation benefit.”</p> <p>*A net conservation benefit could be achieved with participation in the following projects. (If CRC is unable to participate in these projects, comparable third-party mitigation will be identified to comply with the Clean Water Act, Washington Hydraulic Approval, Oregon Removal/Fill and Washington Shoreline Management Act compliance.)</p> <p>*In Oregon, the Hood River Off-Channel Reconnection Project is planned as compensatory mitigation for temporary and permanent impacts to the Columbia River.</p> <p>*In Washington, the Lewis River Confluence Side Channel Restoration Project is planned.</p> <p>*Mitigation for impacts to jurisdictional ditches, if any occur, will likely involve reconstruction of the ditches and re-vegetation with native plants.</p>	Clean Water Act, Oregon Removal/Fill law, Washington Hydraulic Project Approval, Washington Shoreline Management Act
As with the existing bridge piers, replacement bridge piers in the Columbia River for the SA may result in long-term impacts to aquatic species, including protected fish species.		
<b>Temporary Effects</b>		
Temporary impacts to wetlands buffers and waterways are more likely to occur at locations where long-term impacts are anticipated. Temporary impacts may include impacts to roadside ditches that may be considered jurisdictional.	<p>*Mitigation measures include replacement of vegetation that is cleared for construction activities in accordance with local regulatory guidance.</p> <p>*Temporary disturbances to wildlife activity, hydrology, and water quality will be avoided as much as possible through the use of best management practices such as silt fences, construction fencing, and wildlife exclusionary netting during the construction process.</p> <p>*Mitigation for these impacts will likely involve reconstruction of the ditches and re-vegetation with native plants.</p>	City of Portland Environmental Zone regulations. City of Vancouver Critical Areas Ordinance
The staging and casting/assembly sites may contain wetlands, and activities may increase stormwater runoff over existing conditions and may increase pollutant loading.	The development and use of any staging and casting sites will meet all applicable stormwater requirements during and following utilization of the sites. All necessary permits will be secured prior to site development and operations, and the project will be required to avoid, minimize and mitigate wetland impacts, if any would occur.	Federal, state, and local regulations

Impact from the SA	Mitigation or Compensation	Regulatory Driver
<b>3.16 Ecosystems</b>		
<p>Larger piers would continue to provide cover for predatory fish and displacement of shallow water habitat (although the project would provide a net gain in shallow water habitat).</p>	<p>Mitigation measures will include discouraging predator use of piers and promoting aquatic habitat conservation efforts through the following:</p> <ul style="list-style-type: none"> <li>*A Hydraulic Project Approval (HPA) issued by WDFW, a Removal-Fill Permit issued by DSL, and a Section 404 permit issued by USACE under the Clean Water Act will likely require mitigation actions for construction activities that will affect fish and shellfish habitat of state waters.</li> <li>*Long-term impacts to terrestrial and riparian resources will be addressed through avoidance and minimization measures and replanting vegetation.</li> </ul>	<p>City of Portland Environmental Zone regulations. City of Vancouver Critical Areas Ordinance. Section 401 and 404 of the Clean Water Act. Washington Hydraulic Project Approval. Endangered Species Act.</p>
<p>Existing bridge habitat for Peregrine falcons would be removed (although no long-term adverse effects on the overall viability of the species in anticipated).</p>		
<p>The project will be constructed in areas that have protected habitat (Washington Priority Habitat, Vancouver Critical Areas, Metro Title 13, and City of Portland E-zones); however, the additional acreage should not adversely affect the overall function of terrestrial and riparian habitat or the long-term sustainability of plant and animal species in the project area. The project will be mostly constructed over existing roadways or within existing rights-of-way.</p>		
<b>Temporary Effects</b>		
<ul style="list-style-type: none"> <li>*In-water construction of bridge piers could stir up sediments from the riverbed, which would increase turbidity and adversely affect fish.</li> <li>*Cofferdams installed to isolate work areas around bridge piers would temporarily displace aquatic habitat.</li> <li>*Underwater noise from impact pile driving and heavy machinery could injure or kill nearby fish.</li> <li>*Underwater and in-air noise impacts to sea lions may include disturbance and behavioral effects.</li> <li>*Temporary in-water construction platforms and work barges could shade a total of 108,000 square feet of the river, providing potential cover for fish species that prey on salmon.</li> <li>*Construction-related contaminants could enter the water during this work.</li> <li>*Disturbance from construction activities could kill fish, delay migration, or lower reproductive success.</li> <li>*Benthic organisms could be displaced from the river bed during in-water construction work, but are likely to return rapidly once that work is over.</li> </ul>	<ul style="list-style-type: none"> <li>*NPDES Construction Stormwater Discharge Permits will regulate the discharge of stormwater from construction sites. These permits include discharge water quality standards, runoff monitoring requirements, and provision for preparing a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP will contain all the elements of a Temporary Erosion and Sediment Control Plan (TESCP) and Spill Prevention Control and Countermeasures Plan (SPCCP).</li> <li>*Turbidity caused by any activity inside the cofferdams will be contained within the cofferdams.</li> <li>*Immediately after isolation and dewatering of the in-water work area, isolated fish will be captured and released. Contractor will provide a qualified fishery biologist to conduct and supervise fish capture and release activity to minimize risk of injury to fish, in accordance with ODOT SP 00290.31 (i) or its equivalent and/or the 2006 WSDOT Fish Exclusion Protocols and Standards or its equivalent.</li> <li>*The contractor will prepare a Water Quality Sampling Plan for conducting water quality monitoring for all in-water project activities.</li> <li>*All pumps will employ a fish screen that meets the specifications included in the NMFS fish screen criteria.</li> <li>*To avoid and minimize noise impacts from in-water work, the following measures will be employed during construction:</li> </ul>	<p>NPDES. City of Portland Environmental Zone regulations. City of Vancouver Critical Areas Ordinance. Section 401 and 404 of the Clean Water Act. Washington Hydraulic Project Approval. Migratory Bird Treaty Act. Federal, state, and local regulations</p>

