

INTERSTATE 5 COLUMBIA RIVER CROSSING

Historic Built Environment Technical Report for the Final
Environmental Impact Statement



May 2011

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Cover Sheet

Interstate 5 Columbia River Crossing

Historic Built Environment Technical Report for the Final Environmental Impact Statement:

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ACRONYMS

Acronym	Description
ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
APE	area of potential effect
API	area of potential impact
BNRR	Burlington Northern Railroad
BNSF	Burlington Northern Santa Fe Railroad
BPA	Bonneville Power Administration
C-TRAN	Clark County Public Transportation Benefit Area
CCHR	Clark County Historical Register
CD	collector-distributor
CFR	Code of Federal Regulations
CRC	Columbia River Crossing
CSDDHD	Columbia Slough Drainage Districts Historic District
CTR	Commute Trip Reduction (Washington)
CWG	Cultural Resources Work Group
DAHP	Washington Department of Archaeology and Historic Preservation
DEIS	Draft Environmental Impact Statement
dB	decibel
dba	A-weighted decibel
DOE	Determination of Eligibility
DOT	U.S. Department of Transportation
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
FOE	Finding(s) of Effect
FTA	Federal Transit Administration
HABS/HAER	Historic American Building Survey/Historic American Engineering Record
HBC	Hudson Bay Company
HCT	high-capacity transit
I-5	Interstate 5
l.f.	linear feet
L _{dn}	24-hour, Time Weighted, A-weighted Sound Level
LPA	Locally Preferred Alternative

LRV	light rail vehicle
MAX	Metropolitan Area Express
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NHS	National Historic Site
NPS	National Park Service
NRHP	National Register of Historic Places
ODOT	Oregon Department of Transportation
OTC	Oregon Transportation Commission
PI	Pacific International
RCW	Revised Code of Washington
ROD	Record of Decision
RTC	Regional Transportation Council
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SDIC	Sandy Drainage Improvement Company
sq.ft.	square feet
SHPO	Oregon State Historic Preservation Office
SP&S	Spokane, Portland, and Seattle Railroad
SPUI	single-point urban interchange
SR	state route
TDM	transportation demand management
TriMet	Tri-County Metropolitan Transportation District
TSM	transportation system management
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
VA	Veteran's Administration
VMC	Vancouver Municipal Code
VNHR	Vancouver National Historic Reserve
WSDOT	Washington State Department of Transportation
WSHR	Washington State Historical Register
WTC	Washington Transportation Commission

1. Summary

1.1 Introduction

This report presents the identification and evaluation of potential impacts to National Register of Historic Places-listed or -eligible historic resources that would result from the proposed Interstate 5 (I-5) Columbia River Crossing (CRC) project. This report identifies the likely project impacts from those alternatives and identifies potential measures to reduce the impacts, including possible options for avoiding, minimizing or mitigating impacts. This report was initially produced to support the CRC Draft Environmental Impact Statement (DEIS) and help inform a decision about a locally preferred alternative. This report is updated to reflect the decision on the locally preferred alternative (LPA) and to assess further design modifications and new input received from the public input processes.

1.2 Description of Alternatives

This technical report evaluates the CRC project's locally preferred alternative (LPA) and the No-Build Alternative. The LPA includes two design options: The preferred option, LPA Option A, which includes local vehicular access between Marine Drive and Hayden Island on an arterial bridge; and LPA Option B, which does not have arterial lanes on the light rail/multi-use path bridge, but instead provides direct access between Marine Drive and the island with collector-distributor (CD) lanes on the two new bridges that would be built adjacent to I-5. In addition to the design options, if funding availability does not allow the entire LPA to be constructed in one phase, some roadway elements of the project would be deferred to a future date. This technical report identifies several elements that could be deferred, and refers to that possible initial investment as LPA with highway phasing. The LPA with highway phasing option would build most of the LPA in the first phase, but would defer construction of specific elements of the project. The LPA and the No-Build Alternative are described in this section.

1.2.1 Adoption of a Locally Preferred Alternative

Following the publication of the Draft Environmental Impact Statement (DEIS) on May 2, 2008, the project actively solicited public and stakeholder feedback on the DEIS during a 60-day comment period. During this time, the project received over 1,600 public comments.

During and following the public comment period, the elected and appointed boards and councils of the local agencies sponsoring the CRC project held hearings and workshops to gather further public input on and discuss the DEIS alternatives as part of their efforts to determine and adopt a locally preferred alternative. The LPA represents the alternative preferred by the local and regional agencies sponsoring the CRC project. Local agency-elected boards and councils determined their preference based on the results of the evaluation in the DEIS and on the public and agency comments received both before and following its publication.

In the summer of 2008, the local agencies sponsoring the CRC project adopted the following key elements of CRC as the LPA:

- A replacement bridge as the preferred river crossing,
- Light rail as the preferred high-capacity transit mode, and
- Clark College as the preferred northern terminus for the light rail extension.

The preferences for a replacement crossing and for light rail transit were identified by all six local agencies. Only the agencies in Vancouver – the Clark County Public Transit Benefit Area Authority (C-TRAN), the City of Vancouver, and the Regional Transportation Council (RTC) – preferred the Vancouver light rail terminus. The adoption of the LPA by these local agencies does not represent a formal decision by the federal agencies leading this project – the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) – or any federal funding commitment. A formal decision by FHWA and FTA about whether and how this project should be constructed will follow the FEIS in a Record of Decision (ROD).

1.2.2 Description of the LPA

The LPA includes an array of transportation improvements, which are described below. When the LPA differs between Option A and Option B, it is described in the associated section. For a more detailed description of the LPA, including graphics, please see Chapter 2 of the FEIS.

1.2.2.1 Multimodal River Crossing

Columbia River Bridges

The parallel bridges that form the existing I-5 crossing over the Columbia River would be replaced by two new parallel bridges. The eastern structure would accommodate northbound highway traffic on the bridge deck, with a bicycle and pedestrian path underneath; the western structure would carry southbound traffic, with a two-way light rail guideway below. Whereas the existing bridges have only three lanes each with virtually no shoulders, each of the new bridges would be wide enough to accommodate three through-lanes and two add/drop lanes. Lanes and shoulders would be built to full design standards.

The new bridges would be high enough to provide approximately 95 feet of vertical clearance for river traffic beneath, but not so high as to impede the take-offs and landings by aircraft using Pearson Field or Portland International Airport to the east. The new bridge structures over the Columbia River would not include lift spans, and both of the new bridges would each be supported by six piers in the water and two piers on land.

North Portland Harbor Bridges

The existing highway structures over North Portland Harbor would not be replaced; instead, they would be retained to accommodate all mainline I-5 traffic. As discussed at the beginning of this chapter, two design options have emerged for the Hayden Island and Marine Drive interchanges. The preferred option, LPA Option A, includes local vehicular access between Marine Drive and Hayden Island on an arterial bridge. LPA Option B does not have arterial lanes on the light rail/multi-use path bridge, but instead provides direct access between Marine Drive and the island with collector-distributor lanes on the two new bridges that would be built adjacent to I-5.

LPA Option A: Four new, narrower parallel structures would be built across the waterway, three on the west side and one on the east side of the existing North Portland Harbor bridges. Three of the new structures would carry on- and off-ramps to mainline I-5. Two structures west of the existing bridges would carry traffic merging onto or exiting off of I-5 southbound. The new structure on the east side of I-5 would serve as an on-ramp for traffic merging onto I-5 northbound.

The fourth new structure would be built slightly farther west and would include a two-lane arterial bridge for local traffic to and from Hayden Island, light rail transit, and a multi-use path

for pedestrians and bicyclists. All of the new structures would have at least as much vertical clearance over the river as the existing North Portland Harbor bridges.

LPA Option B: This option would build the same number of structures over North Portland Harbor as Option A, although the locations and functions on those bridges would differ, as described below. The existing bridge over North Portland Harbor would be widened and would receive seismic upgrades.

LPA Option B does not have arterial lanes on the light rail/multi-use path bridge. Direct access between Marine Drive and the island would be provided with collector-distributor lanes. The structures adjacent to the highway bridge would carry traffic merging onto or exiting off of mainline I-5 between the Marine Drive and Hayden Island interchanges.

1.2.2.2 Interchange Improvements

The LPA includes improvements to seven interchanges along a 5-mile segment of I-5 between Victory Boulevard in Portland and SR 500 in Vancouver. These improvements include some reconfiguration of adjacent local streets to complement the new interchange designs, as well as new facilities for bicyclists and pedestrians along this corridor.

Victory Boulevard Interchange

The southern extent of the I-5 project improvements would be two ramps associated with the Victory Boulevard interchange in Portland. The Marine Drive to I-5 southbound on-ramp would be braided over the I-5 southbound to the Victory Boulevard/Denver Avenue off-ramp. The other ramp improvement would lengthen the merge distance for northbound traffic entering I-5 from Denver Avenue. The current merging ramp would be extended to become an add/drop (auxiliary) lane which would continue across the river crossing.

Potential phased construction option: The aforementioned southbound ramp improvements to the Victory Boulevard interchange may not be included with the CRC project. Instead, the existing connections between I-5 southbound and Victory Boulevard could be retained. The braided ramp connection could be constructed separately in the future as funding becomes available.

Marine Drive Interchange

All movements within this interchange would be reconfigured to reduce congestion for motorists entering and exiting I-5 at this location. The interchange configuration would be a single-point urban interchange (SPUI) with a flyover ramp serving the east to north movement. With this configuration, three legs of the interchange would converge at a point on Marine Drive, over the I-5 mainline. This configuration would allow the highest volume movements to move freely without being impeded by stop signs or traffic lights.

The Marine Drive eastbound to I-5 northbound flyover ramp would provide motorists with access to I-5 northbound without stopping. Motorists from Marine Drive eastbound would access I-5 southbound without stopping. Motorists traveling on Martin Luther King Jr. Boulevard westbound to I-5 northbound would access I-5 without stopping at the intersection.

The new interchange configuration changes the westbound Marine Drive and westbound Vancouver Way connections to Martin Luther King Jr. Boulevard and to northbound I-5. These two streets would access westbound Martin Luther King Jr. Boulevard farther east. Martin Luther King Jr. Boulevard would have a new direct connection to I-5 northbound.

In the new configuration, the connections from Vancouver Way and Marine Drive would be served, improving the existing connection to Martin Luther King Jr. Boulevard east of the interchange. The improvements to this connection would allow traffic to turn right from Vancouver Way and accelerate onto Martin Luther King Jr. Boulevard. On the south side of Martin Luther King Jr. Boulevard, the existing loop connection would be replaced with a new connection farther east.

A new multi-use path would extend from the Bridgeton neighborhood to the existing Expo Center light rail station and from the station to Hayden Island along the new light rail line over North Portland Harbor.

LPA Option A: Local traffic between Martin Luther King Jr. Boulevard/Marine Drive and Hayden Island would travel via an arterial bridge over North Portland Harbor. There would be some variation in the alignment of local streets in the area of the interchange between Option A and Option B. The most prominent differences are the alignments of Vancouver Way and Union Court.

LPA Option B: With this design option, there would be no arterial traffic lanes on the light rail/multi-use path bridge over North Portland Harbor. Instead, vehicles traveling between Martin Luther King Jr. Boulevard/ Marine Drive and Hayden Island would travel on the collector-distributor bridges that would parallel each side of I-5 over North Portland Harbor. Traffic would not need to merge onto mainline I-5 to travel between the island and Martin Luther King Jr. Boulevard/Marine Drive.

Potential phased construction option: The aforementioned flyover ramp could be deferred and not constructed as part of the CRC project. In this case, rather than providing a direct eastbound Marine Drive to I-5 northbound connection by a flyover ramp, the project improvements to the interchange would instead provide this connection through the signal-controlled SPUI. The flyover ramp could be constructed separately in the future as funding becomes available.

Hayden Island Interchange

All movements for this interchange would be reconfigured. The new configuration would be a split tight diamond interchange. Ramps parallel to the highway would be built, lengthening the ramps and improving merging speeds. Improvements to Jantzen Drive and Hayden Island Drive would include additional through, left-turn, and right-turn lanes. A new local road, Tomahawk Island Drive, would travel east-west through the middle of Hayden Island and under the I-5 interchange, improving connectivity across I-5 on the island. Additionally, a new multi-use path would be provided along the elevated light rail line on the west side of the Hayden Island interchange.

LPA Option A: A proposed arterial bridge with two lanes of traffic, one in each direction, would allow vehicles to travel between Martin Luther King Jr. Boulevard/ Marine Drive and Hayden Island without accessing I-5.

LPA Option B: With this design option there would be no arterial traffic lanes on the light rail/multi-use path bridge over North Portland Harbor. Instead, vehicles traveling between Martin Luther King Jr. Boulevard/Marine Drive and Hayden Island would travel on the collector-distributor bridges that parallel each side of I-5 over North Portland Harbor.

SR 14 Interchange

The function of this interchange would remain largely the same. Direct connections between I-5 and SR 14 would be rebuilt. Access to and from downtown Vancouver would be provided as it is

today, but the connection points would be relocated. Downtown Vancouver I-5 access to and from the south would be at C Street rather than Washington Street, while downtown connections to and from SR 14 would be made by way of Columbia Street at 4th Street.

The multi-use bicycle and pedestrian path in the northbound (eastern) I-5 bridge would exit the structure at the SR 14 interchange, and then loop down to connect into Columbia Way.

Mill Plain Interchange

This interchange would be reconfigured into a SPUI. The existing “diamond” configuration requires two traffic signals to move vehicles through the interchange. The SPUI would use one efficient intersection and allow opposing left turns simultaneously. This would improve the capacity of the interchange by reducing delay for traffic entering or exiting the highway.

This interchange would also receive several improvements for bicyclists and pedestrians. These include bike lanes and sidewalks, clear delineation and signing, short perpendicular crossings at the ramp terminals, and ramp orientations that would make pedestrians highly visible.

Fourth Plain Interchange

The improvements to this interchange would be made to better accommodate freight mobility and access to the new park and ride at Clark College. Northbound I-5 traffic exiting to Fourth Plain would continue to use the off-ramp just north of the SR 14 interchange. The southbound I-5 exit to Fourth Plain would be braided with the SR 500 connection to I-5, which would eliminate the non-standard weave between the SR 500 connection and the off-ramp to Fourth Plain as well as the westbound SR 500 to Fourth Plain Boulevard connection.

Additionally, several improvements would be made to provide better bicycle and pedestrian mobility and accessibility, including bike lanes, neighborhood connections, and access to the park and ride.

SR 500 Interchange

Improvements would be made to the SR 500 interchange to add direct connections to and from I-5. On- and off-ramps would be built to directly connect SR 500 and I-5 to and from the north, connections that are currently made by way of 39th Street. I-5 southbound traffic would connect to SR 500 via a new tunnel underneath I-5. SR 500 eastbound traffic would connect to I-5 northbound on a new on-ramp. The 39th Street connections with I-5 to and from the north would be eliminated. Travelers would instead use the connections at Main Street to connect to and from 39th Street.

Additionally, several improvements would be made to provide better bicycle and pedestrian mobility and accessibility, including sidewalks on both sides of 39th Street, bike lanes, and neighborhood connections.

Potential phased construction option: The northern half of the existing SR 500 interchange would be retained, rather than building new connections between I-5 southbound to SR 500 eastbound and from SR 500 westbound to I-5 northbound. The ramps connecting SR 500 and I-5 to and from the north could be constructed separately in the future as funding becomes available.

1.2.2.3 Transit

The primary transit element of the LPA is a 2.9-mile extension of the current Metropolitan Area Express (MAX) Yellow Line light rail from the Expo Center in North Portland, where it currently

ends, to Clark College in Vancouver. The transit element would not differ between LPA and LPA with highway phasing. To accommodate and complement this major addition to the region's transit system, a variety of additional improvements are also included in the LPA:

- Three park and ride facilities in Vancouver near the new light rail stations.
- Expansion of Tri-County Metropolitan Transportation District's (TriMet's) Ruby Junction light rail maintenance base in Gresham, Oregon.
- Changes to C-TRAN local bus routes.
- Upgrades to the existing light rail crossing over the Willamette River via the Steel Bridge.

Operating Characteristics

Nineteen new light rail vehicles (LRV) would be purchased as part of the CRC project to operate this extension of the MAX Yellow Line. These vehicles would be similar to those currently used by TriMet's MAX system. With the LPA, LRVs in the new guideway and in the existing Yellow Line alignment are planned to operate with 7.5-minute headways during the "peak of the peak" (the two-hour period within the 4-hour morning and afternoon/evening peak periods where demand for transit is the highest) and 15-minute headways during off-peak periods.

Light Rail Alignment and Stations

Oregon Light Rail Alignment and Station

A two-way light rail alignment for northbound and southbound trains would be constructed to extend from the existing Expo Center MAX station over North Portland Harbor to Hayden Island. Immediately north of the Expo Center, the alignment would curve eastward toward I-5, pass beneath Marine Drive, then rise over a flood wall onto a light rail/multi-use path bridge to cross North Portland Harbor. The two-way guideway over Hayden Island would be elevated at approximately the height of the rebuilt mainline of I-5, as would a new station immediately west of I-5. The alignment would extend northward on Hayden Island along the western edge of I-5, until it transitions into the hollow support structure of the new western bridge over the Columbia River.

Downtown Vancouver Light Rail Alignment and Stations

After crossing the Columbia River, the light rail alignment would curve slightly west off of the highway bridge and onto its own smaller structure over the Burlington Northern Santa Fe (BNSF) rail line. The double-track guideway would descend on structure and touch down on Washington Street south of 5th Street, continuing north on Washington Street to 7th Street. The elevation of 5th Street would be raised to allow for an at-grade crossing of the tracks on Washington Street. Between 5th and 7th Streets, the two-way guideway would run down the center of the street. Traffic would not be allowed on Washington between 5th and 6th Streets and would be two-way between 6th and 7th Streets. There would be a station on each side of the street on Washington between 5th and 6th Streets.

At 7th Street, the light rail alignment would form a couplet. The single-track northbound guideway would turn east for two blocks, then turn north onto Broadway Street, while the single-track southbound guideway would continue on Washington Street. Seventh Street will be converted to one-way traffic eastbound between Washington and Broadway with light rail operating on the north side of 7th Street. This couplet would extend north to 17th Street, where the two guideways would join and turn east.

The light rail guideway would run on the east side of Washington Street and the west side of Broadway Street, with one-way traffic southbound on Washington Street and one-way traffic northbound on Broadway Street. On station blocks, the station platform would be on the side of the street at the sidewalk. There would be two stations on the Washington-Broadway couplet, one pair of platforms near Evergreen Boulevard, and one pair near 15th Street.