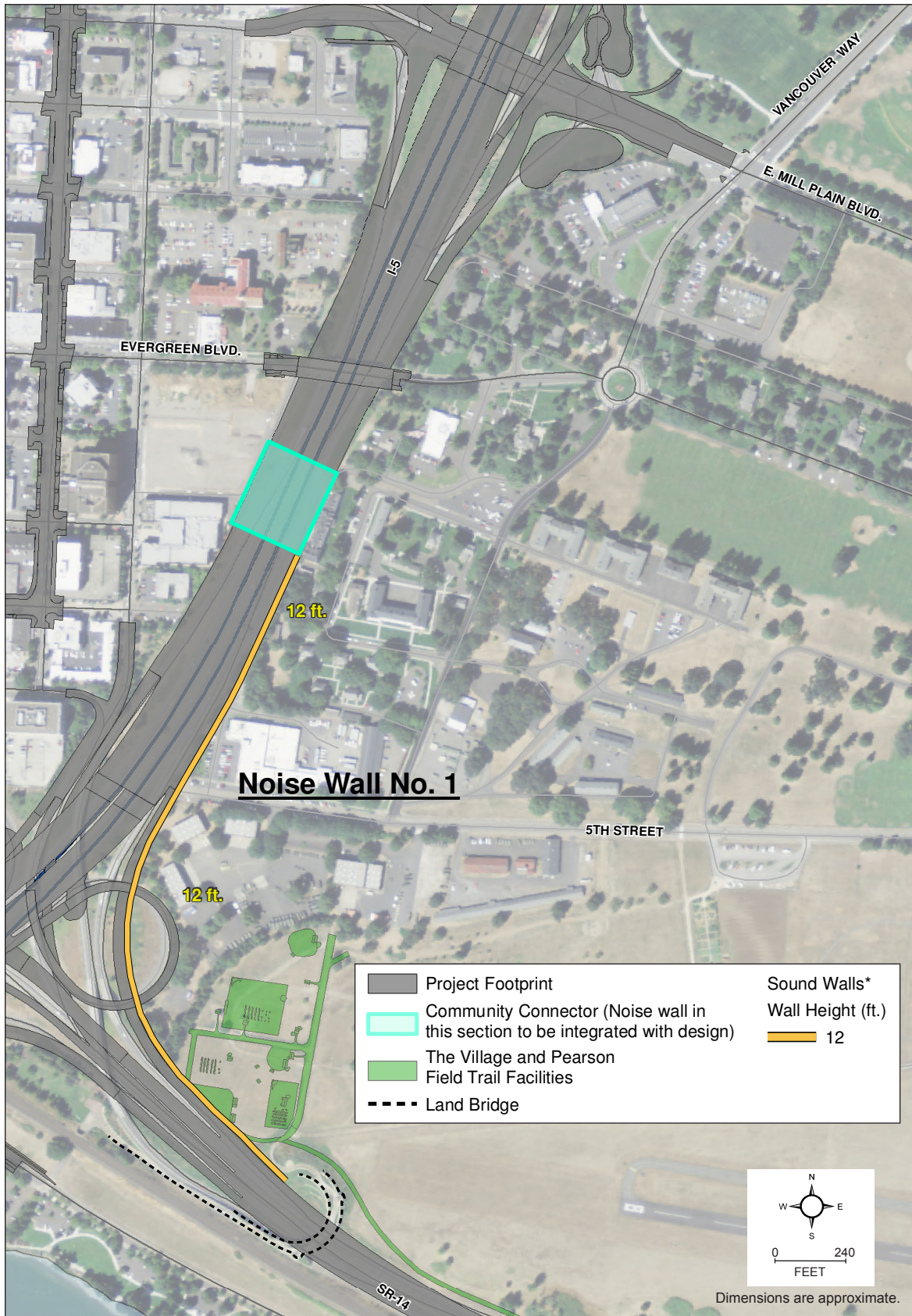
Impact from the SA	Mitigation or Compensation	Regulatory Driver
<p>*Riparian vegetation, including herbaceous plants, shrubs, and small trees that are present, may be trampled or removed during project construction.</p> <p>*The existing bridge provides habitat for some migratory birds, including peregrine falcons; this habitat would be removed or disturbed during construction of the SA or the other build alternatives.</p>	<p>*Use drilled shafts to support the permanent in-water piers.</p> <p>*In waters with depths of more than 0.67 meter, employ a bubble curtain or other attenuation to reduce noise impacts from pile driving.</p> <p>*Establish maximum acceptable sound levels for impact pile driving and monitor for compliance.</p> <p>*Establish the impact pile installation hydroacoustic performance measure.</p> <p>*Time noise-producing activities to minimize impacts to fish.</p> <p>*Install temporary piles by means other than impact driving when engineering limits allow.</p> <p>*Establish measures to reduce impacts from temporary pile removal; for example, remove temporary piles with a vibratory hammer rather than intentionally breaking by twisting or bending.</p> <p>*Marine mammal reporting</p>	
<p>*Construction noise, lights, and vegetation removal could negatively affect terrestrial species and birds, including negatively affecting wildlife passage.</p> <p>*Vegetation removal is likely along the existing roadway, especially near interchanges where alterations are planned.</p>	<p>*Best management practices such as erosion control to protect sensitive riparian and terrestrial habitat and replanting of vegetation</p> <p>*Re-vegetate and remove noxious weeds, as determined through the formal permitting process.</p> <p>*Time construction activities to minimize impacts to migratory birds. Use exclusionary measures or other methods of preventing active nesting, as needed.</p>	
<p>Because the off-site staging and casting site selected would be adjacent to the water, it would have the potential to impact the same species as would bridge construction, as well as other species that may be unique to the particular sites</p>	<p>*The development and operations of the assembly/casting yard will be subject to the same federal and state environmental regulations that apply to other aspects of project construction, as well as any other federal, state, or local regulations that may apply to the particular site. All necessary permits will be secured prior to site development and operations.</p>	<p>Federal, state, and local regulations</p>
<p>In-water construction impacts such as hydroacoustic noise, turbidity, contaminant spills and cofferdams can injure or kill ESA-listed species.</p>	<p>*NMFS coordination will be regular and shall include an annual report coordination meeting (by June 15th annually) to discuss the report, and discuss conservation measure effectiveness and any necessary corrective actions. Other meetings will include FHWA and FTA and their contractors (construction and design) to review the following design plans (30% completion) and reports when available:</p> <ul style="list-style-type: none"> <li>*Stormwater management plan</li> <li>*Spill prevention/pollution control and erosion control plans</li> <li>*Pile-driving and underwater sound management plan</li> <li>*In-water work area isolation plans for all in-water work areas</li> </ul>	<p>NMFS Biological Opinion under Section 7 of ESA</p>

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	<ul style="list-style-type: none"> <li>*Salvage notice</li> <li>*Submit a comprehensive annual program report to NMFS by June 1st each year, beginning following the test pile program and continuing until all site restoration is complete.</li> </ul>	
<p>In-water construction impacts such as hydroacoustic noise, turbidity, and contaminant spills can harass or harm marine mammals or pinnipeds.</p>	<p>*To avoid and minimize noise impacts to marine mammals from in-water work, the following measures will be employed during construction:</p> <ul style="list-style-type: none"> <li>*Establishment of monitoring zones</li> <li>*Visual marine mammal monitoring</li> <li>*Ramp-up and shut-down procedures</li> <li>*Hydroacoustic monitoring</li> </ul>	<p>NMFS Letter of Authorization under MMPA</p>
<b>3.17 Geology and Soils</b>		
<b>Steep slopes, soils and landslide</b>		
<p>The steep slopes found within the Burnt Bridge Creek area have landslide potential and could be adversely impacted by the SA</p>	<ul style="list-style-type: none"> <li>*Minimize the extent of construction activities on steep slopes identified in Burnt Bridge Creek drainage area in order to reduce landslide potential.</li> <li>*Where steep slopes are adversely impacted, the SA will include retaining walls or other stabilization techniques, reducing soil erosion and lowering the potential for slope failure.</li> <li>*Further assess existing geologic hazards such as, but not limited to, faults, ancestral landslides, steep cut slopes, and soil liquefaction during the final engineering stage of the project. Site-specific assessments will include additional geotechnical testing and monitoring.</li> </ul>	<p>Federal, state, and local building codes or standards</p>
<b>Geologic resources</b>		
<p>The SA will use top soil, fill, aggregate, quarry rock, concrete, and asphalt resources. Some will consist of new mined or quarried materials.</p>	<p>*To the extent practicable, recycle or reuse aggregate, quarry rock, asphalt, and concrete materials generated by project-related demolition and construction activities.</p>	<p>NEPA</p>
<b>Groundwater resources</b>		
<p>Subsurface structures may change localized groundwater movement.</p>	<ul style="list-style-type: none"> <li>*To the extent practicable, locate stormwater treatment facilities away from City of Vancouver well head protection zones for Water Stations 1 and 3. EPA conditions of approval under Federal Sole Source Aquifer Program requires soil and groundwater samples be taken at each site where highway piles and shafts will be placed. Focused Environmental Assessment Work Plan will be implemented to ensure construction activities do not exacerbate contamination or affect groundwater quality.</li> <li>*Conduct Focused Environmental Site Assessments (FEAs) in areas not covered by Phase 1 or 2 Environmental Site Assessments (ESA). During project construction the FEA work plan will address the potential to encounter hazardous materials at specific sites, impacts of construction on hazardous</li> </ul>	<p>NPDES. Safe Drinking Water Act. City of Vancouver VMC Chapter 14.25 and 14.26, Water and Sewers</p>

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	<p>materials and handling any hazardous materials discoveries. State DOT hazardous material departments within each respective state (Oregon and Washington) will review and approve the Focused Environmental Assessment's (FEAs). As part of the FEA work plan, the DOT hazardous materials departments will coordinate with ODEQ, WDOE and/or EPA on any hazardous materials discoveries and implement the response plan.</p> <p>*Design post project construction completion stormwater infiltration facilities to provide the necessary separation between the bottom of the basin and seasonal high of the groundwater table to minimize any potential of groundwater contamination.</p>	
<b>Indirect Effects</b>		
<p>The SA may facilitate and accelerate development, particularly near the SA's light rail stations, possibly causing increased development in earthquake hazard areas and a potential improvement to groundwater quality through improved stormwater management. The greatest risk from earthquakes in the project area occurs along the banks of the Columbia River and North Portland Harbor.</p>	<p>*No project mitigation needed.</p>	<p>NPDES. Federal, state, and local building codes or standards</p>
<b>Temporary Effects</b>		
<p>The SA will conduct excavation, fill, drilling and grading during construction. Without mitigation, this would result in temporary soil erosion, sedimentation, and impacts to stormwater, surface water, and groundwater quality within the main project area.</p>	<p>*Implement erosion control and stormwater pollution prevention plans during construction.</p>	<p>NPDES. City of Portland Codes (CPC) Title 10 and Vancouver Municipal Codes (VMC) Chapter 14.24</p>
<p>Temporary effects from contaminated soils, sediments, and groundwater may occur, including the potential sites for staging and casting.</p>	<p>*See Hazardous Materials, below, for discussion of mitigation for potential temporary effects related to contaminated soils, sediments, and groundwater.</p>	
<b>3.18 Hazardous Materials</b>		
<p>Acquisition of property may result in an increased liability for existing hazardous materials in the project area.</p>	<p>Perform due diligence before acquiring property, including property transaction screening and Phase I and Phase II Environmental Site Assessments, as appropriate.</p>	<p>CERCLA</p>
<b>Stormwater conveyance system and treatment facilities</b>		
<p>Groundwater and surface water quality can be diminished by petroleum, salts, and other materials contained in stormwater runoff from roadways and bridges. Compared to the No-Build alternative the SA would have beneficial effects to the environment in regards to stormwater quality.</p>	<p>*Stormwater will be managed and treated prior to being infiltrated or released to surface water as required under NPDES and other stormwater management permits.</p> <p>*Prepare a stormwater management and facilities maintenance plan as required under NPDES and other stormwater management permits</p>	<p>NPDES. Local stormwater management guidelines. CWA</p>