East-west Light Rail Alignment and Terminus Station

The single-track southbound guideway would run in the center of 17th Street between Washington and Broadway Streets. At Broadway Street, the northbound and southbound alignments of the couplet would become a two-way center-running guideway traveling east-west on 17th Street. The guideway on 17th Street would run until G Street, then connect with McLoughlin Boulevard and cross under I-5. Both alignments would end at a station east of I-5 on the western boundary of Clark College.

Park and Ride Stations

Three park and ride stations would be built in Vancouver along the light rail alignment:

- Within the block surrounded by Columbia, Washington 4th and 5th Streets, with five floors above ground that include space for retail on the first floor and 570 parking stalls.
- Between Broadway and Main Streets next to the stations between 15th and 16th Streets, with space for retail on the first floor, and four floors above ground that include 420 parking stalls.
- At Clark College, just north of the terminus station, with space for retail or C-TRAN services on the first floor, and five floors that include approximately 1,910 parking stalls.

Ruby Junction Maintenance Facility Expansion

The Ruby Junction Maintenance Facility in Gresham, Oregon, would need to be expanded to accommodate the additional LRVs associated with the CRC project. Improvements include additional storage for LRVs and other maintenance material, expansion of LRV maintenance bays, and expanded parking for additional personnel. A new operations command center would also be required, and would be located at the TriMet Center Street location in Southeast Portland.

Local Bus Route Changes

As part of the CRC project, several C-TRAN bus routes would be changed in order to better complement the new light rail system. Most of these changes would re-route bus lines to downtown Vancouver where riders could transfer to light rail. Express routes, other than those listed below, are expected to continue service between Clark County and downtown Portland. The following table (Exhibit 1-1) shows anticipated future changes to C-TRAN bus routes.

Exhibit 1-1. Proposed C-TRAN Bus Routes Comparison

C-TRAN Bus Route	Route Changes
#4 - Fourth Plain	Route truncated in downtown Vancouver
#41 - Camas / Washougal Limited	Route truncated in downtown Vancouver
#44 - Fourth Plain Limited	Route truncated in downtown Vancouver
#47 - Battle Ground Limited	Route truncated in downtown Vancouver
#105 - I-5 Express	Route truncated in downtown Vancouver
#105S - I-5 Express Shortline	Route eliminated in LPA (The No-Build runs articulated buses between downtown Portland and downtown Vancouver on this route)

Steel Bridge Improvements

Currently, all light rail lines within the regional TriMet MAX system cross over the Willamette River via the Steel Bridge. By 2030, the number of LRVs that cross the Steel Bridge during the 4-hour PM peak period would increase from 152 to 176. To accommodate these additional trains, the project would retrofit the existing rails on the Steel Bridge to increase the allowed light rail speed over the bridge from 10 to 15 mph. To accomplish this, additional work along the Steel Bridge lift spans would be needed.

1.2.2.4 Tolling

Tolling cars and trucks that use the I-5 river crossing is proposed as a method to help fund the CRC project and to encourage the use of alternative modes of transportation. The authority to toll the I-5 crossing is set by federal and state laws. Federal statutes permit a toll-free bridge on an interstate highway to be converted to a tolled facility following the reconstruction or replacement of the bridge. Prior to imposing tolls on I-5, Washington and Oregon Departments of Transportation (WSDOT and ODOT) would have to enter into a toll agreement with U.S. Department of Transportation (DOT). Recently passed state legislation in Washington permits WSDOT to toll I-5 provided that the tolling of the facility is first authorized by the Washington legislature. Once authorized by the legislature, the Washington Transportation Commission (WTC) has the authority to set the toll rates. In Oregon, the Oregon Transportation Commission (OTC) has the authority to toll a facility and to set the toll rate. It is anticipated that prior to tolling I-5, ODOT and WSDOT would enter into a bi-state tolling agreement to establish a cooperative process for setting toll rates and guiding the use of toll revenues.

Tolls would be collected using an electronic toll collection system: toll collection booths would not be required. Instead, motorists could obtain a transponder that would automatically bill the vehicle owner each time the vehicle crossed the bridge, while cars without transponders would be tolled by a license-plate recognition system that would bill the address of the owner registered to that license plate.

The LPA proposes to apply a variable toll on vehicles using the I-5 crossing. Tolls would vary by time of day, with higher rates during peak travel periods and lower rates during off-peak periods. Medium and heavy trucks would be charged a higher toll than passenger vehicles. The traffic-related impact analysis in this FEIS is based on toll rates that, for passenger cars with transponders, would range from \$1.00 during the off-peak to \$2.00 during the peak travel times (in 2006 dollars).

1.2.2.5 Transportation System and Demand Management Measures

Many well-coordinated transportation demand management (TDM) and transportation system management (TSM) programs are already in place in the Portland-Vancouver Metropolitan region and supported by agencies and adopted plans. In most cases, the impetus for the programs is from state-mandated programs: Oregon's Employee Commute Options (ECO) rule and Washington's Commute Trip Reduction (CTR) law.

The physical and operational elements of the CRC project provide the greatest TDM opportunities by promoting other modes to fulfill more of the travel needs in the project corridor. These include:

- Major new light rail line in exclusive right-of-way, as well as express bus and feeder routes;
- Modern bicycle and pedestrian facilities that accommodate more bicyclists and pedestrians, and improve connectivity, safety, and travel time;
- Park and ride lots and garages; and
- A variable toll on the highway crossing.

In addition to these fundamental elements of the project, facilities and equipment would be implemented that could help existing or expanded TSM programs maximize capacity and efficiency of the system. These include:

- Replacement or expanded variable message signs or other traveler information systems in the CRC project area;
- Expanded incident response capabilities;
- Queue jumps or bypass lanes for transit vehicles where multi-lane approaches are provided at ramp signals for entrance ramps;
- Expanded traveler information systems with additional traffic monitoring equipment and cameras, and
- Active traffic management.

1.2.3 LPA Construction

Construction of bridges over the Columbia River is the most substantial element of the project, and this element sets the sequencing for other project components. The main river crossing and immediately adjacent highway improvement elements would account for the majority of the construction activity necessary to complete this project.

1.2.3.1 Construction Activities Sequence and Duration

The following table (Exhibit 1-2) displays the expected duration and major details of each element of the project. Due to construction sequencing requirements, the timeline to complete the initial phase of the LPA with highway phasing is the same as the full LPA.

Exhibit 1-2. Construction Activities and Estimated Duration

Element	Estimated Duration	Details
Columbia River bridges	4 years	<ul style="list-style-type: none"> Construction is likely to begin with the bridges. General sequence includes initial preparation, installation of foundation piles, shaft caps, pier columns, superstructure, and deck.
Hayden Island and SR 14 interchanges	1.5 - 4 years for each interchange	<ul style="list-style-type: none"> Each interchange must be partially constructed before any traffic can be transferred to the new structure. Each interchange needs to be completed at the same time.
Marine Drive interchange	3 years	<ul style="list-style-type: none"> Construction would need to be coordinated with construction of the southbound lanes coming from Vancouver.
Demolition of the existing bridges	1.5 years	<ul style="list-style-type: none"> Demolition of the existing bridges can begin only after traffic is rerouted to the new bridges.
Three interchanges north of SR 14	4 years for all three	<ul style="list-style-type: none"> Construction of these interchanges could be independent from each other or from the southern half of the project. More aggressive and costly staging could shorten this timeframe.
Light rail	4 years	<ul style="list-style-type: none"> The river crossing for the light rail would be built with the bridges. Any bridge structure work would be separate from the actual light rail construction activities and must be completed first.
Total Construction Timeline	6.3 years	<ul style="list-style-type: none"> Funding, as well as contractor schedules, regulatory restrictions on in-water work, weather, materials, and equipment, could all influence construction duration. This is also the same time required to complete the smallest usable segment of roadway – Hayden Island through SR 14 interchanges.

1.2.3.2 Major Staging Sites and Casting Yards

Staging of equipment and materials would occur in many areas along the project corridor throughout construction, generally within existing or newly purchased right-of-way or on nearby vacant parcels. However, at least one large site would be required for construction offices, to stage the larger equipment such as cranes, and to store materials such as rebar and aggregate. Suitable sites must be large and open to provide for heavy machinery and material storage, must have waterfront access for barges (either a slip or a dock capable of handling heavy equipment and material) to convey material to the construction zone, and must have roadway or rail access for landside transportation of materials by truck or train.

Three sites have been identified as possible major staging areas:

1. Port of Vancouver (Parcel 1A) site in Vancouver: This 52-acre site is located along SR 501 and near the Port of Vancouver's Terminal 3 North facility.
2. Red Lion at the Quay hotel site in Vancouver: This site would be partially acquired for construction of the Columbia River crossing, which would require the demolition of the building on this site, leaving approximately 2.6 acres for possible staging.
3. Vacant Thunderbird hotel site on Hayden Island: This 5.6-acre site is much like the Red Lion hotel site in that a large portion of the parcel is already required for new right-of-way necessary for the LPA.

A casting/staging yard could be required for construction of the over-water bridges if a precast concrete segmental bridge design is used. A casting yard would require access to the river for barges, including either a slip or a dock capable of handling heavy equipment and material; a large area suitable for a concrete batch plant and associated heavy machinery and equipment; and access to a highway and/or railway for delivery of materials.

Two sites have been identified as possible casting/staging yards:

1. Port of Vancouver Alcoa/Evergreen West site: This 95-acre site was previously home to an aluminum factory and is currently undergoing environmental remediation, which should be completed before construction of the CRC project begins (2012). The western portion of this site is best suited for a casting yard.
2. Sundial site: This 50-acre site is located between Fairview and Troutdale, just north of the Troutdale Airport, and has direct access to the Columbia River. There is an existing barge slip at this location that would not have to undergo substantial improvements.

1.2.4 The No-Build Alternative

The No-Build Alternative illustrates how transportation and environmental conditions would likely change by the year 2030 if the CRC project is not built. This alternative makes the same assumptions as the build alternatives regarding population and employment growth through 2030, and also assumes that the same transportation and land use projects in the region would occur as planned. The No-Build Alternative also includes several major land use changes that are planned within the project area, such as the Riverwest development just south of Evergreen Boulevard and west of I-5, the Columbia West Renaissance project along the western waterfront in downtown Vancouver, and redevelopment of the Jantzen Beach shopping center on Hayden Island. All traffic and transit projects within or near the CRC project area that are anticipated to be built by 2030 separately from this project are included in the No-Build and build alternatives. Additionally, the No-Build Alternative assumes bridge repair and continuing maintenance costs to the existing bridge that are not anticipated with the replacement bridge option.

1.3 Methods

The project team collected data for this report in phases, the methods of which are described in greater detail in Chapter 2 of this report. The team reviewed existing historic resources surveys and information from the Washington State Department of Archeology and Historic Preservation (DAHP), City of Vancouver, Clark County, the Oregon State Historic Preservation Office (SHPO), City of Portland, National Park Service (NPS), local museums, and published research. The team also conducted windshield surveys and prepared initial existing conditions analyses of a large area called the area of potential impact (API). This provided a broad basis from which to identify areas of potentially high concentrations of historic buildings.

The project team, including federal partners, coordinated with SHPO, DAHP, and concerned Indian tribes to determine the area of potential effect (APE) and survey requirements. The project's historic resources team surveyed the primary APE by mapping, photographing, and describing each resource constructed prior to 1967 (listed on inventory forms and entered in the State's databases). Resources were inventoried using the 1967 construction date to take into consideration resources that would become 50 years old within the time allotted for the project to be constructed. The historic resources team compared the information gathered regarding historic resources with project maps and potential right-of-way acquisitions to determine what resources could be affected.

For a complete discussion of data gathering and analytical methods, please refer to Chapter 2 of this report.

1.4 Historic Built Environment General Findings

1.4.1 Section 106

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to take into account the effects of federal projects on historic properties and to provide the Advisory Council on Historic Preservation (ACHP) reasonable opportunity to comment on the proposed project and its effects to historic resources.

Within the primary Area of Potential Effect (APE) (described in Chapter 2), 877 resources (dated 1967 or before) were inventoried. The determinations of eligibility were submitted to the respective State Historic Preservation Officers (SHPO in Oregon and DAHP in Washington). Following their reviews and discussions with CRC project staff, 201 structures were determined to be National Register of Historic Places (NRHP)-listed historic properties or NRHP-eligible historic resources.

The downtown Vancouver area contains numerous historic resources. Fourteen (14) are listed in the NRHP; over a dozen more are listed in the Clark County Register; and additional resources have been identified as eligible for listing. The CRC project team identified many more potentially eligible resources. Chapter 4 of this report describes in more detail the Section 106 evaluations of effect on the historic resources directly affected. These findings will inform the evaluation and “use” of the historic properties that qualify as Section 4(f) resources (refer to the Section 4(f) Technical Report for more information).

1.5 Long-term Effects

Property acquisitions and physical changes are the primary sources of long-term and direct effects to known and potential historic resources. Effects can also result from ancillary changes, including but not restricted to changes in setting, traffic, noise, air and aesthetics. The effects of traffic on historic properties include impacts due to noise levels and air quality. Similarly, traffic and transportation analyses inform the discussion of changes in traffic patterns that might affect known or potential historic properties. The discussion of the project’s effects to the visual environment and overall settings associated with historic resources are based in large part on the visual resources impact analysis, as well as on public input regarding the importance of setting. Beneficial effects may include improved access to historic community resources. The thresholds used for determining substantial impacts in these other disciplines are the same ones used for the Section 106 assessments.

Construction impacts within the APE may result in the loss, destruction, or other important alteration of the historic character or integrity of significant cultural or historical resources. These potential effects have been evaluated in the Section 106 process, and the project team has completed Findings of Effect (FOE) and associated mitigations for inclusion in a Memorandum of Agreement (MOA).

Removing or otherwise substantially altering the existing and historic I-5 bridges constitutes a significant change to the region’s historic fabric. The NRHP-listed 1917 northbound I-5 bridge has been a critical part of the transportation system and historic landscape for both Oregon and Washington since it was built; and substantial alteration to or removal of the bridge would result in an adverse effect. Substantial changes or removal of the 1958 (southbound) I-5 bridge, which

was determined not NRHP-eligible, would not be considered an adverse effect, but its loss or alteration would alter the historic visual identity of the I-5 river crossing.

The location and design of the new LPA facilities will also cause an adverse effect to the Vancouver National Historic Reserve (VNHR). This would be a regional effect, because most of the VNHR is a designated National Historic Site (NHS) and an NRHP District, and because of the Reserve's defining contribution to regional identity and history.

Exhibit 1-3 provides a summary of information regarding the effects to historic properties. The LPA would affect 19 historic properties. Of these, three have been determined to be adverse effects. The LPA would require removal of the NRHP-listed 1917 I-5 bridge and the displacement of the Pier 99 building, which are adverse effects to these structures. Numerous impacts to the Vancouver National Historic Reserve (and associated District) would also constitute an adverse effect.

1.6 Temporary Effects

There are temporary construction easements required at over one dozen locations that have been listed or determined eligible for listing on the NRHP. Some of the more prominent sites include the St. James Church, W. Foster Hidden House, and the Telephone Exchange Building. These temporary construction easements are necessary to rebuild sidewalks and construct retaining walls. The LPA may also have the temporary effects listed below on historic properties. Please see Chapter 5 of this report for a complete list of temporary effects to historic properties.

- Temporary construction easements for construction staging areas. This analysis is based on current assumptions regarding construction, which may change as the project planning advances.
- Noise impacts due to construction.
- Vibration from construction.
- Effects to air quality due to construction equipment.
- Traffic spillover during construction.
- Traffic detours and delays during construction.

1.7 Mitigation

Where property acquisition or other proximity impacts to NRHP-listed and -eligible historic built environment and/or cultural landscape resources are unavoidable and the project causes an adverse effect to the resource, mitigation plans will be designed and drafted in cooperation with the Oregon SHPO, Washington DAHP, NPS, local jurisdictions, other vested agencies, FHWA, and FTA. Depending on the resources, mitigation measures may include interpretive panels, photo documentation, Historic American Building Survey/Historic American Engineering Record (HABS/HAER) reporting, historic context statements, or other measures as agreed upon. Cultural resource mitigation measures must be approved in an MOA prior to issuance of the National Environmental Protection Act (NEPA) Environmental Impact Statement (EIS) Record of Decision (ROD).

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Exhibit 1-3. Summary of Long-term Direct Effects on Historic Resources

ID	Parcel ID#/Address	Resource Name	Direct Effects				Findings of Effect
			Permanent Acquisition	Permanent Easement	Access/Parking	Noise/Vibration	
OR 1	R951340820/ 1415 Marine Drive	Pier 99	Displacement 54,540 sq.ft.		NA, Resource Displaced		Adverse
OR 2		Oregon Slough Levee	330 l.f.	-	-	-	No adverse effect
381		I-5 1917 Bridge (northbound)	Displacement	-	NA, Resource Displaced	-	Adverse
368, 369, 918, 109	038279906, 038279927, 038279911, 038279935	(VNHR)	72,787 sq.ft.	7176 sq.ft.	-	Highway noise impacts	Adverse
OR 3	Bridge No. 02733	Willamette River (Steel) Bridge	Minor modification to recently added components	-	-	-	No adverse effect
368	38279906A 610 E 5th Street	Post/Barracks Hospital (VNHR)	12,914 sq.ft.	-	-	Highway noise impacts	Adverse
109	38279935 SW Columbia Way	Apple Tree Park (VNHR)	-	209 sq.ft. for airspace	-	-	No adverse effect
10	47840000 515 Washington Street	Smith Tower	-	-	Loss of Washington Access and loss of access to underground stalls	-	No adverse effect
149	038820000 318 E 7th Street	Normandy Apartments	481 sq.ft.	-	-	-	No adverse effect
11	47940000 114 W 6th Street	Schofield Building	-	-	Adjacent parking changed to right-in/right-out only	-	No Effect
13	47930000 111 W 7th Street	Vacant Commercial	-	-	Adjacent parking changed to right-in/right-out only	-	No Effect
35	47101000 110 W 13th Street	W Foster Hidden House	-	-	Access changed to right-in/right-out only	-	No adverse effect
38	51830000 112 W 11th Street	Vancouver Telephone Exchange	-	-	Access changed to right-in/right-out only	-	No adverse effect
73	46920000 1300 Washington Street	Luepke Florist	-	-	Adjacent parking changed to right-in/right-out only	-	No Effect

ID	Parcel ID#/ Address	Resource Name	Direct Effects				Findings of Effect
			Permanent Acquisition	Permanent Easement	Access/ Parking	Noise/ Vibration	
113	40290000 1500 Broadway Street		-	-	Access changed / loss of bay door usage	-	No adverse effect
1045	39490000 1205 Broadway	Washington Mutual/ Chase Bank	-	-	Access changed to right- in/right-out only	-	No adverse effect
1043	210 E 13th Street 39630000	City Hall	-	-	Access changed to right- in/right-out only	-	No adverse effect
59	13460000 3110 K Street	-	-	1,689 sq.ft.	-	-	No adverse effect
61	13725000 3000 K Street	-	148 sq.ft.	2,156 sq.ft.	-	-	No adverse effect
62	13670000 903 E 31st Street	-	-	2,983 sq.ft.	-	-	No adverse effect
116	40890000 307 E 17th Street	-	-	-	-	Requires residential sound insulation	No adverse effect
129	41255000 404-406 E 17th Street	-	-	-	-	Requires residential sound insulation	No adverse effect
133	41380000 604 E 17th Street	-	-	-	-	Requires residential sound insulation	No adverse effect
993	Kiggins Bowl 800 E 40th Street	-	1,675 sq. ft.-	11,814 sq. ft.	One access modified	-	No adverse effect

a Not including easement needed from Apple Tree Park. This page intentionally left blank.