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	*Implement stormwater management plans approved by local, state and federal regulatory agencies and constructing facilities as shown in the attached maps (Figures B-1 to B-3).	
Two legacy hazardous materials sites, the Boise Cascade cleanup site and the Harbor Oil Superfund Site, are located within the main project area. Regulatory agencies may require these sites, or newly identified sites, to conduct long-term cleanup actions, and these actions may affect project operations and maintenance. In special cases, cleanup of hazardous materials sites, independent of the CRC project, could require ongoing access across the highway or transit way, for example, for trucks carrying loads of contaminated soil from the site to an off-site disposal area. Such activities have the potential to have long-term impacts on any of the CRC build alternatives.	The following measures, to be developed during final design: *Construction health and safety plans *Spill control and prevention plans *Contaminated media management plans *Conduct lead and asbestos surveys in accordance with CERCLA.	NEPA CERCLA, NPDES
The SA includes the expansion of light rail maintenance infrastructure at the TriMet Ruby Junction Maintenance Facility in Gresham, Oregon. This expansion would include 15 property acquisitions. State regulatory information sources indicate that one of these properties is listed in environmental databases. Potential effects may include clean-up and liability issues related to property acquisitions.	Perform due diligence before acquiring property, including property transaction screening and Phase I and Phase II Environmental Site Assessments, as appropriate to reduce risk associated with existing hazardous materials sites.	CERCLA
<b>Temporary Effects</b>		
Potential for accidental exacerbation of existing hazardous materials sites during construction	*Construction stormwater pollution prevention plans *NPDES construction general stormwater permits *Stormwater conveyance system and treatment facilities monitoring plan *Construction health and safety plans *Spill control and prevention plans *Contaminated media management plan *Lead and asbestos surveys *Well decommissioning: Identified wells within the project footprint that are no longer needed, if any, will be decommissioned prior to or during construction, consistent with OAR 690-220. *Conduct Focused Site Assessments (e.g., Phase I ESA, Phase II ESA, property transaction screen) in accordance with CERCLA.	NPDES. CERCLA. TOSCA. CWA. OAR 340. WAC 173. Safe Drinking Water Act. City of Portland Codes (CPC) Title 10 and Vancouver Municipal Codes (VMC) Chapter 14.24. OAR 690-220, Abandonment of Water Supply Wells and City of Portland Title 21.35, Well Head Protection
Potential for accidental release or generation of hazardous materials during construction	*Construction health and safety plans *Spill control and prevention plans *Contaminated media management plans *Conduct lead and asbestos surveys in accordance with CERCLA.	NPDES. RCRA. TOSCA. OAR 340. WAC 173

<b>Impact from the SA</b>	<b>Mitigation or Compensation</b>	<b>Regulatory Driver</b>
<p>Casting and Staging Sites: potential for increased liability for existing hazardous materials in the project area or accidental exacerbation of existing hazmat sites</p>	<p>Perform due diligence before acquiring property, conduct Phase I and, if necessary, Phase II Environmental Site Assessments in accordance with CERCLA.</p> <p>*See Mitigation measures for Potential for Accidental Exacerbation of Existing Hazardous Materials Sites During Construction.</p>	<p>CERCLA</p>