2. Methods

2.1 Introduction

The team reviewed existing historic resources surveys and information from DAHP, City of Vancouver, Clark County, SHPO, City of Portland, NPS, local museums, and published research. The team conducted windshield surveys and prepared initial existing conditions analyses of a large area called the area of potential impact (API). This provided a broad basis from which to identify areas of potentially high concentrations of historic buildings.

The project team coordinated with SHPO and DAHP to determine the APE and survey requirements. The historic resources team surveyed the primary APE by mapping, photographing, and describing each resource constructed prior to 1967 (listed on inventory forms and entered in the State databases). Resources were inventoried using the 1967 construction date to take into consideration resources that would become 50 years old within the time allotted for the project to be constructed. The historic resources team compared the information gathered regarding historic resources with project maps and potential right-of-way acquisitions to determine what resources could be affected.

2.2 Study Area

The CRC project seeks to improve safety, access, and capacity for traffic and transit in the I-5 corridor between approximately Victory Boulevard in Portland, Oregon and State Route (SR) 500 in Vancouver, Washington (Exhibit 2-1).

2.2.1 Area of Potential Effect

The term APE is defined in 36 Code of Federal Regulations (CFR) 800.16(d) as:

“the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.”

Pursuant to federal guidelines, the APE for the project was defined after the DEIS alternatives had been confirmed.

The APE is determined by the project’s lead agencies, the FTA and the FHWA acting through its agents, WSDOT and the ODOT. FTA has deferred to FHWA for compliance with Section 106, Section 4(f), Section 6(f), and government-to-government consultation with the relevant Indian tribes. FTA has not delegated to FHWA authority to act on its behalf. All substantive decisions that affect FTA’s ability to meet its responsibilities will remain with FTA. As a co-lead agency, FHWA coordinated with the DAHP and SHPO.

The first phase of the project evaluated two study areas for environmental effects: the primary and secondary APIs. The primary API addressed direct impacts. Secondary APIs were the analysis units for indirect impacts. The primary API extended about 5 miles from north to south, starting north of the I-5/Main Street interchange in Washington, and running south to the I-5/Columbia Boulevard interchange in Oregon. North of the river, the API extended west into downtown Vancouver, and east to near Clark College to include potential high-capacity transit (HCT) alignments and park and ride locations. Around the actual river crossing, the eastern and western sides each extended 0.25 mile from the I-5 right-of-way. South of the river crossing, this

width narrowed to 300 feet on each side. The secondary API, over 15 miles long, ran from approximately 1 mile north of the I-5/I-205 interchange south to the I-5/I-84 interchange. It also extended 1 mile on both the east and west sides of the I-5 right-of-way. Initially, the project team concentrated historic resource inventories within the primary API.

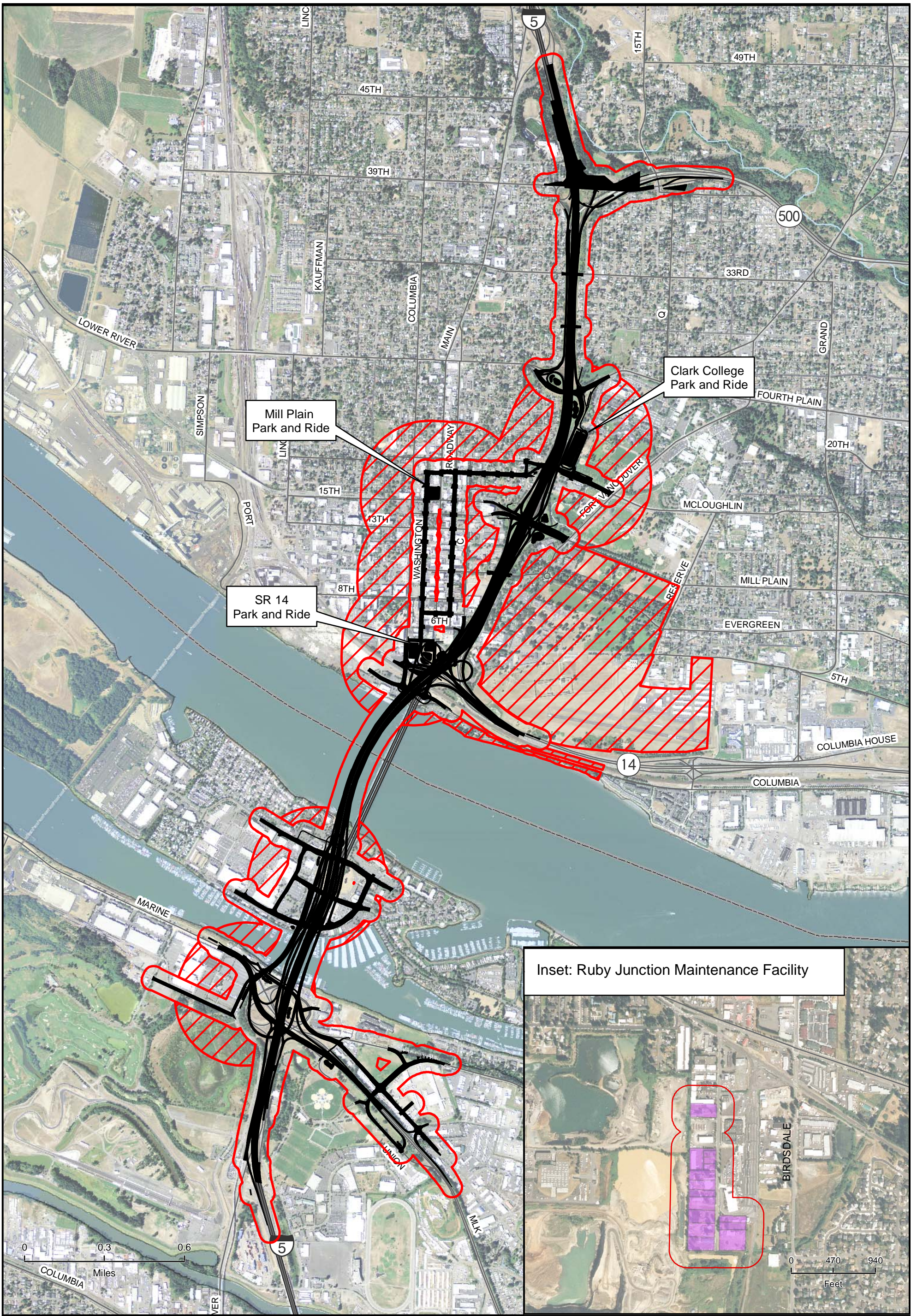
The preliminary area of potential effect (APE) was developed based on the preliminary evaluation of the API and other project information, through coordination with DAHP and SHPO and in accordance with the NHPA and the guidance of the Section 106 Programmatic Agreement between the FHWA, WSDOT and DAHP.

The APE extends approximately one city block (200 feet) on either side of the project footprint. This is the area in which direct impacts such as property acquisition and construction effects are expected to occur, as well as secondary direct impacts from noise, traffic, etc. that could alter the resource's atmosphere, setting, or character-defining features. The APE also includes areas identified for project staging, for casting of concrete segments, and to meet the demands the expanded light rail network. The expansion of the light rail network, with a 3-mile extension into Vancouver, requires two remote project components to be considered for their impacts to cultural and other resources. Servicing light rail vehicles occurs at a maintenance facility in Gresham, Oregon; the LPA includes plans to expand this facility, which will require the displacement of surrounding structures. Secondly, a minor retrofit of the transit guideway rails on the Steel Bridge in Portland is planned to allow for higher speeds across the bridge.

Indirect impacts include effects resulting from (distant and later) economic and land use changes. These are discussed in the Indirect Impacts Technical Report.

The secondary APE was based on a 0.25-mile buffer around transit stations, where redevelopment and other indirect impacts are most likely. Exhibit 2-1 shows the current APE's historic-period built environment area of concern, as described below. Besides the APE, Exhibit 2-2 shows the potential staging areas and casting yards, the Steel Bridge, and the Ruby Junction Maintenance Facility.

Following the selection of the LPA, the potential for impacting historic properties along the northern (to Kiggins Bowl) high-capacity transit alignments was eliminated. Despite the APE's coverage of the residential areas in the Lincoln, Carter Park, and other northern neighborhoods, this report no longer addresses direct impacts in this area.



- APE - Area of Potential Effect (200 ft. buffer of design)
- APE - Area of Potential Effect (VNHR and 0.25 mile buffers of transit stops)
- Maintenance Area Parcels
- Project Footprint

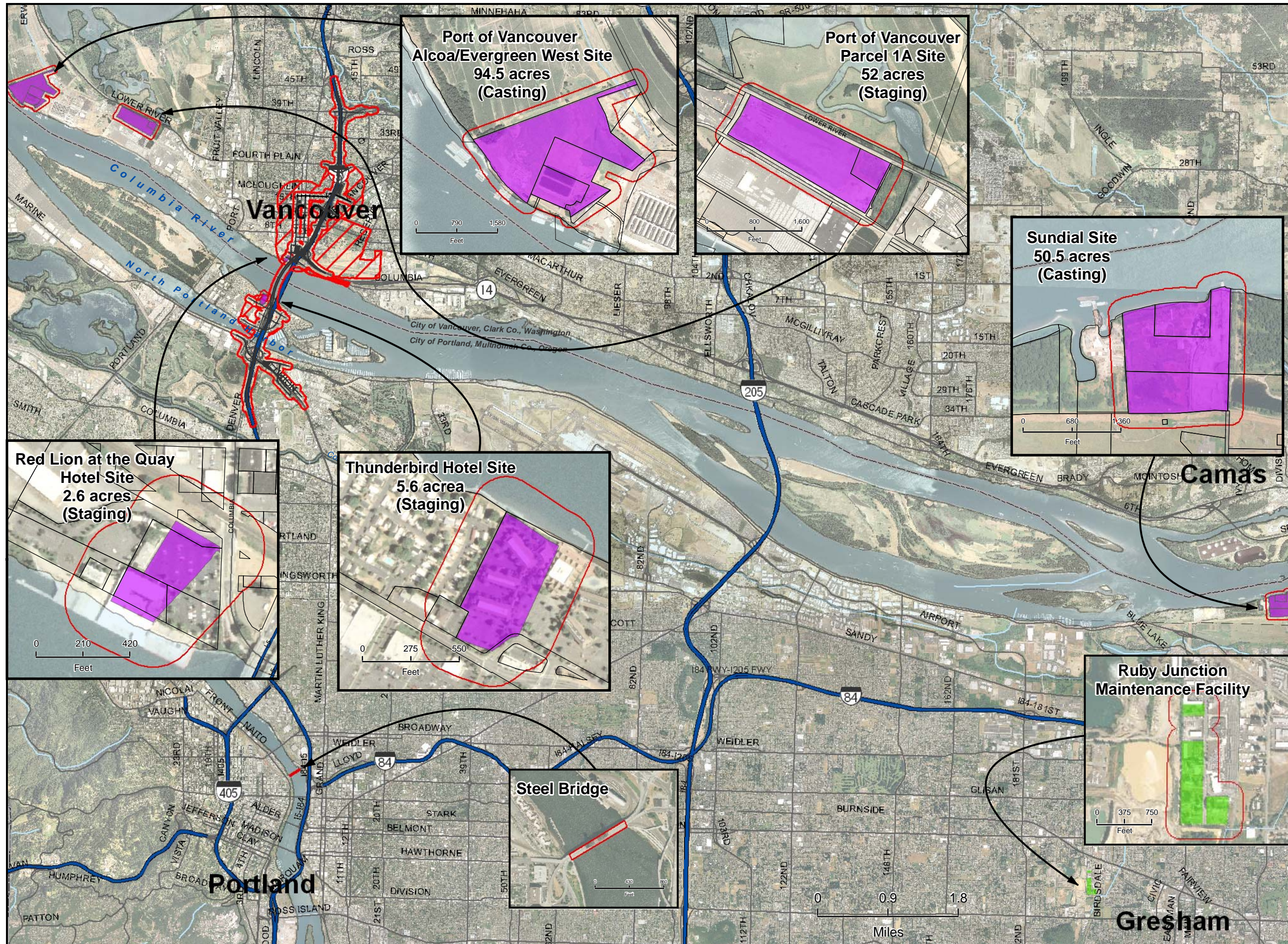
Inset: Ruby Junction Maintenance Facility






Exhibit 2-1. Preliminary Area of Potential Effect (APE) Historic-Period Built Environment

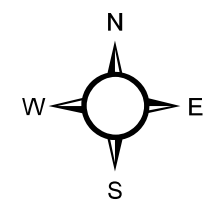


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Exhibit 2-2.
Areas of Potential Effect (APE)
for the Project Area, Potential
Staging Areas and Casting
Yards, Steel Bridge, and Ruby
Junction Maintenance Facility



-  Project Footprint
-  Proposed Staging and Casting Areas
-  Ruby Junction Maintenance Facility
-  APE - Potential Direct Effect (200 ft. buffer)
-  APE - Potential Indirect Effect



Analysis by J. Koloszar; Analysis Date: May 18, 2010; File Name: ...\\HISTORIC\Stage_Cast_DC212_woutSteelB.mxd

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2.3 Effects Guidelines

To determine effects to historic properties, one first has to determine if historic resources are NRHP-listed or -eligible and thus subject to the NHPA. The project team determined the NRHP eligibility of historic resources based on the criteria set forth in 36 CFR part 800 (Section 106) and detailed in National Register Bulletin 15 – How to Apply the National Register Criteria for Evaluation. Typically, a historic resource is a site, structure, building, or object. In some situations, the historic resources may be combined into a district, provided there is close continuity in theme association between them. A historic resource must maintain enough integrity with respect to original design and construction to determine its NRHP eligibility in accordance with Criteria for Evaluation (a), (b), (c), or (d), and potentially with NRHP Criteria Considerations (a) through (f). These criteria and considerations are detailed below.

Criteria for Evaluation. The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

- (a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) That are associated with the lives of persons significant in our past; or
- (c) That embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (d) That have yielded, or may be likely to yield, information important in prehistory or history.

Criteria Considerations. Criteria considerations are applicable to properties, structures, etc. that are not ordinarily considered eligible for the National Register. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

- (a) A religious property deriving primary significance from architectural or artistic distinction or historical importance; or
- (b) A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
- (c) A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life; or
- (d) A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or
- (e) A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or

(f) A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or

(g) A property achieving significance within the past 50 years if it is of exceptional importance.

Historic resource integrity depends on the following considerations:

- Location - The place where the historic property was constructed or the historic event occurred.
- Design - The combination of elements that create the form, plan, space, structure, and type of site.
- Setting - The physical environment of the resource.
- Materials - The construction elements as they were combined during a particular period of time or configuration.
- Workmanship - The physical evidence of the crafts used (e.g., manufacturing techniques) of a culture or people, provided they are matched by one or more of the previous four integrity factors.
- Feeling - Presence of physical features that evoke a sense of the resource's character or underlying life pattern.
- Association - A direct link between an important event or person and the resource's attributes.

The project consultant team, in coordination with WSDOT and ODOT, provided DAHP and SHPO copies of resource forms, investigation reports, and solicitations for their concurrence regarding the NRHP eligibility of discovered resources.

A historic "resource" becomes a historic "property" once it is listed in the NRHP or determined to be NRHP-eligible. For purposes of this analysis, historic resources that are determined to be "potentially NRHP-eligible" are treated as NRHP-listed historic properties.

The boundary of a historic property is generally based on the tax lot on which the structure, building, or object rests. Historic property boundaries are sometimes reduced if the entire lot does not contribute to the NRHP-eligibility of a historic property. Potential NRHP district boundaries are based on groupings of resources on tax lots. The boundaries have been adjusted where empirical evidence and professional judgment suggest different geographic distribution of the attributes that renders a resource significant pursuant to Section 106 procedures.

The project attempts to avoid impacts, minimize unavoidable impacts, and mitigate for adverse impacts to historic properties. According to NHPA Section 106, an "adverse effect" to an individual property would result if the project caused direct loss, destruction, or alteration of the historic character or integrity of the significant (or NRHP-listed or -eligible) historic property. Indirect impacts (such as changes in visual setting, aesthetics, noise, traffic, or use) that affect the integrity of the property's location, setting, feeling, or association may also result in an adverse effect, as specified in 36 CFR 800.5.

NEPA Considerations. An "adverse effect" finding pursuant to the NHPA is often, but not always, considered a "significant" adverse impact pursuant to NEPA. However, NHPA adverse effect and NEPA significant adverse impact findings may be sufficiently minimized by implementation of mitigation measures through an MOA between SHPO and the lead agency(ies).

Section 4(f) Considerations. Historic properties that are NRHP-listed or determined to be NRHP-eligible are also subject to Section 4(f) provisions of the Department of Transportation Act of 1966. In addition, properties that are protected by state or local regulations (such as Oregon Statewide Planning Goal 5) but that are determined to be ineligible for NRHP listing may still be subject to Section 4(f) evaluation requirements. An indirect traffic, noise, or visual setting impact or use that does not require historic property acquisition or displacement may constitute a “constructive use” if the property is a Section 4(f) resource; however, this rarely occurs because of exceptionally rigorous threshold tests for “constructive use.”

The FHWA and FTA maintain ultimate authority for Section 4(f) determinations.

The assessment of effect to each historic property is preliminary, and is based on project mapping with some registration discrepancies. The potential effects assessments may be modified based on refined designs and maps and ongoing coordination with DAHP, SHPO, and other consulting parties.

2.4 Data Collection Methods and Phasing

Potential cumulative effects from this project are evaluated in the Cumulative Effects Technical Report. Please refer to that report for an evaluation of possible cumulative effects.

Data for evaluating historic resources in the APE were collected in two phases. The data collection activities for each of these phases are detailed below.

2.4.1 Phase I Data Collection

Phase I historic resources data collection included the following steps.

Preliminary Background Research

The project team reviewed source materials on file at DAHP, SHPO and the Portland Historic Resource Inventory to identify: properties designated as NRHP-listed or -eligible, State of Washington-listed historic resources, Oregon Statewide Planning Goal 5-protected historic or archaeological resources, and locally designated historic resources. The project team identified and reviewed primary data site forms and other secondary data sources regarding the historic built environment.

Site Reconnaissance Visits

The project team conducted a reconnaissance survey of the primary APE to confirm the presence of buildings, structures, sites, objects, and districts identified during preliminary research, including those constructed before 1967 that may be eligible for NRHP listing.

Significance Evaluation

The project team used NRHP criteria to evaluate the Section 106 “significance” of resources as part of the reconnaissance-level survey process. The research and database were sent to SHPO and DAHP for concurrence and are pending final submittal of inventory forms and database entry.

1957-1967 Resources

In addition to resources constructed more than 50 years ago (using a base year of 1957), historic resources constructed up to 1967 have been inventoried, since the CRC project may not be built for up to 10 years.

2.4.2 Phase II Data Collection

Data collection efforts during Phase II included the following tasks.

2.4.2.1 Section 106 Process

Methods Refinement

The project team worked with ODOT and WSDOT, DAHP and SHPO, to refine the research plans, inventory techniques, and analytical methods for identifying and evaluating the range of impacts.

Background Research

The project team used source materials on file at DAHP and SHPO to identify NRHP-listed or -eligible properties, State of Washington-listed historic resources, and Oregon Statewide Planning Goal 5-protected historic resources, and locally designated historic resources to identify additional properties added to lists since the Phase I background research was conducted. The project consultant team also reviewed archives at the Fort Vancouver NHS, Clark County, the City of Vancouver, and the City of Portland.

Reconnaissance Historic Resources Inventory

The project team conducted a historic resources inventory to identify, map, and photograph NRHP-listed and -eligible properties. They used inventory forms and entered information into a database as specified by WSDOT, DAHP, ODOT and SHPO.

SHPO Determination of Eligibility

Historic properties identified in the APE not already listed or officially considered eligible were documented using Determination of Eligibility (DOE) forms. SHPO staff reviewed these for concurrence with NRHP-eligible properties.

DAHP Database

Historic properties identified in the APE were recorded in the DAHP electronic historic resources database. DAHP staff reviewed these entries for concurrence with NRHP-eligible properties. Following the DAHP review, 29 additional properties in Washington were agreed to have been determined eligible.

Findings of Effect

The project team prepared FOE reports for Oregon properties formally determined to be NRHP-eligible. The team evaluated project effects to NRHP-eligible and -listed resources in Washington; these results are reported in Chapter 5 of this technical report using the Criteria of Effect and Adverse Effect established in 36 CFR 800 to determine level of effect.

Technical Report

The DEIS Historic Resources Technical Report documented methods used, cultural resources encountered, beneficial and adverse effects of alternatives on historic resources, and recommended mitigation measures for unavoidable adverse effects such resources. The report formed the basis of the discussion of historic resources in the DEIS. This Technical Report (part of and in support of the Final Environmental Impact Statement [FEIS]) provides updates on eligibility determinations and specifics regarding the effects of the LPA.

Memorandum(s) of Agreement (MOA)

Since there are adverse effects to NRHP-listed or -eligible properties, a Phased Project MOA will be prepared. The MOA development and approval process will primarily focus on:

- Resolving the known unavoidable adverse effects, primarily through mitigation, and
- Determining the phased and programmatic process by which remaining property identification, significance evaluation, effects assessment, and resolution of adverse effects will be implemented.

A completed/signed Section 106 MOA will be referenced in the FEIS.

Section 4(f) Evaluation(s)

The project team prepared Section 4(f) evaluations for historic properties whose NRHP-qualifying characteristics, or other criteria for locally significant historic resources, may be “used” by the proposed project. These evaluations are documented in the 4(f) Appendix of the FEIS.

2.4.3 Data Sources

- DAHP - Historical site records, resource maps, and library
- SHPO - Historical site records, resource maps, and library
- NPS - Historical information regarding sites on VNHR
- Clark County Inventory - Historic inventory records and Clark County Heritage Register
- Clark County - Tax Records
- City of Vancouver - Historic inventory records
- City of Portland - Historic inventory
- Metro Maps
- Portland Maps Information Service
- Multnomah County - Tax records
- Field investigations
- Reconnaissance survey to confirm and/or modify existing data, and locate and record previously non-inventoried historic resources.

2.5 Analysis Methods

2.5.1 Long-term Operational Impacts Approach

Operational impacts to historic properties depend on the findings of ancillary studies, including traffic, noise, air, vibration, and aesthetics. Typically, such impacts help define the historic resources area of concern for the APE and characteristics of the resource that make it NRHP-eligible. Unless the property's characteristic is unusually sensitive to traffic volumes, noise levels, air quality, vibration levels, or aesthetic views, the criteria used in those analyses serve as the threshold for determining effect. Beneficial effects may include improved access to historic community resources.

2.5.2 Cumulative Impact Analysis Approach

Cumulative impacts may occur when a project's effects are combined with those from past, present, and reasonably foreseeable future projects. They can result from individually small but collectively substantial actions that occur over a long period of time. Specific elements, like the appropriate base year and the geographic scale of analysis, may vary by discipline area. Please refer to the Cumulative Impacts Technical Report for further information.

2.6 Coordination

The project consultant team coordinated with DAHP, SHPO, Native American Tribal governments, WSDOT, ODOT, local planners and municipal historic preservation specialists, historical commissions and societies, private interest groups, and other involved or interested agencies. All formal consultations with tribal governments were channeled through FHWA, acting through its WSDOT and ODOT agents. Coordination included, but was not limited to, the interactions described below.

The CRC internal Cultural Resources Group included DOT archaeology and historic built environment cultural specialists, CRC environmental project management staff, and cultural resources consultants. This group met bi-weekly to discuss status, approaches, and issues and to provide guidance.

The Historic Resources Technical Advisory Group included members of the CRC Cultural Resources Group and representatives from the City of Vancouver, City of Portland, FHWA cultural specialists, NPS historic resource specialists, and Section 106 historic resources specialists from DAHP and SHPO. This group met several times.

The Cultural Resources/Section 4(f) Work Group (CWG) included parties with regulatory interests in project-area historic, archaeological, cultural, and other Section 4(f) resources. This group met on an as-needed basis, as determined appropriate by WSDOT and ODOT historic resources, archaeological/cultural resources, and Section 4(f) specialists.

The CRC identified Consulting Parties pursuant to requirements and guidelines in 36 CFR 800.

The project consultant team and WSDOT management coordinated with ODOT and WSDOT (as agents of FHWA and FTA), DAHP, SHPO, and other Consulting Parties to define and refine the appropriate APE for the project. Comments were received and considered. The project team coordinated with DAHP and SHPO to solicit concurrence on NRHP eligibility for evaluated historic resources. The project consultant team solicited input from local jurisdictions on potential historic resources found to be ineligible for NRHP listing by DAHP or SHPO, but potentially subject to local historic resources protection provisions. The project team solicited concurrence

from DAHP and SHPO on level of effect for properties formally determined to be eligible for the NRHP.

The project team solicited input from local jurisdictions on whether any historic resource found to have local historic significance but not meeting NRHP eligibility criteria would be adversely affected by the project, considering local impact assessment criteria.

Beginning in 2005, meetings were held with representatives from federal and state regulatory agencies to provide input on this project. Agencies included the City of Portland; ODOT; WSDOT; the City of Vancouver, Community Planning; NPS; Fort Vancouver National Trust and Fort Vancouver National Historic Site; DAHP; and SHPO. Native American Tribes with resource interests relevant to this project also provided input and guidance during several meetings: Chinook, Confederated Tribes of Grand Ronde, Confederated Tribes of the Umatilla Indian Reservation, Confederated Tribes of Warm Springs, Cowlitz Indian Tribe, Nez Perce Tribe, Siletz Tribe, Spokane Tribe and the Yakama Nation. These meetings are summarized below:

- Frequent, and at times biweekly, Cultural Resources Technical Group meetings with WSDOT, ODOT, FHWA, and CRC team.
- Feb. 15, 2006: Cultural Resources/Section 4(f) Workgroup Resources Meeting. Invitees: WSDOT, ODOT, Cowlitz, Tri Met, NPS, C TRAN, FHWA, Grande Ronde, SHPO, City of Vancouver, FTA, Metro, DAHP, City of Portland.
- March 20, 2007: The Columbia River Crossing History Seminar in Vancouver included presentations by representatives of the Chinook, Cowlitz, Grande Ronde, Nez Perce, Yakama, Siletz, Spokane, Umatilla, and Warm Springs Tribes, as well as a presentation on settlement history in the project area by local scholars.

During the course of proposed project development, project management staff met several times with the NPS cultural resources and management staff of the Fort Vancouver NHS and VNHR to exchange information about the proposed project and its potential effects on historic resources associated with the Reserve.

Since publication of the DEIS, the project met with the Cowlitz Indian Tribe, the Columbia River Inter-Tribal Fish Commission, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Colville Nation, the Confederated Tribes of Grand Ronde, the Nez Perce, the Confederated Tribes of Siletz Indians of Oregon, the Confederated Tribe of Warm Springs, and the Spokane Tribe of Indians. Project staff has also attended a number of regional meetings and conferences, providing more general updates to tribal representatives. Discussions with these tribes focused primarily on archaeology and Section 106 issues, including the programmatic MOA, the Biological Assessment process, and several conservation and mitigation measures.

Discussions with the tribes also focused on in-water work window negotiations, construction sequencing and timing, the process for developing conservation measures, and the duration and type of pile driving that might occur. Some of the tribes expressed particular concern about endangered runs of Salmonids or those species spawning or living near the project area, including chum, fall Chinook, white sturgeon, sockeye, lamprey, upper Columbia spring Chinook, lower Columbia coho, falcons, and eagles.

The project staff facilitated discussions specific to protections for historic burial sites such as the Post Cemetery, the Hudson Bay Company Cemetery, and 4th Plain Cemetery. The project invited tribal monitors and drafted an inadvertent discovery plan to be implemented in the event historic burials are discovered during construction.

In an effort to expand upon information contained in written documents, inquiries were made by CRC with consulting tribes as to their interest in conducting oral history studies about past Native American use of lands within the CRC project area. Reports were subsequently prepared by the Confederated Tribes of the Umatilla Indian Reservation (Engum 2009) and the Confederated Tribes of the Warm Springs Reservation of Oregon (Whipple 2009). The information presented in these studies was general in nature. The reports did not identify any specific cultural sites within the APE that might be addressed during the archaeological investigations for the CRC project.

The project staff has also partnered with tribal representatives to monitor geotechnical borings for the presence of cultural resources.

2.7 Cultural Resources Group

The role of the Cultural Resources Group was to:

- Provide CRC project information and updates to interest groups for review.
- Identify issues and concerns in the process, and present recommendations at key milestones to the project team.
- Provide input to the project team into relevant areas of interest or potential impact (such as air quality, noise, highway interchange alignments, and design features) to help inform the efforts to avoid, minimize and/or mitigate potential impacts of the project to historic resources.
- Communicate frequently with their respective constituency groups to provide project information, bring their input to the project team, and help develop an understanding and support of project recommendations.
- Identify historic cultural resources concerns related to the project and communicate those concerns to the project team in a timely manner.
- Provide input to the project team to assist with developing potential solutions as challenges arise on the project.

3. Affected Environment

3.1 Introduction

This section provides a brief overview of the historic resources and historic environment in the preliminary APE. A map of the APE is included as Exhibit 2-1 in the previous chapter.

3.1.1 Historic Resources in Washington

The project area in Washington extends from the Columbia River northward through the intensively developed business district and adjacent residential neighborhoods of Vancouver.

3.1.1.1 Historic Overview

People have lived in this area for approximately 12,000 years. In the historic record initial settlement by European-descended people took place in the project area with the establishment of Fort Vancouver by the Hudson Bay Company (HBC) in 1824-1825. In 1829 the fort was moved 1 mile west of its original location to a site on the floodplain 400 yards from the Columbia River (immediately east of I-5's current location). In this location, the fort served as the administrative headquarters for the HBC's Columbia Department, which administered an area from the Rocky Mountains to the Pacific Ocean, until the HBC withdrew from the region in 1860 (Freed et al. 1999).

Vancouver National Historic Reserve

In response to conflicts resulting from encroachment by American miners and settlers on Native American lands, US Army troops were detailed to the Pacific Northwest in 1849. With the HBC's permission, a military base was established to the north of the stockade at Fort Vancouver. Known as Columbia Barracks or Vancouver Barracks, this post became the headquarters and base of supply for the military offensive mounted by the US Army against Native Americans, especially during the conflicts of 1855 and 1856. This post later played a significant role in the mobilization of troops during the Civil War, the Spanish-American War, and World War I. Approximately two dozen historic buildings still stand at Vancouver Barracks; these buildings were constructed during the late 19th and early 20th centuries, when the post was the most important military installation in the Pacific Northwest (Freed et al. 1999).

In 1948, an Act of Congress authorized the creation of the Fort Vancouver National Historic Monument. It was redesignated as a National Historic Site (NHS) in 1961. In 1966, the NHS was listed in the NRHP. In recognition of the significance of the historic and archaeological resources in this area, the "Omnibus Parks and Public Lands Management Act of 1996" (Public Law 104-333) created the Vancouver National Historic Reserve (VNHR), which encompasses 366 acres in Vancouver and on which the following cultural resources are found: 1) Fort Vancouver NHS and Adjacent Cultural Landscape; 2) Vancouver Barracks and Officers Row; 3) Parade Ground; 4) Pearson Air Field; 5) Columbia River Waterfront; 6) Water Resources Area; and 7) Lewis and Clark Confluence Land Bridge.

In 2007 the VNHR Historic District was officially listed on the NRHP. The 2007-designated Historic District encompasses 252 acres in the westernmost portion of the Reserve. The VNHR Historic District is roughly bounded on the north by an alley north of Officers Row, on the east

by E Reserve Street, on the south by the Columbia River, and on the west by I-5 (Owens et. al. 2004). The district has been divided into distinct areas, including:

- Prehistoric/Contact-period, Native American Character Areas;
- Fort Vancouver Character Area (reconstructed Fort Vancouver and associated archaeological sites);
- Vancouver Barracks Character Area; this area includes subareas Officers Row, mixed-use developed area at the southwest end of the parade ground (referred to generally as the Barracks), and the 7-acre parcel of land south of E Fifth Street that contains the historic buildings associated with Pearson Field; and
- Buildings associated with the NPS Mission 66 Plan (which includes the Visitor Center, two residences, a maintenance shop, and associated roads and parking lots) (Owens et al. 2004).

The Vancouver National Historic Reserve is located in the Hudson's Bay neighborhood, directly east of I-5 between Mill Plain Boulevard and SR 14. It is one of the earliest neighborhoods in Vancouver. The Reserve occupies most of the land, but there are some private homes dating from the late 19th and early 20th century. These are two-story frame houses and 1920s style bungalows. Residential development is concentrated at the eastern portion of the neighborhood to Grand Boulevard.

I-5 Bridges

The northbound I-5 bridge was completed in 1917, connecting Vancouver and Portland. At the time it was considered an engineering feat and was one of the largest bridges in the world. It helped to stimulate the economy of the region and assisted interstate commerce. It was listed in the NRHP on July 16, 1982, as a one of the Exceptionally Significant Features of the Federal Highway System, and was excluded from the FHWA Section 106 Interstate Highway System Exemption in 2006. Interstate 5 was completed through Vancouver in 1954, using access on the 1917 bridge to Portland. A parallel and structurally connected bridge span was built in 1958 to accommodate increased traffic flow on the new highway. The 1917 bridge then handled northbound traffic, while the new, 1958 bridge handled southbound traffic. The 1958 bridge was not listed as Exceptionally Significant and was not excluded from the FHWA Section 106 Interstate Highway System Exemption in 2006.

The 1917 I-5 bridge represented an enormous financial and engineering accomplishment, shared by two counties in two states. It was designed by the renowned engineering firm Waddell and Harrington, leaders in the field of vertical lift bridge design in the 20th century. It was one of the largest bridges ever built up until that time. Beyond the feat of engineering, it signified an unprecedented degree of cooperation between two counties (Multnomah and Clark Counties) that wanted a system to replace the existing slow and inefficient ferry. The bridge paved the way for a new era in automobile transportation in the region. On January 1, 1929, Oregon and Washington purchased the interstate bridge from Multnomah and Clark Counties and abolished the five-cent tolls that had paid for the bridge in 12 years (Clarke 1993). In addition to its regional significance, the 1917 I-5 bridge has national significance for contributing to the success of the Pacific Highway; a transportation system that ran approximately 2,000 miles, from the Canadian border to the Mexican border, and that influenced the development of international economic trade.

Vancouver City Center

The central business district in Vancouver is located in the Esther Short neighborhood; it dates from the 1840s, when Amos and Esther Short platted a town site on their 640-acre Donation Land Claim west of Fort Vancouver. This area will be referred to as Vancouver City Center. The first commercial businesses were built at the southern end of Main and Washington Streets near a steamship landing on the river. The original wood-frame commercial buildings were replaced with brick buildings by the late 19th century, several with brick from the locally manufactured Hidden Brick Company (between 14th and 16th Streets). A Victorian-era house built by Lowell Mason Hidden is located on the corner of 13th and Main Streets (100 W 13th Street). Main Street was a former trail turned military road, and was part of the old US Highway 99 route (Chapman and O'Brien 2004).

Several buildings are individually listed or eligible for the NRHP, and portions of the neighborhood where the historic buildings are concentrated are potentially eligible for listing on the NRHP as Historic Districts. A Lower Main Street Historic District between Evergreen Boulevard, W Fifth Street, and Broadway and Washington Streets, with buildings ranging in date from the 1870s to 1930, was proposed in the Historic and Cultural Resources Addendum to the EIS for the Esther Short Subarea and Redevelopment Plan in 1998. A portion of this area is recognized in the Vancouver Municipal Code as a Heritage Overlay District (see below). The downtown area is roughly bounded by 16th Street on the north, I-5 on the east, the Columbia River on the south, and Esther Street on the west (Zimmer 1998). The Esther Short neighborhood includes the downtown boundaries. A National Register of Historic Places or Washington State Lower Main Street Historic District nomination was not prepared, and the district has not been officially recognized by DAHP.