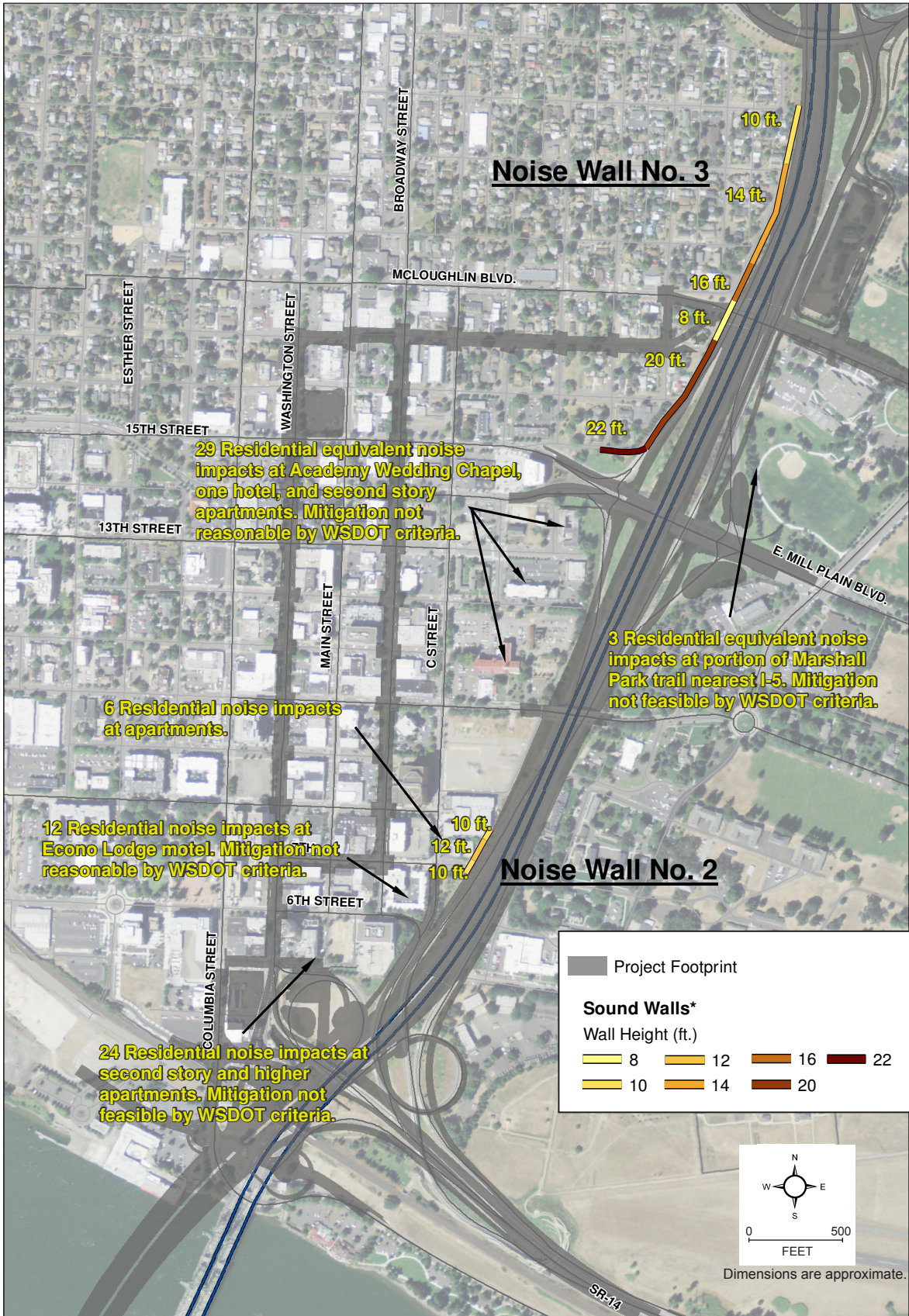


Note: Noise wall heights and locations are subject to change based on final project design.  
 \*Sound wall symbols are not to scale.

**Figure A-1. Traffic Noise Impacts After Mitigation – VNHR**

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Note: Noise wall heights and locations are subject to change based on final project design.

\*Sound wall symbols are not to scale

**Figure A-2. Traffic Noise Impacts After Mitigation – Downtown Vancouver**

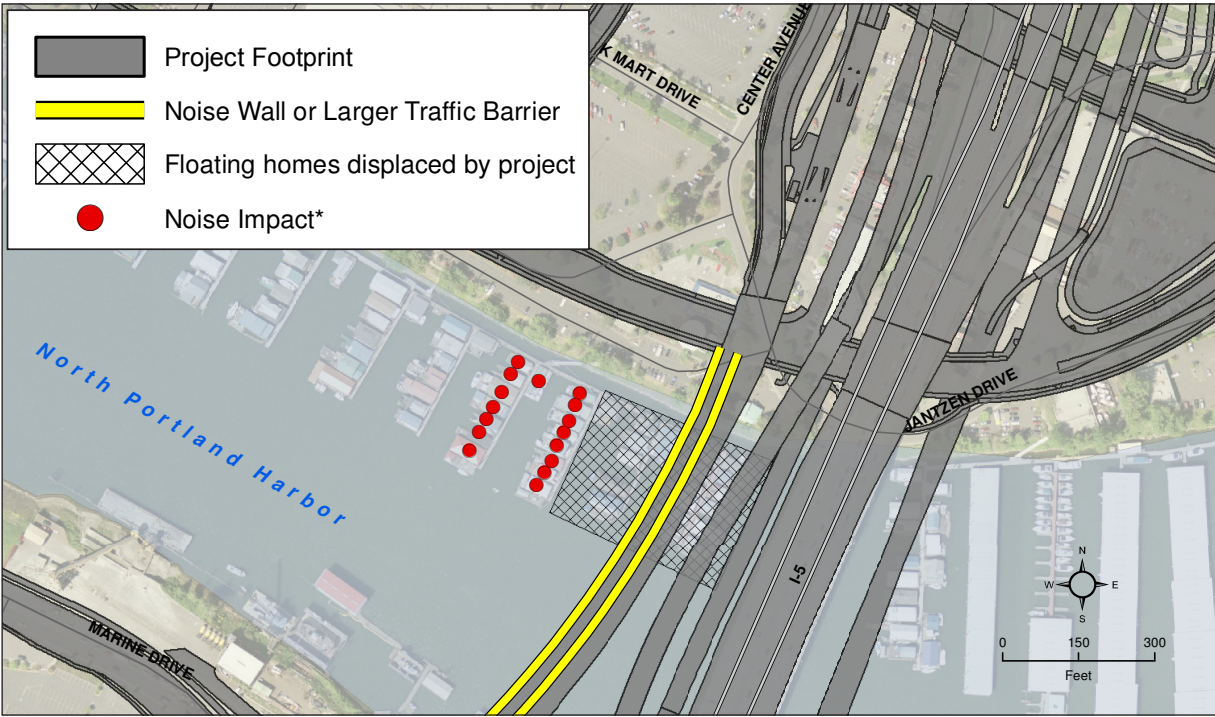
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Note: Noise wall heights and locations are subject to change based on final project design.  
 \*Sound wall symbols are not to scale