The Spokane, Portland and Seattle Railway (SP&S), currently owned by BNSF, was incorporated in 1905 as a joint venture of the Great Northern Railway and Northern Pacific Railway to build a railroad along the north bank of the Columbia River. It was completed in 1908. A rail bridge crossing the Columbia connected Oregon with Washington in 1912. However, the opening of the Panama Canal in 1914 severely reduced transcontinental freight traffic, and it was not until World War II that the railroad became successful. Its success was based on its location as the only water-level route from the west slope of the Rockies to the Pacific Coast.

The City of Vancouver has adopted two Heritage Overlay Districts as part of their municipal code. These districts are intended to preserve the special architectural character and/or historic or cultural significance of certain areas within the city. The City requires specific architectural treatments and elements within the districts to ensure that new development is compatible with existing buildings; existing older buildings are preserved and restored in their original architectural style; and unique historical, cultural, and architectural environments are retained.

Heritage Overlay District Number One is primarily the site of Providence Academy, the dominant landmark and most important historic building in downtown Vancouver (20.510.020.A.1 Vancouver Municipal Code [VMC]). District Number One also includes outbuildings and the grounds of the Academy, included because of their relationship to the main building and their impact on views. The City has opted to preserve the Providence Academy through height limits, view corridor preservation, tree preservation, and limitations on signage and materials and texture of new buildings.

Heritage Overlay District Number Two consists of a concentration of older buildings between 5th Street, 11th Street, Washington Street, and Broadway Street in downtown Vancouver. Buildings in District Number Two have either been preserved in the early 1900s style or have significant key remaining characteristics of that style and are capable of restoration to their original

character. The concentration of several older buildings and remaining parts of older buildings in the area collectively provide a street facade reminiscent and characteristic of turn-of-the-century downtown Vancouver, and provide both a historical asset and the potential to recreate the original character of lower Main Street as a cultural and economic asset. The City requires that development in District Number Two must preserve key architectural features and key buildings in the District, follow design guidelines on exterior alterations and new construction, fulfill additional requirements for building heights, and make the ground levels of all new buildings fronting Main Street retail-ready.

The Region

The combination of war materials movements and cheap electric power from the Columbia River dams of the Bonneville Power Administration (BPA) resulted in the siting of major aluminum plants, sawmills, chemical facilities, and grain terminals along the line. The SP&S Railroad changed the development of the area by providing the ability to export and import goods, products and people into and through the region. In 1970, the SP&S merged with the Great Northern Railway, the Northern Pacific Railway, and the Chicago, Burlington and Quincy Railroad to form the Burlington Northern Railroad (BNRR). Although the SP&S continued to exist as a paper corporation until 1979, the separate identity of the railroad that was known as “The Northwest’s Own Railway” ended at the birth of the BNRR (SP&S 2007).

Vancouver, Washington, had two trolley railway systems. The first one, constructed in 1889, was a horse-drawn line; it was electrified in 1892, and ceased operation in 1895. In 1908 this system was replaced. In 1910 the tracks were extended east of the city to Sifton. The new system followed the route of the first, with the tracks running along Main to 26th (now Fourth Plain). The 1912 railway city route went up Main from Third Street to 26th Street, then north via K Street to Washington Street up to 39th Street (Freece 1985: p. 80). At 26th it went west to Harney, back to Third and Main via Franklin Street, and then on 11th Street to Columbia. It went east at 26th to K Street, turning north and ending at 33rd Street.

A trestle was built on 33rd Street across Burnt Bridge Creek to St. Johns Road, where car barns were erected. By 1916 automobiles had diminished the streetcar business, although tracks were laid across the new interstate bridge in 1917 to connect the street car with Portland. Service from Portland to Vancouver was cut back until cars went only to Third and Main, and the service was discontinued in 1926. Not much of the old system remains. The car barn was converted to a bus barn and then to an auto body shop (33rd Street and St. John Boulevard). The trestle is gone, and the tracks on the bridge and on Vancouver streets were covered with blacktop (Freece 1985).

The Vancouver Uptown Village district is located in the Hough (west of Main Street) and Arnada (east of Main Street) neighborhoods, and dates from approximately 1920 to 1960. Several commercial, business, and auto-related buildings are considered individually eligible for the NRHP, but only a portion of the Uptown Village District appears to have a concentration of intact historic resources that might be considered a potentially NRHP-eligible Historic District. The Uptown area is roughly bounded by Fourth Plain Boulevard on the north and McLoughlin Boulevard on the south, between Broadway and Washington Streets.

In 1961, an urban renewal project covering a total of 28 city blocks in the downtown area removed or altered many 19th and early 20th century buildings. In the 1970s the downtown area lost business from competition by shopping malls at Jantzen Beach in Portland and the Vancouver Mall (Chapman and Wilson 2006).

Vancouver Neighborhoods

The Arnada neighborhood is located a few blocks to the northeast of Vancouver's downtown business district. It is a relatively small neighborhood, occupying approximately 55 square blocks. The neighborhood boundaries are defined by Fourth Plain Boulevard to the north, I-5 to the east, 16th Street to the south, and Main Street to the west. It is one of Vancouver's oldest neighborhoods, characterized by vintage homes and mature trees. Many homes have detached garages, some of which are accessed from rear service alleys. It contains a diverse selection of architectural styles that blend well together and create a neighborhood with an overall traditional feeling. Several buildings located along McLoughlin Boulevard and 17th Street in the APE are considered eligible for the NRHP, based on architectural merit. Much of the neighborhood's perimeter is surrounded by community commercial activity, most notably along N Main and McLoughlin.

The Hough neighborhood is located west of Main Street, between 15th Street and Fourth Plain Boulevard, with the BNSF tracks as its western boundary. Hough is one of the earliest neighborhoods in Vancouver, with many homes dating back to the early 20th century. Hough has a mix of single-family and multifamily housing units within a perimeter of largely non-residential land uses. Along the eastern boundary (Main Street), the Uptown Village area includes restaurants, specialty stores, and personal services. Along the western boundary there are industrial uses and higher density housing. Along Mill Plain Boulevard, the southern boundary, there are professional offices, and Mill Plain runs along the edge of a campus of government buildings. Along Fourth Plain Boulevard, on the north, there are mostly residential uses. Historic resources in Hough include the Steffan House and Charles Zimmerman House, both located on Columbia. Hough is also home to a local historic district that encompasses approximately 20 blocks north of Mill Plain Boulevard, between Daniels and Markle Streets. Sections of Daniels Street are located in the primary APE.

The Shumway neighborhood is located in the APE west of I-5, between 39th Street and Fourth Plain Boulevard, with a western boundary of Main Street. Shumway is one of the earliest neighborhoods in Vancouver, with some homes dating back to the early 20th century. Shumway predominantly consists of single-family residential development, with higher density multi-family housing located along Main and 39th Streets. The intersections of Main Street with Fourth Plain Boulevard and 39th Street are zoned for commercial uses. The School for Arts and Academics, a non-eligible historic resource, draws students from the surrounding region. There are many historic resources located in Shumway, including the Bailey Dickerson House at 2613 H Street and the Floyd and Minnie Swan House across the street. There are some houses located on Frontage between 33rd and 26th that are considered eligible for the NRHP, but there is not enough historic survey information available for the whole neighborhood at this time to determine if there is a large enough concentration of historic buildings to be considered a residential historic district. It appears that the neighborhood was affected by the construction of I-5 in the 1950s, with the loss of some of the houses east of Frontage at the edge of the highway.

The Rose Village neighborhood (formerly known as the Rosemere neighborhood) is located directly east of I-5, between 39th Street and Fourth Plain Boulevard. Rose Village, which is bordered by Grand Boulevard to the east, is composed almost entirely of single-family residential development. The older houses appear to be built primarily between 1920 and 1950, with new high-density multi-family development and commercial centers located along the perimeter of the neighborhood and along St. Johns Boulevard, which runs through the middle of the neighborhood. Some historic buildings are located in the primary APE between K and P Streets. It appears that the neighborhood was affected by the construction of I-5 in the 1950s, with the loss of some of the houses located west of K Street at the edge of the highway.

The Central Park neighborhood is located immediately east of I-5 between Mill Plain and Fourth Plain Boulevards, with an eastern boundary of Grand Boulevard. Central Park is an early Vancouver neighborhood. Some homes in this neighborhood were originally built for officers and soldiers based at Fort Vancouver. Central Park encompasses a mix of single- and multi-family residential development, and includes the Veterans Administration at its northern edge. The Veterans Administration (VA) complex, now called the Portland VA Medical Center, Vancouver Campus, was originally the US Army Barnes General Hospital. It was built by the US Army Corps of Engineers (USACE) and activated in 1941. It was closed in 1946 and transferred to the Veterans Administration. It is not considered eligible for the NRHP because some of the original buildings have been removed. One historic building from the complex is located in the project area and is considered potentially eligible for the NRHP.

The Vancouver Barrack's Post Cemetery (also known as the Post Military Cemetery and Military Cemetery) is located in Central Park Neighborhood at about Fourth Plain Boulevard and L Street, adjacent to Mother Joseph Catholic Cemetery. Vancouver Barracks Post Cemetery was established in about 1879; Mother Joseph Catholic Cemetery (formerly called St. James Acre) was established in 1882. The Vancouver Barracks Post Cemetery has approximately 1,400 graves, of which 210 are of unknown persons from the mid-1800s that were apparently re-interments from the former Post cemetery. The original post cemetery was relocated when the post needed to expand the buildings on the reserve. Four Medal of Honor recipients are buried at the current Vancouver Barrack's Post Cemetery, and a monument recognizing those four was dedicated in 1991 by General Colin Powell, then the Chairman of the Joint Chiefs of Staff. Only 20-year military veterans and active duty deaths burials are allowed in the cemetery. The cemetery is administered by Ft. Lewis and is considered a military cemetery, not a national cemetery.

Day Walter Hilborn

The APE contains several buildings designed by Day W. Hilborn (1897-1971), arguably Vancouver's most notable architect. Mr. Hilborn practiced from 1927 to the early 1960s, designing over 380 buildings in Vancouver and many others in Washington and Oregon. Hilborn-designed buildings in the project area include the following; those marked with an asterisk have been determined eligible for the NRHP.

- Vancouver First Federal Savings & Loan (1961) at 1205 Broadway*
- Arts building (1928) at 1104 Main Street
- Luepke Florist (1945) at 1300 Washington Street*
- Kiggins Theater (1935-36, 1951) at 1011 Main Street*
- First United Methodist Church (1950) at 401 E 33rd Street*
- Spick-n-Span Drive-in (1949) at 1411 Washington Street*
- Fort Motel (1959-60), now apartments, at 500 E 13th Street*
- Hoffman's Men's Clothes Building (ca. 1945) at 812 Main Street
- Kiggins Bowl (1933) at approximately 45th and Main Street*

3.1.2 Previously Inventoried Washington Historic Built Resources

Numerous historic resources are located within the APE in Washington and have been recorded in the Clark County Heritage Register, the Washington State Heritage Register, and/or the National Register of Historic Places. In addition, both Clark County and the City of Vancouver

maintain historic inventories that contain resources not listed in the Clark County Heritage Register. Inventory efforts previously conducted in the project area include:

- A Washington Heritage Register nomination for residential and educational architecture (1898 – 1945) in the Hough neighborhood (Chamberlain 2002).
- A Clark County historic survey and inventory update (Freed et al. 1999).
- A historic reconnaissance survey for the Vancouver Esther Short neighborhood in 2004; and for the Hough neighborhood in 2006 and 2007.
- A historic inventory of properties for the Vancouver City Center study (Chapman and Wilson 2006).

The cultural resource site records at the DAHP employ the same numbering system for both prehistoric and historic resources. Historic resources usually (but not always) have an H appended at the end of the number, but this added designation does not distinguish between archaeological sites, buildings, and other features that date to the historic period. It must be emphasized that even sites initially recorded simply as historic buildings almost certainly also contain historic archaeological components.

The DAHP, Clark County, and City of Vancouver records contain historic site record forms for previously inventoried historic resources in the primary APE. All of these sites relate to occupation and activity in the historic period, and some of these sites have historic archaeological components. One property, the Fort Vancouver NHS, is a National Historic Landmark with several individual historical (NRHP) properties on it. Seventeen other properties are formally listed in the NRHP, including the I-5 bridges and various historic resources in the Vancouver-Fort Vancouver area. All of the properties in the Washington State Heritage Register are also on the NRHP, and about a dozen additional properties are listed in the Clark County Heritage Register (Exhibit 3-1).

Exhibit 3-1. Listed Historic Resources in the APE, Washington

Historic ID#	Historic Name	Registers ^{a,b,c}	Year Built	Address
32	Lowell M. Hidden House	CCHR (1985) NRHP (1978) WSHR (1978)	1885	100 W 13th Street
35	W. Foster Hidden House	CCHR (1985) NRHP (1978) WSHR (1978)	1913	110 W 13th Street
42	Carnegie Library	CCHR (1985) NRHP (1982)	1909	1511 Main Street
95	Charles Zimmerman House	CCHR (1985)	1906	1812 Columbia Street
918	Gen. Ulysses S. Grant House	CCHR (1985) NRHP (1974)	1849	1101 E Evergreen Boulevard
918	Gen. George C. Marshall House	CCHR (1985) NRHP (1974)	1886	1301 E Evergreen Boulevard
918	Officer's Row Historic District (21 Buildings)	CCHR (1985) NRHP (1974) WSHR (1974)	1849- 1906	611-1616 E Evergreen Boulevard
NA	Charles Wilbur Slocum House	CCHR (1985) NRHP (1973) WSHR (1973)	1867	605 Esther Street
NA	Langsdorf House	CCHR (1985)	1910	1010 Esther Street

Historic ID#	Historic Name	Registers ^{a,b,c}	Year Built	Address
38	Vancouver Telephone Exchange	CCHR (1985) NRHP (1986) WSHR (1986)	1934	112 W 11th Street
227	Bailey-Dickerson House	CCHR (1984)	1905	2613 "H" Street
19	Vancouver National Bank Building	CCHR (1985)	1906	518 Main Street
NA	Charles W. Cushing/John W. and Harriet L. Caples Cushing-Caples House	CCHR (1996)	1888	712 W Evergreen Boulevard
NA	Lloyd DuBois House	CCHR (1996)	1902	902 Esther Street
85	Alfred and Estelle-Ella Chumasero and Otis Hinkley "Bud" Smith House	CCHR (1997) WSHR (1998) NRHP (1998)	1903	310 W 11th Street
228	Floyd and Minnie Swan House	CCHR (2002)	1906	714 E 26th Street
NA	Joseph P. and Cora Steffan House	CCHR (2004)	1909	2000 Columbia Street
84	Kettenring House	CCHR (2005)	1908	314 W 11th Street
75	Greeley Building	CCHR (2005)	1920	1012 Washington Street
70	Columbian Building	CCHR (2005)	1928	110 E Evergreen Boulevard
333	Peter J. Flynn House	CCHR (2007)	1926	114 W 20th Street
150	House of Providence (Academy)	NRHP (1978) WSHR (1978)	1873	400 E Evergreen Boulevard
30	Elk's Building	NRHP (1983) WSHR (1983)	1911	916 Main Street
21	Evergreen Hotel	NRHP (1979) WSHR (1979)	1928	500 Main Street
NA	Fort Vancouver	National Landmark (2004)	1824	612 E Reserve Street
381	Vancouver-Portland Bridge	NRHP (1982) WSHR (1981)	1917	Connecting Vancouver, WA and Portland, OR
83	Main Post Office	NRHP (1991) WSHR (1991)	1917	1211 Daniels Street
74	St James Catholic Church	NRHP-eligible (1986)	1885	204 W 12th Street
41	Mayor Kiggins House	NRHP (1995) WSHR (1995)	1907	2404 H Street
368, 369, 918, 109	Vancouver National Historic Reserve, Historic District (includes Officers Row, Pearson Airfield, the Barracks)	NRHP (2007) WSHR (2007)	NA	Within VNHR
520	Lucky Lager Warehouse	CCHR (2009)	1920	215 W 4th Street

Notes:

- a CCHR: Clark County Heritage Register.
- b NRHP: National Register of Historic Places.
- c WSHR: Washington State Heritage Register.

3.1.2.1 Previously Non-inventoried Washington Historic Built Resources

The APE includes approximately 871 historic resources built before 1967 that were not previously inventoried or entered into the DAHP database. CRC cultural staff surveyed the primary APE beginning in June 2007 and determined there to be 196 historic resources potentially eligible for the NRHP or already NRHP-listed in the APE. Following the review from the Oregon SHPO and Washington DAHP, a total of 172 properties were determined eligible, in addition to the 24 already listed. One property has since been listed (the Lucky Lager Warehouse.

However, though the Clark County Historic Preservation Commission has listed the structure, it has been found *not eligible* by professional architectural historians, and DAHP has concurred with this finding. Areas of concentrated historic resources are located in the downtown Vancouver commercial core, Uptown Village, and residential buildings adjacent to the project in Esther Short, Arnada, Hough, Carter Park, Rose Village, and Shumway neighborhoods. All surveyed historic resources (eligible, listed, and non-eligible) were entered into the DAHP Historic Property Inventory database. Refer to Appendix A for a list and map of the eligible and listed properties.

3.1.3 Historic Resources in Oregon

The project area in Oregon is situated between the Columbia River and Columbia Slough and includes fairly recent development. It consists of relatively low ground that corresponds to the current flood plain of the Columbia River. Portland was incorporated in 1851, spurred by the growth of the lumber industry. The Northern Pacific Railroad arrived in Portland in 1883, leading to greater growth and development. By 1887 Portland had a population of 7,000. The North Bank Railroad Bridge across the Columbia River was completed in 1907, opening up the area around the Columbia Slough, and development began.

As Portland continued to grow, landowners along the Columbia River and the slough began to form Drainage Districts in order to control flooding and to find new land for agricultural development. Between 1916 and 1918, the Sandy Drainage Improvement Company (SDIC) constructed the first levee along the Columbia River. This was soon followed by the formation of other drainage districts. The Oregon Slough Levee was constructed along the northern edge of the slough between 1918 and 1920 to protect inland acreage from flooding. The area along the slough began to attract further industrial development. Swift and Company and other meatpacking companies and stockyards were located there, and lumber and wood products industries moved in from the 1910s through 1940s. World War II brought wartime industry to the north Portland area with a large influx of workers and the creation of the town of Vanport. The town was constructed in 1943 to house the workers at the wartime shipyards in Portland and Vancouver. Over time, Vanport had been home to over 100,000 people, reaching a one-time population of 40,000, making it Oregon's second-largest city at the time and the largest public housing project in the nation. In its heyday it had a movie theater, five schools, a library, a police station and even a college. After the war, Vanport lost more than half of its population, dropping to 18,500, as many war time workers left the area. But, there was also an influx of returning World War II veterans.

At 4:05 p.m. on May 30, 1948, a 200-foot section of the dike holding back the Columbia River collapsed, flooding the town and killing fifteen people. The city was underwater by nightfall, leaving its inhabitants homeless. The land is now occupied by West Delta Park, Heron Lakes Golf Course and Portland International Raceway, and Vanport Wetlands.

The majority of the North Portland portion of the APE is composed of industrial, park, and commercial properties, although Hayden Island has single-family, multi-family, and houseboat housing facilities in addition to retail, commercial, and hotel development.

The 1917 (northbound) Columbia River bridge structure is listed in the NRHP and is considered to have national and exceptional significance. The 1958 (southbound) bridge does not possess national or exceptional historic significance, was not excluded from the FHWA Section 106 Interstate Highway System Exemption in 2006, and is not considered eligible for the NRHP. This evaluation was done at the national level in 2005 by the Advisory Council on Historic Preservation, which adopted a "historic preservation exemption" under Section 106 of the NHPA that effectively excludes the vast majority of the 46,700-mile Dwight D Eisenhower System of Interstate and Defense Highways (Interstate System) from review as historic property under

Section 106. Only distinct elements of the system that meet the NRHP criteria for national or exceptional significance will continue to be treated as historic properties. Similarly, Section 6007 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) amended existing Section 4(f) legislation to exempt the bulk of the Interstate Highway System from consideration as a historic property, with the exception of Interstate elements having national or exception historic significance.

Both of the I-5 bridge structures are of steel through-truss construction with movable spans. ODOT owns and administers the bridges' operations, the costs of which are split between the two states.

The 1917 bridge, the Pier 99 building, and the Columbia Slough Levee are considered NRHP-eligible.

3.1.3.1 Previously Inventoried Oregon Historic Built Resources

Very few inventoried historic resources are located within the APE in Oregon. Only three resources have been identified in either the Portland Historic Landmarks or the NRHP. They include the NRHP-listed Carousel, located at Jantzen Beach, and Waddles (now Hooters), which is no longer considered eligible as landmark property. The third resource is the Steel Bridge in Portland.

Oregon Slough Levee

One resource, the Oregon Slough and Levee System, was determined eligible by the SHPO in July 22, 2005, as contributing elements of the Columbia Slough Drainage Districts Historic District (CSDDHD). The CSDDHD is a group of four geographically contiguous Columbia Slough drainage districts located on the Columbia River floodplain between the Willamette River and the Sandy River, occupying approximately 10,000 acres. The period of significance begins in 1916 with the construction of the first SDIC levee, and ends in 1960 with the completion of projects related to the Flood Act of 1950, which resulted from the 1948 Vanport flood.

The Oregon Slough Levee was constructed along the North Portland Harbor's southern bank between 1918 and 1920. It extends east from the Union Pacific Railroad (UPRR) to its connection with the Peninsula Drainage Canal Cross Levee. Levees are considered historic contributing elements to the CSDDHD. Although they have undergone alterations since their initial construction, they retain their essential physical characteristics and alignment integrity. They continue to perform their historic function and are maintained in good condition in order to fulfill that function (O'Brien 2004).

Pacific International (PI) Livestock Exposition (1918-1965) Building

One other historic resource, located on the west side of I-5 at 2060 N. Marine Drive is the Pacific International (PI) Livestock Exposition (1918-1965) Building. It is in the primary APE and was inventoried but not determined eligible for the National Register of Historic Places. The Livestock Exposition was started in 1910 as a beef cattle show to promote the business of the North Portland Stockyards. The first buildings, erected in 1921 through 1922, were burned but rebuilt in 1925.

In 1942 the PI became the North Portland Assembly Center where Portland-area Japanese Americans, both Issei, or first generation, and Nisei, or second generation, were brought and detained after President Franklin D. Roosevelt issued Executive Order 9066 (signed February 19, 1942) giving the US Army the right to exclude any person from designated military zones in time

of national peril in order to preserve national safety. The Portland Assembly Center was one of 15 such holding facilities (Oregon History Project, Oregon Historical Society). In May of that year, approximately 3,700 Japanese were forced to leave their homes. They were given only a short period of time to gather a few personal belongings and were brought to the Detention Center. For 5 month individuals and families were held in the building in 200 square-foot livestock stalls partitioned into tiny apartments. Each family was assigned a room with a common toilet and provided with open cafeterias and communal showers until they were be relocated by train to one of the Japanese internment camps. Most internees from Portland were sent to the Minidoka Relocation Center in Idaho. Some internees went to Tule Lake in California, and a portion relocated to the internment camp in Heart Mountain, Wyoming. Of the 110,000 Japanese Americans incarcerated under this law, over 4,000 came from Oregon.

The Expo Center site was also used as the Multnomah County Fair and served as the site of the Oregon Centennial celebration in 1959-60. The historic PI Building is now part of the Portland Expo Center. It is part of a larger building space referred to as Hall A, with two wings (Hall B on the west, Hall C on the south) and an entry area/lobby on the east. The entrance is on the parking lot side on the east, with the original entry used as an exit-only area. It is covered with metal siding, and most original windows have been covered up or replaced with aluminum frame windows. A plaque commemorating the site, dedicated in 1992 by Multnomah County and the Portland Chapter of the Japanese American Citizens League on the 50th anniversary of the signing of Executive Order 9066, hangs on the wall in the lobby of the building. It says:

The Portland Assembly Center

During World War II all persons of Japanese ancestry were forcibly evacuated from the West Coast. On the site 3,676 Japanese Americans from Northwest Oregon and the Yakima Valley in Washington were detained from May 2 to September 10, 1942. From this center evacuees were sent to internment camps in Idaho, Wyoming, and California. They were incarcerated for over three years without ever being accused or convicted of any crime.

May the principles inherent in the US Constitution and The Bill of Rights be kept alive in the hearts of all Americans so that similar injustices will never be repeated.

The internment site is further commemorated at the Tri-County Metropolitan Transportation District (TriMet) MAX Yellow Line's Expo Center Stop # 9443 as part of TriMet's Public Art Program. Artist Valerie Otani adopted the theme of Japanese relocation during World War II at the site of the 1942 Portland Assembly Center, using traditional Japanese timber gates strung with metal "internee ID tags" to mark station entrances. Vintage news articles are etched in steel and wrapped around the gate legs.

I-5 Bridges

As mentioned above, the I-5 (now northbound) span was completed in 1917, connecting Vancouver and Portland. It was built by Multnomah and Clark Counties, and was a toll bridge until it was purchased by Oregon and Washington in 1929. At the time of construction it was considered an engineering feat as one of the largest bridges in the world. It helped to stimulate the economy of the region and assisted in the growth of interstate commerce. Interstate 5 was completed through Vancouver in 1954, using access on the 1917 bridge to Portland (listed in the NRHP July 16, 1982). A parallel bridge was built in 1958 to accommodate increased traffic flow on the new highway, and southbound traffic was shifted to this new bridge.

Steel Bridge

The Steel Bridge is NRHP-eligible. It is a through-truss, double-lift bridge across the Willamette River in Portland, Oregon. Its lower deck carries railroad and bicycle/pedestrian traffic, while the upper deck carries road traffic (on the Pacific Highway West No. 1W, former Oregon Route 99W) and light rail (MAX), making the bridge one of the most multimodal in the world. It is the only double-deck bridge with independent lifts in the world, and the second oldest vertical lift bridge in North America, after the nearby Hawthorne Bridge.

The bridge was built by Union Pacific Railroad and the Oregon Railway and Navigation Company, and opened in July 1912 to rail traffic and on August 9, 1912, to automobiles. Between 1984 and 1986 the bridge underwent a \$10 million rehabilitation, including construction of MAX rails. In 2001, an 8-foot wide cantilevered walkway was installed on the southern side of the bridge's lower deck as part of the Eastbank Esplanade construction, making a total of three publicly accessible walkways, including two narrow sidewalks on the upper deck.

During the Summer of 1999, the Historic American Engineering Record (HAER), and the Oregon Department of Transportation worked on a collaborative project to document the 11 Willamette River bridges in Portland. The historic narrative includes the following excerpt: "The Steel Bridge captures the engineering genius of John Lyle Harrington, who created the mechanisms that translated J. A. L. Waddell's pioneering vertical lift bridges into solid, reliable structures. With two independent, moveable decks, it is unique and, simultaneously, an elegant culmination of Waddell & Harrington's design innovations. It survives in part because Harrington refined both small components, such as the equalizers that distribute weight among the ropes and the guides that keep the spans in alignment as they move, and large features, such as the telescoping vertical member and the system of ropes, sheaves, and counterweights. Decades after its completion, engineering textbooks consistently portrayed it as exemplary."

3.1.3.2 Previously Non-inventoried Oregon Historic Built Resources

The project area includes some historic resources built before 1967 that had not been previously inventoried. Many of the buildings in the Delta Park area were constructed after 1955, or have been altered and do not have integrity of design.

Pier 99, originally the Totem Pole Marina, at 1441 N Marine Drive is considered NRHP-eligible under Criterion C. It is a circa-1960 commercial building, a good example of a mid-20th century modern commercial building designed and constructed in the "Googie" style. It was designed by Oregon architect John Storrs (1920 to 2003), whose innovative designs were a significant contribution to the Northwest Regional Style. Storrs specialized in wooden buildings, calling wood "an understandable, romantic material" (University of Oregon Libraries 2007). The titular "Totem Pole" most likely refers to the building's essential structural elements: the centered 10-inch square pole, with 6-inch square members at the buildings corners and 8-inch square members at the sides. The most significant feature is the hyperbolic folded plate roof and glass walls.

Pier 99 has been used as a boat showroom/business building since its construction. The building appears to have some structural challenges due to its age and the complex character of the roof. The building is located along the Columbia Slough Levee on the south side of Hayden Island.

One of Storrs most significant buildings was the Forestry Lumber Pavilion at the Oregon Centennial Exposition (1959, not extant) that also featured a hyperbolic parabolic roof (Vaughn 1974). The site of the Expo Center was across I-5 (west) from the Pier 99 building. Storrs worked with engineer James G. Pierson for both the Pier 99 and the Forestry buildings.

Some of Storrs' other important buildings include the Portland Garden Club (1955), the Peter Kerr house in Portland (1959), Salishan Lodge, Gleneden (1965), and the Western Forestry Center, Portland (1971).

Ruby Junction Maintenance Facility

The LPA will extend the Interstate MAX light rail line to Vancouver. The extension will require a fleet of 5 to 16 additional Type 5 light rail vehicles to be maintained at the TriMet Ruby Junction Operations and Maintenance Facility on NW Eleven Mile Avenue in Gresham. In addition the Portland-Milwaukie Light Rail Project would require an additional 14 to 23 Type 5 light rail vehicles for that proposed project. The expansion of the Ruby Junction Operations and Maintenance Facility would require enlarging the existing facility site, including new structures and storage tracks. The proposed Ruby Junction expansion would require the acquisition of 15 tax lots and closing NW Eleven Mile Avenue between 2227 and 1709 NW Eleven Mile Avenue.

A Section 106 survey of the project area was conducted by a qualified cultural resources specialist consultant in October 2009. None of the buildings in the project area met the criteria for NRHP eligibility because they are not old enough or have been altered and have lost integrity of materials, design, or setting.

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4. Long-term Direct Effects

4.1 No-Build Alternative

The No-Build Alternative could have effects to historic properties caused by other projects or actions (e.g., a major seismic event, or redevelopment and transportation projects). But, because those effects are not known, no specific or known long-term direct or indirect effects can be identified at this time. It is known, however, that the No-Build Alternative would generally result in substantial traffic congestion along the I-5 corridor. Without seismic upgrades to the bridges, especially the northbound, 1917 bridge, it is subject to collapse in a major seismic event.

4.1.1 Direct, Primary Effects of the LPA

Exhibit 1-3 provides a summary of information regarding the effects to historic properties. Based on direct physical impacts, the LPA would affect 19 historic properties. Of these, three have been determined to be adverse effects. The LPA would require removal of the NRHP-listed 1917 I-5 bridge and the displacement of the Pier 99 building, which are adverse effects to these structures. Numerous impacts to the Vancouver National Historic Reserve (and associated District) would also constitute an adverse effect. For each potentially affected property, there is a determination of whether the LPA causes an adverse effect, no adverse effect, or no effect. When the only change is a minimal modification of vehicular access, such as limiting it to right-in-right-out movements only, there is usually no effect to the historic resource. However, if there is both a change in access, and any permanent or temporary property acquisition, the potential for impacts increases. For properties that will have a temporary construction easement and an access change, the determination often changes from no effect to the historic resource to no *adverse* effect/not adverse.

4.1.2 Oregon Mainland

This section provides a description of the long-term direct effects to NRHP-eligible and -listed historic resources resulting from the LPA on mainland Oregon. These effects are summarized in Exhibit 4-1. Please also refer to the Section 106 Finding of Effect documentation in Appendix C.

Pier 99 Building (1415 Marine Drive, OR ID 1, parcel ID R951340820)

The Pier 99 Building would be displaced due to the construction of a collector/distributor ramp on I-5 between Marine Drive and Hayden Island. This would be considered an adverse effect. Although the historic building would be displaced, associated but not NRHP-eligible structures on the east side of the parcel would remain. Approximately 54,540 square feet of the property would need to be acquired permanently for I-5 right-of-way; and a subsurface easement would be used to conduct soil stabilization for the ramp structure.



Oregon Slough Levee (North Portland Harbor, OR ID 2)

The Oregon Slough Levee is part of an extensive, historic system of engineered improvements to the area’s drainage. A small portion of the levee, approximately 330 linear feet extending east of I-5, would need to be demolished and rebuilt in order to accommodate the ground improvements needed to stabilize soils below the I-5 ramps and bridges. Construction crews would either remove the levee prior to conducting the stabilization and rebuild it, or perform the ground improvements through the levee and reconstruct it afterward. Similar, minor alterations would be completed for the North Denver Avenue Cross Levee and Union Avenue/Martin Luther King Fill/Cross Levee.



Although the project has changed since the first Section 106 Level of Effect finding form was submitted, the conclusion that the project would have an effect on the National Register-eligible Columbia Slough Drainage Districts Historic District and the effect is “not adverse” remains unchanged. Although localized alterations to contributing elements would occur, the integrity of each of the levees and of the overall system would be maintained.

Steel Bridge

To accommodate additional light rail trains, the project would retrofit the existing transit guideway rails in the road bed of the Steel Bridge to increase the allowed light rail speed over the bridge. The changes would not alter character-defining features of the bridge or introduce new visual components. The changes are very modest and will only be made to elements of the light rail infrastructure not original to the bridge design. There will be no adverse effect to this historic resource.

4.1.3 Ruby Junction Light Rail Maintenance Facility

Major expansion of the light rail system in Vancouver requires greater maintenance facility capacity. TriMet’s Ruby Junction Operations and Maintenance Facility, at NW Eleven Mile Avenue in Gresham, would be expanded. None of the buildings in the project area met the criterion for NRHP eligibility because they are not old enough or have been altered and have lost integrity of materials, design, or setting.

Exhibit 4-1. Long-term Direct Effects – Oregon Mainland

OR ID	Resource Name and Parcel Info	Direct Effects			Findings of Effect
		Permanent Acquisition	Permanent Easement	Access/ Parking	
OR 1	Pier 99 1415 Marine Drive R951340820	Displacement 54,540 sq.ft.	NA	NA, Resource Displaced	Adverse
OR 2	Oregon Slough Levee	Displacement 330 l.f.	NA	No impact	No adverse effect
	Steel Bridge	Modest modification of transit rail			No adverse effect

4.1.4 Columbia River (including Hayden Island)

This section provides a description of the long-term direct effects to NRHP-eligible and -listed historic resources on Hayden Island and to the I-5 bridges. These effects are summarized in Exhibit 4-2.

No historic resources on Hayden Island will be impacted. The Jantzen Beach Carousel (located within the Super Center Mall) is a historic resource which has been proposed for removal, concurrent with draft redevelopment plans. Regardless of the owner's plans to potentially relocate the carousel, the CRC project will not affect the carousel. The sign for the former Waddle's Diner was previously considered eligible for the NRHP. Since the conversion to a Hooters Restaurant, the sign has undergone changes that have altered those characteristics that qualified it for NRHP eligibility.

The River subarea, of course, includes the I-5 bridges. The LPA requires the removal of the NRHP-listed bridge (DAHP ID 381).

Exhibit 4-2. Long-term Direct Effects – Columbia River

DAHP ID	Resource Name	Direct Effects				Findings of Effect
		Permanent Acquisition	Permanent Easement	Access/ Parking	Noise/ Vibration	
381	I-5 Bridge (NB)	Displacement	NA	NA, Resource Displaced		Adverse

4.1.5 Downtown Vancouver

This section provides a description of the long-term direct effects to NRHP-eligible and -listed historic resources resulting from the LPA in Downtown Vancouver, extending from the Columbia River north to, but not including, McLoughlin Boulevard. These effects are summarized in Exhibit 4-3.

Vancouver National Historic Reserve (VNHR)

The VNHR Historic District consists of the westernmost 252 acres of the larger Vancouver National Historic Reserve. The VNHR Historic District was listed on the NRHP in 2007 and encompasses the many historic resources found in the Reserve. Cultural and historic resources found inside the Historic District include the Fort Vancouver National Historic Site, Officers Row, the Vancouver Barracks (including Barracks Post Hospital), and Pearson Airfield.

Within the VNHR Historic District as a whole, the project would permanently acquire 72,787 square feet of right-of-way (1.67 acres) and 7,176 square feet for permanent easements. These impacts are spread along a strip of land on the southwest and western boundary of the District. These areas were within the active HBC "Kanaka" Village area, but are now bordering the outer edge of the Park Service property. The acquired land will also include property that is currently used by the US Army. Within the Village area a distinctive and historic tree allée curves along the edge of what had been a historic roadway system serving the Village and later Army and Civilian Conservation Corp uses. The southern terminus of the allée will be impacted by the property acquisition, and it is likely that the southernmost trees will be removed. Design refinements will be conducted with the intent of avoiding or minimizing these trees. Regardless, the VNHR Historic District as a whole would be adversely impacted by the LPA.