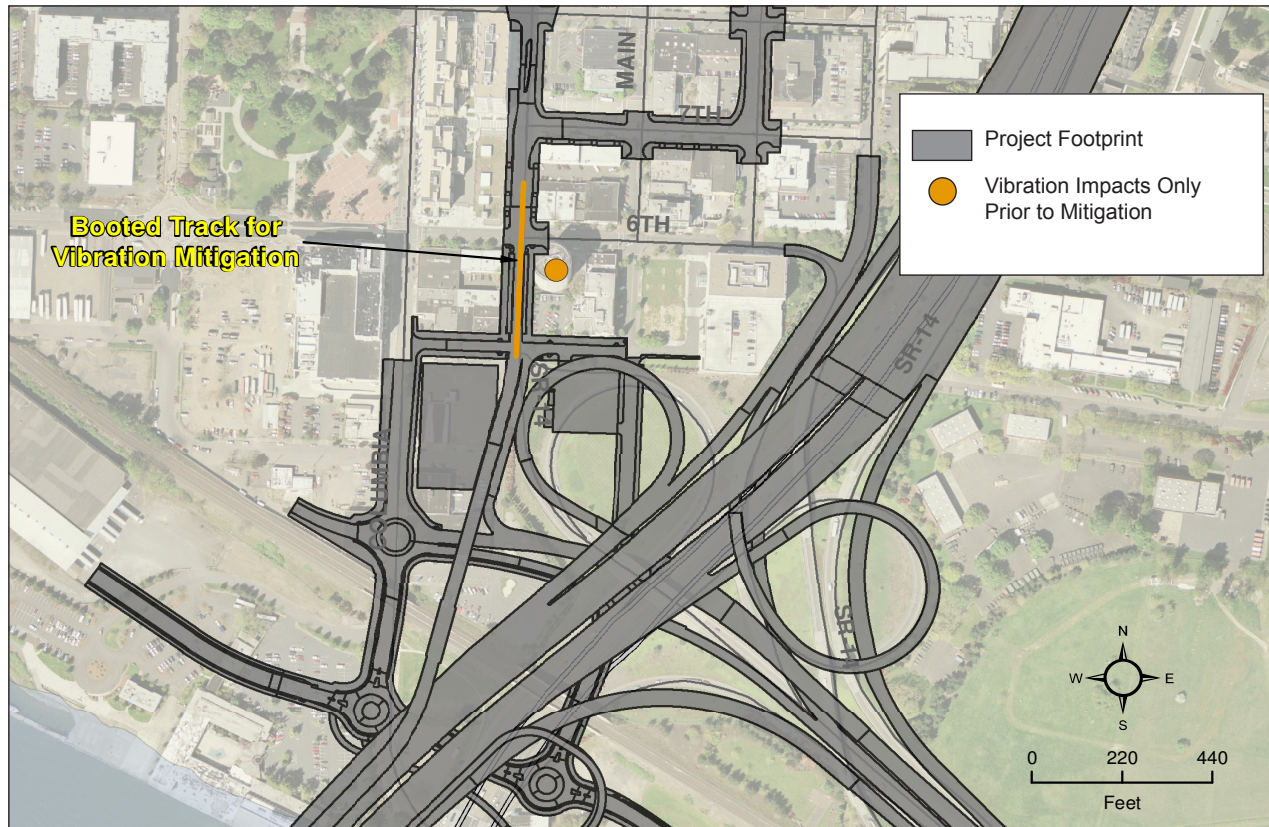
**Figure A-3. Traffic Noise Impacts After Mitigation – North Vancouver**

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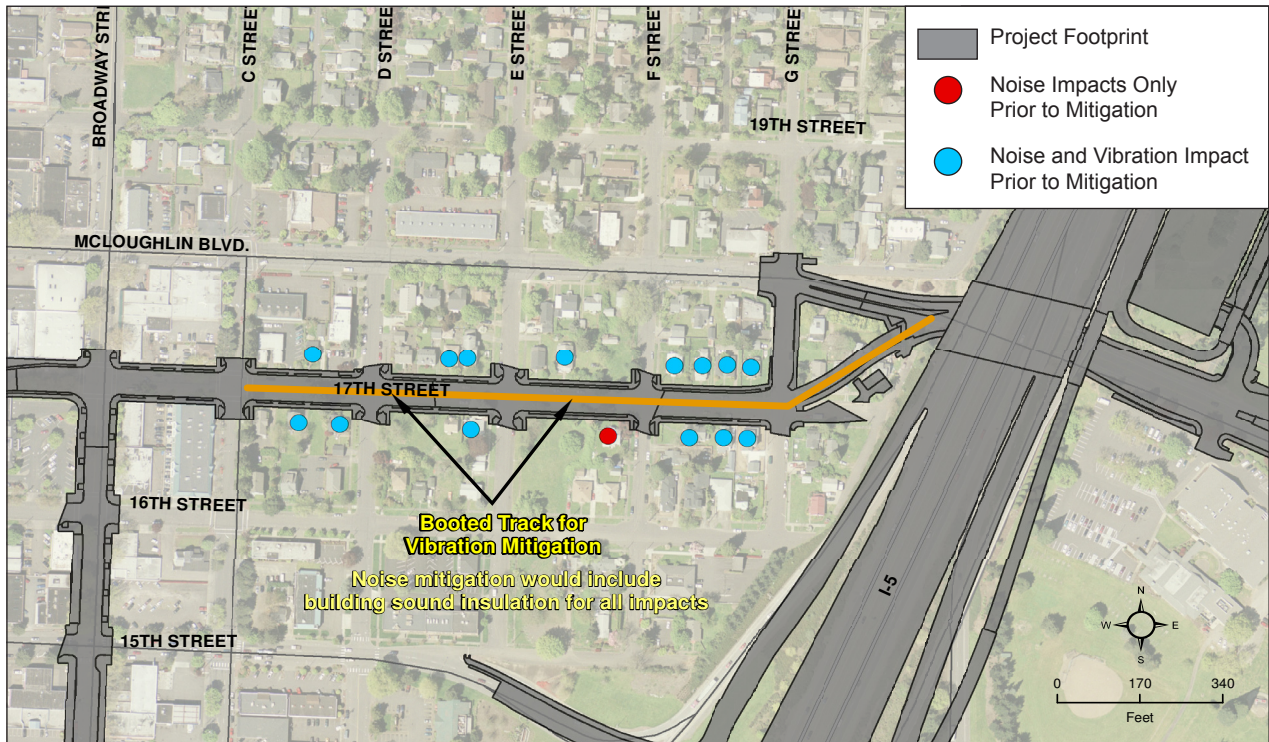


**Figure A-4. Light Rail Noise Impact to Floating Homes in Portland**

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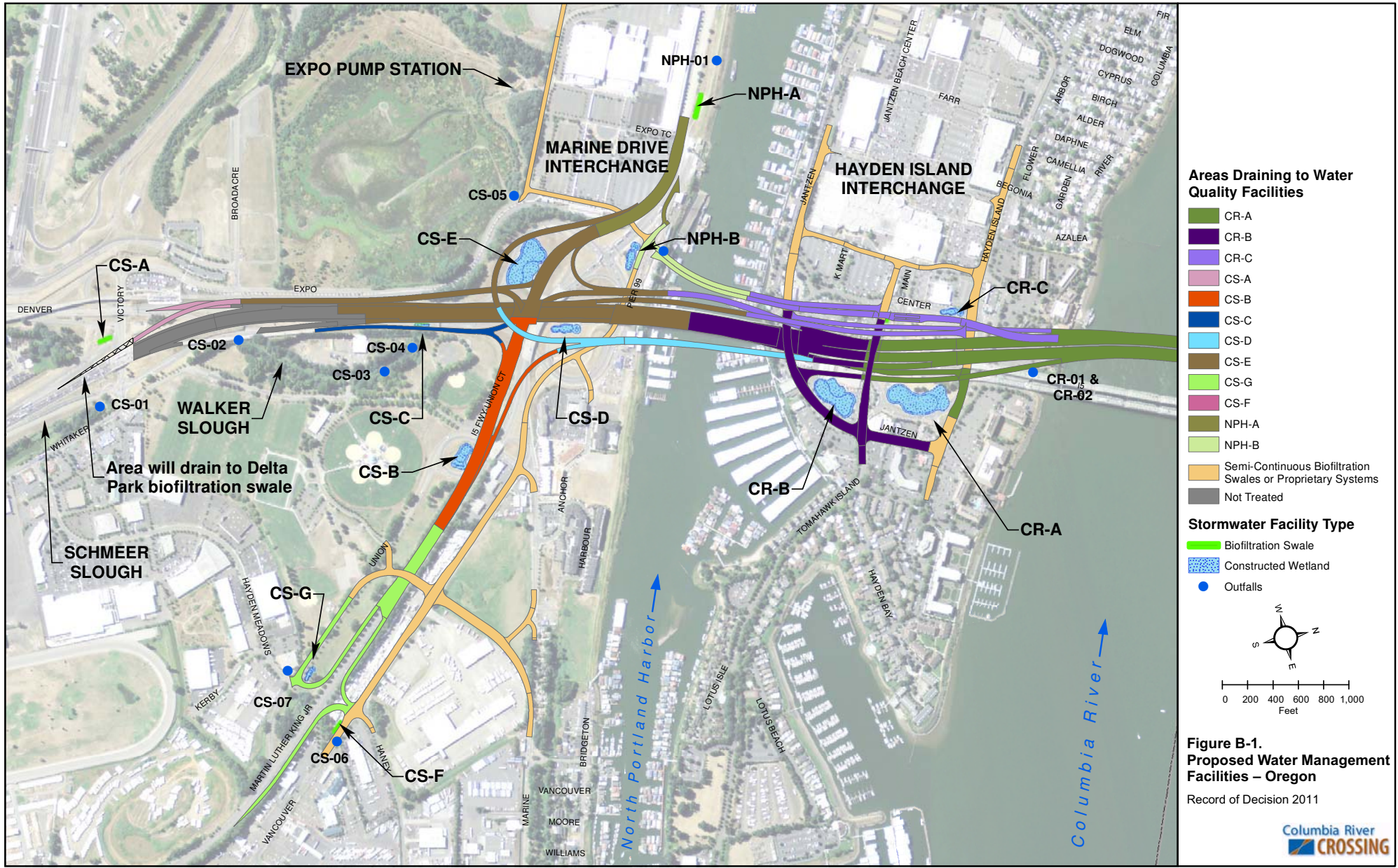
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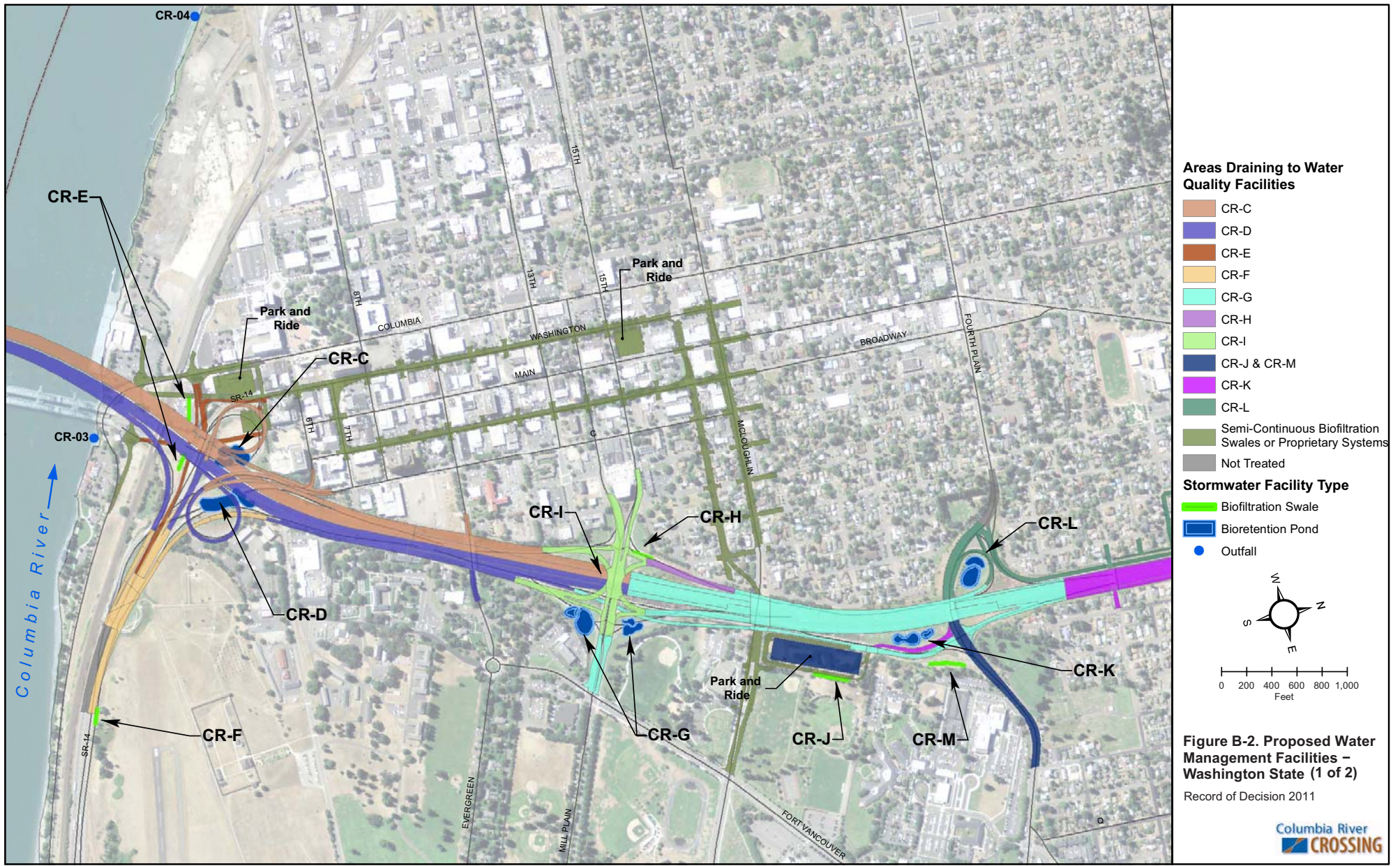