A visual impact contributing to the determination of an adverse effect would result from the ramp structures adjacent to the Village. The reconstructed Village is a key component of the Reserve and is increasingly programmed for visitor experience. With the LPA, the SR 14 westbound ramp

which connects to the I-5 northbound facility will be roughly 20 feet higher than the existing ramp. The City Center exit loop currently is below- and at-grade, underneath the aforementioned ramp, and largely not visible from the Village. With the LPA, this loop ramp will move from underneath to overtop the SR 14 to I-5 ramp, greatly increasing its prominence in the area. The loop ramp will be roughly 20 feet above the SR 14 to I-5 ramp.

In the text below, more detail is provided on effects to historic resources within the VNHR Historic District. These resources include the Barracks Hospital (DAHP ID 368), Officers Row (DAHP ID 918), and Heritage Apple Tree Park (DAHP ID 109).

The Barracks Hospital (610 E 5th Street, Parcel ID 38279906, DAHP ID 368)

The project would include permanent and temporary acquisitions along the western property edge of the Barracks Post Hospital. A temporary easement of approximately 4,000 square feet would be required along the west side of the property. Permanent acquisitions of approximately 13,000 square feet in the same area along the I-5 corridor would also be required to construct the retaining wall. This acquisition would extend to within 18 feet of the southwest corner of the Post Hospital and to within 3 feet of the northwest corner. The building will not be displaced.



While the building would not be directly displaced, the setting associated with the building would be adversely affected by placing highway facilities and sound walls much closer to the building than they are currently. These modifications would constitute an adverse effect to the VNHR Historic District's cultural landscape.

Officers Row (654 Officers Row, Parcel ID 38279941, DAHP ID 918)

The project would not require any permanent acquisitions for Officers Row. No buildings would be displaced. There would be no effect to the historic resource.



The Heritage Apple Tree Park (Parcel ID 38279935, DAHP ID 109)

The project would require a 209-square-foot permanent airspace easement along the northeast portion of Old Apple Tree Park that would impact landscaping at the park. A shading analysis was conducted to assess the potential for increasing the shading of the tree, and thereby causing indirect effects. The results indicate that there would be no such shading impacts associated with the LPA.



Normandy Apartments (318 E 7th Street, Parcel ID 38820000, DAHP 149)

The Normandy Apartments are located immediately adjacent to I-5, north of the I-5/SR 14 interchange. A narrow strip of property along the eastern edge of the parcel, totaling 481 square feet, would need to be permanently acquired for the construction of a retaining wall along the Interstate. Some landscaping would be impacted by this acquisition. No structures on the parcel would be displaced. There would be no adverse impacts associated with the acquisition of the narrow strip of property.



Smith Tower (515 Washington Street, Parcel ID 47840000, DAHP ID 10)

The multi-family senior housing complex, Smith Tower, is located in lower downtown and is adjacent to the light rail alignment. Smith Tower has two accesses on Washington Street that would be closed for vehicles following construction. The building occupants will no longer be able to access the underground parking. While the use of the underground parking will be discontinued, the physical design of the structure will go unaltered. There would be no adverse effect to the historic resource.



Schofield Building (114 W 6th Street, Parcel ID 47940000, DAHP ID 11)

Access from Washington to the parking lot used by the Schofield Building would be changed to right-in/right-out only for vehicles following construction of the light rail alignment along Washington. There would be no effect to the historic resource.



Commercial (111 W 7th Street, Parcel ID 47930000, DAHP ID 13)

Access from Washington to the parking lot used by the adjacent historic commercial building would be changed to right-in/right-out only for vehicles following construction of the light rail alignment along Washington. There would be no effect to the historic resource.



W Foster Hidden House (110 W 13th Street, Parcel ID 47101000, DAHP ID 35)

Access from Washington to garages used by historic W Foster Hidden House would change to right-in/right-out only for vehicles following construction of the light rail alignment along Washington. There would be no adverse effect to the historic resource.



Vancouver Telephone Exchange (112 W 11th Street, Parcel ID 51830000, DAHP ID 38)

Access from Washington to a driveway used by the occupants of the historic Vancouver Telephone Exchange building would be changed to right-in/right-out only for vehicles following construction of the light rail alignment. There would be no adverse effect to the historic resource.



Luepke Florist (1300 Washington Street, Parcel ID 47281000, DAHP ID 73)

Access from Washington Street to a parking lot adjacent to and used by Luepke Florist would be changed to right-in/right-out for vehicles following construction of the light rail alignment. There would be no effect to the historic resource.



Commercial (1500 Broadway, Parcel ID 40290000, DAHP 113)

Following construction of the light rail alignment on Broadway Street, access from Broadway Street to the building would be eliminated for vehicles. The building has a large garage bay door which has been used to provide access to the interior of the building. The door itself and the building would be unchanged as a result of this modification. It would still be possible to open the door, but vehicular access will no longer be permitted. There would be no adverse effect to this historic resource.



City Hall (210 E 13th Street / Parcel ID 39630000, DAHP ID 1043)

Access from Broadway Street to a parking lot used by the historic Vancouver City Hall Building would be changed to right-in/right-out only for vehicles following construction of the light rail alignment on Broadway Street. There would be no adverse effect to this historic resource.



Washington Mutual/Chase Bank (1205 Broadway Street, Parcel ID 39490000, DAHP ID 1045)

Access from Broadway Street to a parking lot used by the historic Washington Mutual Bank would be changed to right-in/right-out only for vehicles following construction of the light rail alignment on Broadway Street. There would be no adverse effect to this historic resource.



Exhibit 4-3. Long-term Direct Effects – Downtown Vancouver

DAHP ID	Resource Name and Parcel Info	Direct Effects			Noise/ Vibration	Findings of Effect
		Permanent Acquisition	Permanent Easement	Access/ Parking		
368	Vancouver National Historic Reserve 610 E 5th Street 38279906A	72,787 sq.ft. (from entire VNHR)	7,176 sq.ft.	Loss of Anderson Road	Highway noise effects	Adverse
368	Post/Barracks Hospital	12,914 sq.ft.	NA	Loss of Anderson Road	NA	Adverse
	Village Area	30,492 sq.ft.	4,356 sq.ft.	NA	Highway noise effects	Adverse
918	Officers Row	NA	NA	NA	NA	Adverse
109	Apple Tree Park SW Columbia Way 38279935	NA	209 sq.ft. for airspace	NA	NA	No adverse effect
10	Smith Tower 515 Washington 47840000	NA	NA	Access on Washington closed	NA	No adverse effect

DAHP ID	Resource Name and Parcel Info	Direct Effects			Noise/ Vibration	Findings of Effect
		Permanent Acquisition	Permanent Easement	Access/ Parking		
11	Schofield Building 114 W 6th Street 47940000	NA	NA	Adjacent parking changed to right-in/right-out only	NA	No Effect
13	Vacant Commercial 111 W 7th Street 47930000	NA	NA	Adjacent parking changed to right-in/right-out only	NA	No Effect
35	W Foster Hidden House 110 W 13th Street 47101000	NA	NA	Access changed to right-in/right-out only	NA	No adverse effect
38	Vancouver Telephone Exchange 112 W 11th Street 51830000	NA	NA	Access changed to right-in/right-out only	NA	No adverse effect
73	Luepke Florist 1300 Washington 46920000	NA	NA	Adjacent parking changed to right-in/right-out only	NA	No Effect
113	Commercial 1500 Broadway 040290000	NA	NA	Access lost and loss of use of bay door	NA	No adverse effect
149	Normandy Apartments 318 E 7th Street 38820000	481 sq.ft.	NA	NA	Modest highway noise effects above second floor	No adverse effect
1045	Washington Mutual/ Chase Bank 1205 Broadway Street 39490000	NA	NA	Access changed to right-in/right-out only	NA	No adverse effect
1043	City Hall Building 210 E 13th Street 39630000	NA	NA	Access changed to right-in/right-out only	NA	No adverse effect

4.1.6 Upper Vancouver

This section provides a description of the long-term direct effects to NRHP-eligible and -listed historic resources in Upper Vancouver caused by the LPA. Exhibit 4-4 provides a summary of these long-term direct effects. The 17th Street alignment has no permanent right-of-way impacts associated with it. The noise and temporary effects to the historic properties on 17th Street are addressed later, in the respective sections. Please see the following sections for noise and other impacts.

Kiggins Bowl (Behind Discovery Middle School, Parcel ID 012454005, DAHP ID 993)

One of the two access points to the Kiggins Bowl Sports Fields and Stadium would be impacted by the construction of a retaining wall along I-5, although the fields and stadium themselves would not be physically impacted. A total of 1675 square feet of property near the southern access located along the east side of Discovery Middle School would be acquired for the placement of the retaining wall. This permanent acquisition would displace some landscaping, trees, and parking used by the school. A permanent subsurface easement, totally approximately 11,814 square feet, would extend



from the wall and under the access road for the installation of long ties that will anchor the wall into the soil. This subsurface easement would not permanently affect the aboveground use of this area in any way, and would only prevent excavation below a certain depth, which will be determined following the final design of the wall. Use of this road to access the stadium and sports fields, as well as the Discovery Trail, is not expected to be permanently affected by installing a retaining wall at this location. There would be no adverse impacts.

3110 K Street (Parcel ID 13460000, DAHP ID 59)

A permanent easement would be acquired for the residence at 3110 K Street. This would be required in order to install long rods underneath the house to anchor the proposed retaining walls along I-5. There would be no adverse effect to this historic resource.



3000 K Street (Parcel ID 13725000, DAHP ID 61)

A total of only 148 square feet of property would be acquired from 3000 K Street. A permanent easement would also be acquired. This would be required in order to install long rods underneath the house to anchor the proposed retaining walls along I-5. There would be no adverse effect to this historic resource.



903 E 31st Street (Parcel ID 13670000, DAHP ID 62)

A permanent easement would be acquired for the residence at 903 E 31st Street. This would be required in order to install long rods underneath the house to anchor the proposed retaining walls along I-5. There would be no adverse effect to this historic resource.



Exhibit 4-4. Long-term Direct Effects – Upper Vancouver

DAHP ID	Resource Name and Parcel Info	Direct Effects				Findings of Effect
		Permanent Acquisition	Permanent Easement	Access/Parking	Noise/Vibration	
48	502 E McLoughlin Boulevard 4163000	502 sq.ft.	NA	NA	NA	No adverse effect
116	307 E 17th Street 40890000	NA	NA	NA	Requires residential sound insulation	No adverse effect
129	404-406 E 17th Street 41255000	NA	NA	NA	Requires residential sound insulation	No adverse effect
133	604 E 17th Street 41380000	NA	NA	NA	Requires residential sound insulation	No adverse effect
993	Kiggins Bowl 800 E 40th Street 12454005	1,675 sq.ft.	11,814 sq.ft.	One access modified	NA	No adverse effect
59	13460000 3110 K Street		1,689 sq.ft.	NA	NA	No adverse effect
61	13725000 3000 K Street	148 sq.ft.	2,156 sq.ft.	NA	NA	No adverse effect
62	13670000 903 E 31st Street		2,983 sq.ft.	NA	NA	No adverse effect

4.2 Direct Secondary Effects of the LPA

Direct secondary effects are project activities or plans that could change the qualities for which historic resources are listed or considered eligible for the NRHP but are not direct effects (right-of-way acquisitions). For historic resources direct, secondary effects may include visual, air quality, noise, or traffic effects that could cause changes to the historic setting or use of the historic resources. A review of the Economic, Land Use, Visual, Air Quality, Traffic, and Noise Technical Reports prepared for the DEIS helped to identify direct secondary and indirect impacts.

Indirect effects are generally caused by the project later in time or farther removed in distance from the APE, but are reasonably foreseeable based on factors in addition to direct right-of-way acquisition. The Indirect effects are discussed in the Indirect Effects Technical Report.

4.2.1 Air Quality

The project effects from air quality do not appear to change the characteristics for which the historic resources are listed or considered eligible for the NRHP (see the Air Quality Technical Report).

4.2.2 Impacts to Property Access and On-street Parking

Loss of on-street parking because of traffic changes and the addition of light rail station platforms could result in a direct effect. The effect of the loss in parking is lessened with the construction of a high-capacity transit system and multi-use parking facilities.

Loss of on-street parking would result in the loss of convenience parking in front of buildings (especially retail and services uses) and could reduce the sense of protection that parked cars give pedestrians on sidewalks. These factors could be considered public infrastructural aspects of location and design important to maintaining a historic property's use or the relationships between physical features within the property's setting that contribute to its historic significance.

The project team completed an assessment of current parking spaces, their utilization, and the likely impacts of the light rail guideways and stations. Based on the on-street parking inventory, the assessment of parking utilization patterns, and the evaluation of parking impacts associated with the proposed project, the resulting conclusions were reached for the downtown Vancouver study area:

- The City of Vancouver has 1,995 on-street parking spaces in the downtown study area (including both the area studied for the CRC project and from an earlier study of core area parking).
- The common peak hour of vehicle occupancy is 12 p.m. to 1 p.m. for all on-street parking in the study area.
- The peak hour occupancy rate of the study area is 43 percent for the portion of downtown studied for the CRC project. For the portion of downtown previously studied (the core area), peak occupancy is 46 percent.
- Occupancy rates are much lower than the 85 percent threshold which is typically used in parking analysis to represent full occupancy.

With the loss of on-street parking spaces along Washington Street under the LPA, the aggregate demand for parking on this street is expected to exceed supply by approximately 7 percent. When parking space availability within a one to two block corridor along the light rail transit alignment is considered, existing demand would consume only 59 percent of available supply. Along Broadway Street, five blocks immediately adjacent to the project are expected to see parking displacement that can readily be accommodated within a one block walking distance from the corridor. In the aggregate, existing parking demand would consume only 73 percent of available parking supply, dropping to 51 percent if available parking within a one to two block radius is considered. Based on these findings, the current supply of parking is sufficient to meet the demand during peak parking hours along the proposed light rail transit alignment.

4.2.3 Noise and Vibration Impacts

Noise impacts were modeled for all the properties adjacent to the project and within the project APE. Noise impact standards are much higher for commercial than for residential uses; no impacts were identified at commercial properties. Noise impact assessments were focused on residential structures or other properties with noise-sensitive uses (schools, hospitals, parks, etc.).

Without application of noise attenuation measures, noise impacts resulting from the No-Build Alternative and the LPA would occur throughout the project corridor. With mitigation, only a handful of properties would continue to be affected by increased highway noise levels. Slightly more properties would be affected by transit related noise. Highway noise impacts are mitigated with the construction of new sound walls. Mitigation for light rail noise impacts include sound barriers, track lubrication at curves, and other features designed into the infrastructure itself. Along 17th Street, residential sound insulation would also be part of the project mitigation.

Building retrofits are considered on a case-by-case basis and determined during the final design stage. Some possible mitigation measures to reduce interior noise levels are described below. Given that these measures would be taken on NRHP-eligible houses, the rehabilitations will need to be reviewed for consistency with the Secretary of the Interior Standards for such. For example, storm windows would have to be compatible with the original window designs and not introduce new, architectural, impacts. Other possible approaches are described below. A combination of these approaches will be used in accordance with the needs of individual structures.

In buildings where windows are used for ventilation, noise effects may occur. Closing the windows is often sufficient to reduce interior noise levels to less than the standard thresholds. To re-establish the ventilation provided by the windows, ventilation systems are needed. A forced air ventilation system can re-establish proper air circulation while providing effective noise mitigation. Air conditioning systems may be used in place of ventilation systems when they can be installed at the same or lower cost. Some air conditioners, however, generate their own noise levels and may negate the traffic noise reductions.

The installation of storm windows is often coupled with a ventilation system to provide increased noise reduction. Storm windows also reduce winter heat losses. The money saved in heating should offset any operation or maintenance costs associated with the ventilation system.

4.2.3.1 Highway Noise Impacts

The CRC project's noise analysis indicates that NRHP-eligible resources would experience elevated noise levels. Highway noise, if unmitigated, would impact the VNHR (at the Post Hospital, Officers Row, and the Village) as well as the Fort Motel, Evergreen Inn, and Normandy Apartments. The specific findings regarding these and other structures can be found in the Noise and Vibration Technical Report. For most of these impacts, mitigation in the form of sound walls will be built as part of the project.

The noise levels for second floor units at the Fort Apartments and Normandy Apartments will have elevated noise levels that cannot be mitigated with a cost-effective noise wall. These units already have noise levels which exceed FHWA thresholds for impact analysis. The lower units in the Normandy apartments will actually benefit from the new walls, and have lower noise levels than in existing or no build scenarios. The upper units of the Normandy Apartments would experience a two decibel increase from existing noise levels and only a one decibel increase from No-Build to the LPA Full Build. This degree of change is less than the three decibels which constitutes the smallest change noticeable to the human ear. This impact would not constitute an adverse effect as the impacts will not negatively affect the setting and use. The Fort Apartments will experience slightly higher noise levels, which will not be mitigated. However, the Fort

Apartments does not have character defining outdoor uses, and no residential sound insulation is proposed for the highway noise impacts. The increase for the Fort Motel is also only two decibels from existing or the no build. Noise at the Evergreen Inn (formerly the Evergreen Hotel) would also only increase two decibels from the no build scenario.

In the Village area and at the Hospital, noise levels would be equal to or less than with No-Build. In the upper northwest corner of the Reserve (the far western end of Officers Row) noise levels would increase over No-Build. This would contribute to the determination of an adverse effect to the VNHR by negatively affecting the setting and use. Unlike the residential properties described above, the resources of the VNHR are used for outdoor interpretation and other NPS visitor programs. The setting of these historic resources, which are also tourist and educational attractions, are more susceptible to noise impacts.

4.2.3.2 Light Rail Noise Impacts

For the purpose of the noise analysis, the downtown area was divided into three areas. The first segment is from the north shore of the Columbia River to W 6th Street, the second is along Washington and Broadway Streets north of W 6th Street, and the third is along McLoughlin Boulevard. No noise impacts were identified between the bridge and W 6th Street. Project noise levels at the Smith Tower are predicted to range from 58 to 60 dBA Ldn,¹ with the higher level at lower floors. The criteria for impacts at the Smith Tower ranged from 61 to 66 dBA Ldn and no noise impacts were identified. The only noise sensitive land use (within historic structures) identified along Washington Street is the St. James Church at 218 West 12th Street. Noise levels at the St James Church, at 218 West 12th Street, are predicted at 58 dBA, which is below the category 3 criteria of 67 dBA.