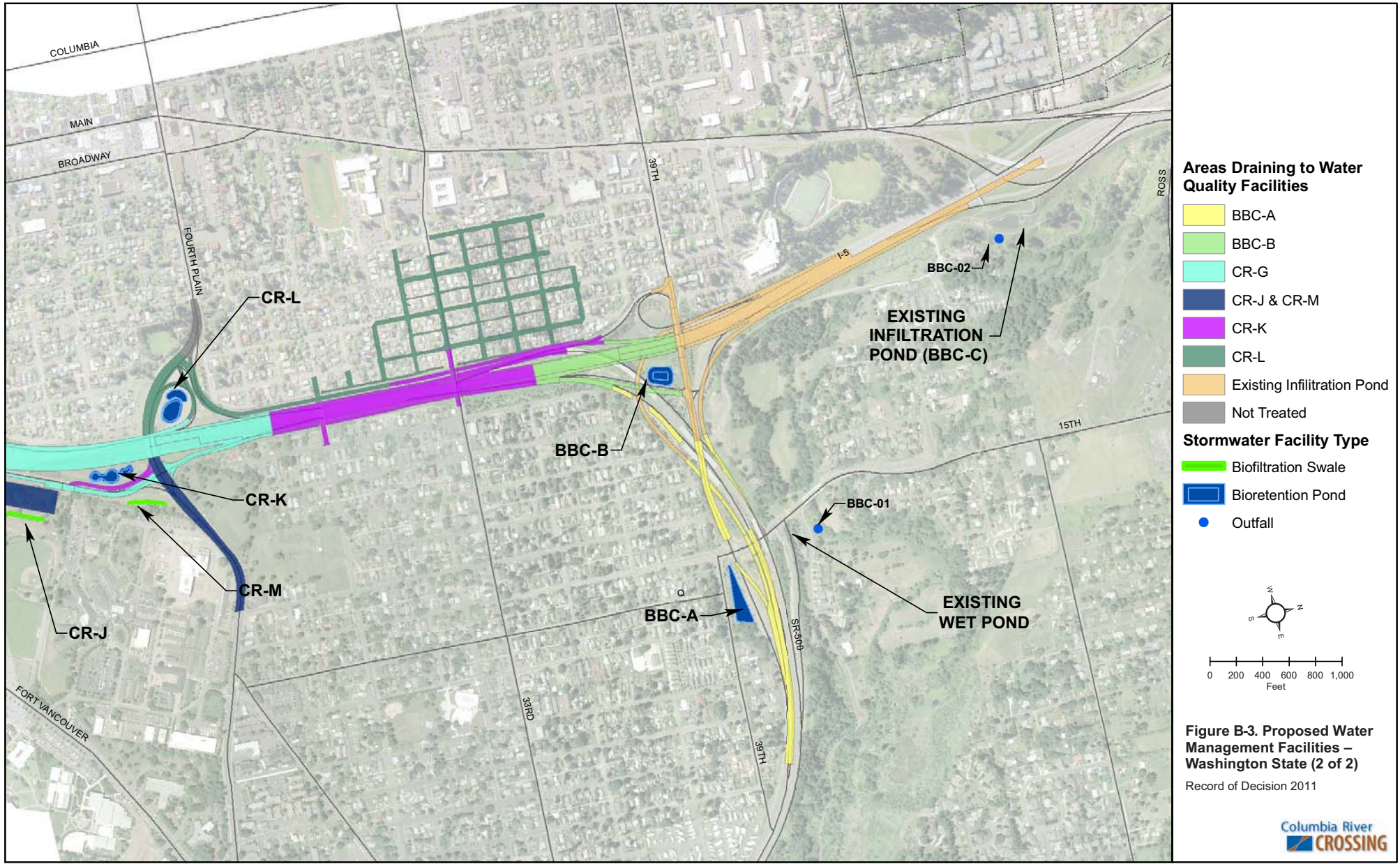
Dimensions are approximate.

**Figure A-5. Light Rail Noise and Vibration Impacts to Smith Tower and E 17th in Vancouver**

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Analysis by J. Koloszar; Analysis Date: Dec. 21, 2010; File Name: Ex3\_13-11Stormwater\_RK251.mxd