Light Rail noise impacts occur along 17th Street. Along 17th Street, project noise levels are predicted to meet or exceed the FTA criteria at 20 single-family residences between C Street and G Street. Of those, three have been identified as NRHP eligible (307 E 17th Street, 404-406 E 17th Street, and 604 E 17th Street). East of G Street the existing ambient noise levels are sufficiently high enough that there is no noise impact due to light rail operations. Light rail noise levels ranged from 0 to 2 dBA over the FTA criteria, with future light rail noise levels ranging from 57 to 63 dBA Ldn. See the Noise and Vibration Technical Report for details.

Light rail noise impacts are minimized by sound barriers, track lubrication at curves, and other features designed into the infrastructure itself. Along 17th Street, residential sound insulation and/or ventilation systems would also be part of the project mitigation. Sound insulation for each structure would be determined on a case-by-case basis during the final design stage. Given that these measures would be taken for NRHP-eligible houses, the rehabilitations will be reviewed for consistency with the Secretary of the Interior Standards for such. For example, storm windows would have to be compatible with the original window designs and not introduce new, architectural impacts.

4.2.4 Visual Impacts

The primary elements of the LPA that would affect the visual quality and character of the API are the new bridge structures, including transit bridges, across North Portland Harbor and the Columbia River, and the transit stations and guideways along neighborhood streets. The visual

¹ Another noise level descriptor is the Day-Night Equivalent Sound Level, Ldn, also abbreviated DNL, which is defined as the 24-hour Leq, but with a 10 dB penalty assessed to noise events occurring at night (defined as 10:00 p.m. to 7:00 a.m.). The effect of this penalty is that any noise event during the nighttime hours is equivalent to ten events during the daytime hours. This strongly weights Ldn toward nighttime noise to reflect most people being more easily annoyed by noise during the nighttime hours when background noise is lower and most people are sleeping.

quality of the entire length of the corridor and all landscape units would be at least slightly affected. Visual impacts would occur from: the greater heights and widths of the new structures across the Columbia River; the reconfigured interchanges at Marine Drive, Hayden Island, SR 14, Mill Plain, and SR 500; and the effective widening of the I-5 corridor due to the addition of auxiliary lanes along I-5.

The visual quality and aesthetics assessment were based on the synthesis of a set of broad criteria that include pedestrian or motorist experiences, the presence of panoramic or scenic views, the overall character and quality of the area, scale and contrast between elements in the area, and other factors. Please refer to the Visual and Aesthetics Technical Report for additional information. There are three generally accepted impact levels (low, moderate, high) used to assess and summarize impacts to visual resources. To gauge the degree of visual impact, the project team visited the project area and documented key views of the I-5 bridges and highway with photographs, and conducted visual quality and character evaluations from selected viewpoints to determine the existing “before” and altered “after” rankings. The following discussion focused only on key viewpoints for which the “before” and “after” visual assessments constitute a high degree of change.

A high degree of change occurs for views of the Hayden Island interchange, the Columbia River bridges, the SR 14 interchange as seen from the VNHR, new light rail stations, park and ride facilities at Clark College and Mill Plain Boulevard, and from within the I-5 corridor. Of the views which would experience a high degree of change, only the following will also constitute adverse effect to a listed or eligible historic resource (Exhibit 4-5).

The Clark County Historic Museum, in the old Carnegie Library building, is across Main Street from a proposed, large park and ride facility. The adopted Vancouver City Center Vision calls for high-density vertical development throughout this area. Since the designs for these park and ride facilities are not yet developed, it is not yet possible to ascertain whether design elements (such as façade articulation, a pedestrian-scale building podium, finishing materials, landscaping, etc.) could fit the building appropriately into the historic building context of the immediate area. The setting of the Museum is not a documented part of the resource. The building was nominated in 1977 under Criteria A and C. Criteria C is for the buildings unique architecture. Criteria A is because the library was part of a significant, broad pattern of development. A key to this broad pattern was the Hidden brick factory and yard, which was west and south of the library. There is a historically significant context between the library and the Hidden houses to the south. But, the context is no longer evident, as many newer buildings have been constructed throughout the area. The visual impact to the setting does not result in an adverse effect to the building.

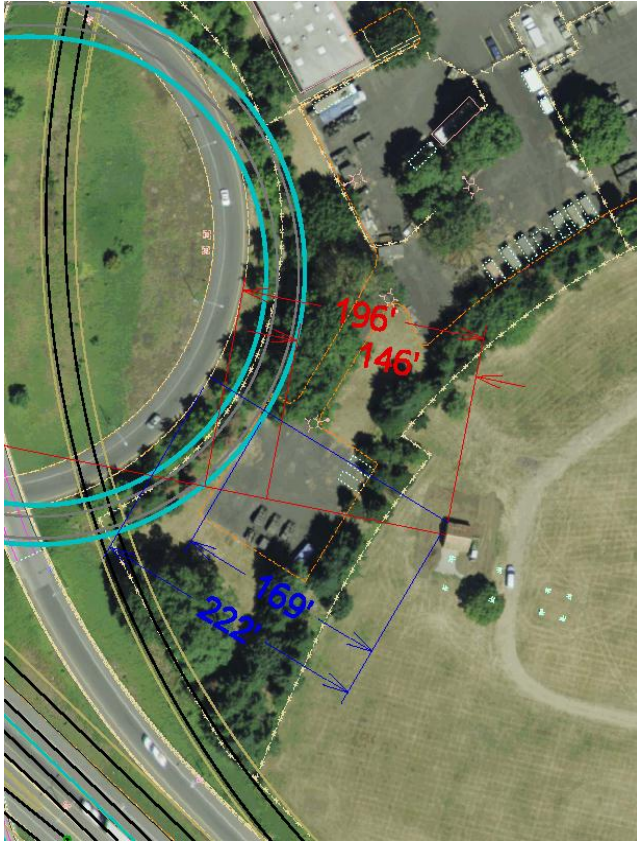
Exhibit 4-5. Visual Impacts

DAHP ID	Resource Name and Parcel Info	Construction Date	Potentially Eligible Historic	Section 106 Level of Effect from Visual Impacts
368	Vancouver National Historic Reserve (Barracks Hospital and Village Area)	1903	Listed National	Adverse visual impact from loss of east side buffer and construction of nearby wall.

Further visual intrusion of the ramps of the I-5 /SR 14 interchange on the Fort Vancouver Village was assessed for potential impacts. Within the HBC Village house reconstruction area, the interchange would place a ramp structure approximately 50 feet closer to the Village recreational interpretive area. Similarly, the LPA will be much nearer to the Barracks Hospital, removing landscaping, pedestrian access and Anderson Street. The great proximity of these enlarged facilities constitutes an adverse visual effect. The graphic below depicts the difference between

the locations of the existing facility and the facility resulting from construction of the LPA (Exhibit 4-6).

Exhibit 4-6. Plan View Graphic Showing Location of Proposed Loop Ramp



For Pearson Airfield the obstruction of the westbound departure obstacle clearance surface is unavoidable due to the marine clearance needed below the bridges, which has dictated the height of the proposed new bridges. However, this would not prevent the continued use of the airfield or change any character-defining features.

5. Temporary Effects

5.1 Introduction

The LPA may include the temporary effects listed below and may impact historic resources. Substantial construction-related impacts to historic resources are not anticipated *except to* the Fort Vancouver Barrack’s Hospital building and the Clark County Historic Museum (Carnegie Library), which must be monitored for vibration during construction.

The LPA may require temporary construction easements for construction throughout the project area. Project designers have conceptually identified narrow strips of land along the roadway and transit alignments, which are identified below. The project anticipates that the construction specifications would require that properties be restored to landowners in their original condition after construction is complete. Additionally, the project may require large staging sites or casting yards as described below.

5.2 Temporary Construction Easements

The temporary construction easements are required at the locations shown below. These temporary construction easements are necessary to rebuild sidewalks, construct retaining walls, and accommodate other project elements (Exhibit 5-1). For each of the historic structures on following properties there would be no effect.

Exhibit 5-1. Historic Resource Impacts by Temporary Construction Easements

DAHP ID#	Resource Name and Parcel Info	Temporary Property Acquisition (square feet)	Reason for Temporary Impact
35	W Foster Hidden House 110 W 13th Street 47101000	583 sq.ft.	Reconstruction of sidewalks
38	Vancouver Telephone Exchange 112 W 11th Street 51830000	425 sq.ft.	Reconstruction of sidewalks
1045	Washington Mutual/ Chase Bank 1205 Broadway Street 39490000	1269 sq.ft.	Reconstruction of sidewalks
1043	City Hall 210 E 13th Street 39360000	300 sq.ft.	Reconstruction of sidewalks
116	Residence 307 E 17th Street 40890000	288 sq.ft.	Reconstruction of sidewalks
129	Commercial 404-406 E 17th Street 41255000	540 sq.ft.	Reconstruction of sidewalks
119	Residence 415 E 17th Street 40790000	396 sq.ft.	Reconstruction of sidewalks
133	Residence 604 E 17th Street 41380000	244 sq.ft.	Reconstruction of sidewalks

DAHP ID#	Resource Name and Parcel Info	Temporary Property Acquisition (square feet)	Reason for Temporary Impact
132	Commercial 612 E McLoughlin 41607000	400 sq.ft.	Reconstruction of sidewalks
130	Residence 700 E McLoughlin 41520000	275 sq.ft.	Reconstruction of sidewalks
61	Residence 3000 K Street 13725000	1154 sq.ft.	Construction of retaining wall
74	St. James Catholic Church 218 W 12th Street 51580000	2,090 sq.ft.	Reconstruction of sidewalks
368, 369 918, 109	VNHR 38279906; 38279927; 38279911; 38279935	7,407 sq.ft.	Construction of retaining wall along I-5
918	Officers Row 654 Officers Row 38279911	1,135 sq.ft.	Construction of retaining wall along I-5
993	Kiggins Bowl 800 E 40th Street 12454005	2,982 sq.ft. ^a	Construction of retaining wall along I-5

a This impact would be deferred under the LPA with highway phasing.

5.3 Casting and Staging Areas

Construction activities would require at least one large site to stage equipment and materials, and may also require a large site for use as a casting yard for fabricating segments of the new bridges. Staging of equipment and materials would occur in many areas along the project corridor throughout construction, generally within existing or newly purchased right-of-way or on nearby vacant parcels. However, at least one large site would be required to stage the larger equipment, such as cranes, and materials, such as rebar and aggregate, as well as for construction offices. Such a site would be as close as possible to the construction zone, but would likely not be possible within public right-of-way and would thus require temporary use of a nearby parcel.

Three sites have been identified as possible major staging areas, as shown in Exhibit 5-2.

1. Port of Vancouver site: This 52-acre site is along SR 501 and near the Port of Vancouver's Terminal 3 North facility. Most of the property has an asphalt concrete surface. For staging purposes, any improvements would most likely be on top of this surface. Activities could consist of material storage, material fabrication, equipment storage and repair, and temporary buildings. This site is currently used as a staging area for windmill components, and has heavy industrial zoning. A windshield survey of the area did not find any buildings; thus, there would be no direct or indirect effects caused by the expansion.
2. Red Lion at the Quay Hotel site: This 2.6-acre site would be partially acquired as a result of this project, requiring the demolition of most of the building on this site. As such, it could make an ideal area for staging materials and equipment, and some small fabrication. Temporary buildings such as trailers or other mobile units could be used as construction offices. No historic resources have been found at this site.

3. Old Thunderbird Hotel site: This 5.6-acre site is much like the Red Lion Hotel site in that a large portion of the parcel is required for new right-of-way necessary for the LPA. The same types of activities could occur on this site as on the Red Lion hotel site. This site has commercial zoning, the code for which is not explicit about project staging areas. Further discussions with the City of Portland would be necessary to permit the use of this site. No historic resources have been found at this site.

A casting/staging yard would be required for construction of the over-water bridges if a precast concrete segmental bridge design is used. A casting yard would require similar characteristics as the major staging areas; specifically, it would need access to the river for barges, a large area suitable for a concrete batch plant and associated heavy machinery and equipment, and access to a highway and/or railway for delivery of materials.

Two sites have been identified as possible major casting/staging areas (Exhibit 5-2).

- 1 Port of Vancouver Alcoa/Evergreen West site: This 95-acre site was previously used as an aluminum factory and is currently undergoing environmental remediation, which should be completed before construction of this project is begun. The western portion of this site, which is best suited for a casting yard, currently contains two large settling ponds. However, long-term plans call for acquisition of nearby land and relocation of these ponds. Casting could be an allowed use on this site, which is zoned heavy industrial. A windshield survey of the area did not find any buildings 45 years old or older that met the criteria of the NRHP; thus, there would be no direct or indirect effects caused by the use of this site.
- 2 Sundial site: This 50-acre site is between Fairview and Troutdale, just north of the Troutdale Airport, and has direct access to the Columbia River. Recently, it has been used by Gresham Sand and Gravel as an aggregate quarry. Casting could be an allowed use on this site, which is zoned heavy industrial. A windshield survey of the area did not find any buildings 45 years old or older that met the criteria of the NRHP; thus, there would be no direct or indirect effects caused by the use of this site.

5.4 Other Temporary Effects

Temporary effects have the potential to be significant for business owners and residents within the primary APE because the project will require many years to complete. The disruption to downtown Vancouver may have an effect on the economic viability of businesses conducted in historic commercial buildings. Frequent users of the bridges will experience delays, but it is expected that these delays will be actively and positively managed with transportation management measures such as detours, public information, and others. It is not anticipated the temporary effects would have adverse effects on historic buildings. However, during construction the economic viability of the businesses in the downtown historic buildings would likely diminish because of access and parking issues.

The noise and vibration analysis does not identify a potential construction-related impact to historic buildings. The vibration levels would not jeopardize the structural condition of these buildings. However, considerable concern has been expressed by the owners of two buildings in particular: the Barracks Hospital building (DAHP ID 368) and Clark County Museum (Carnegie Library, DAHP ID 42). Both structures are of unreinforced masonry construction; and the owners are concerned that the buildings will experience proximate vibration impacts associated with the construction of roadway segments, retaining walls, sound walls, and other project elements. These are being discussed in this section, as any vibration impacts would result from project

construction, not operation. Though, it is understood that effects resulting from construction (if there were any) would likely be permanent.

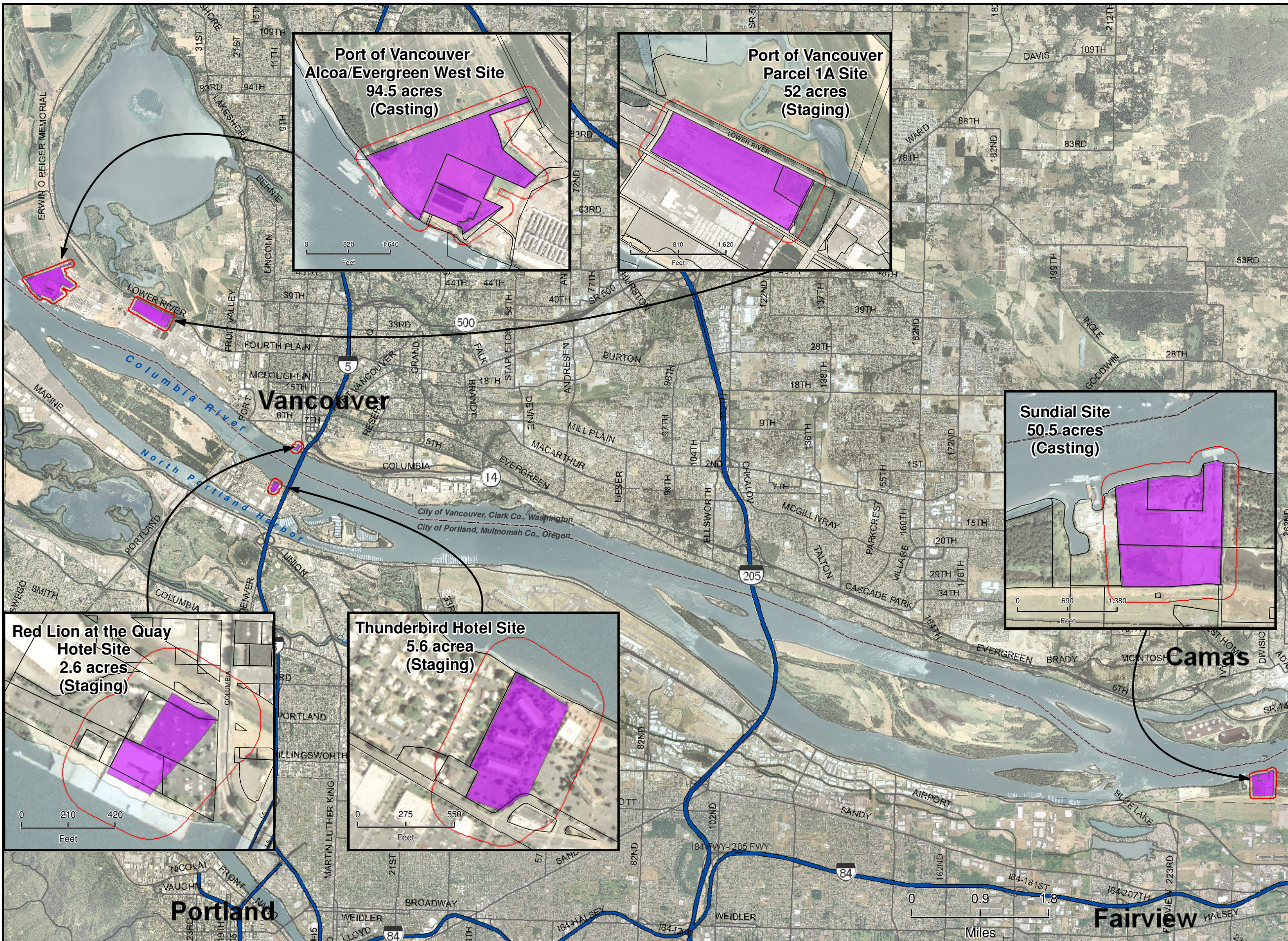
In order to ensure that no damage is done to these buildings during construction, vibration will be actively measured and monitored.




Construction related noise also has the potential to adversely affect planned visitor programs at the VNHR. The NPS, Fort Vancouver National Trust, and the City of Vancouver partner together to provide numerous events, many of which are outdoors and somewhat near I-5.

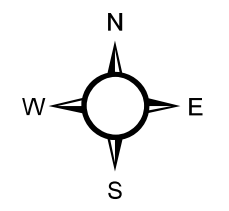
Other temporary effects could include:

- Noise impacts due to construction
- Effects to air quality due to construction equipment
- Traffic spillover during construction
- Traffic detours and delays during construction

Exhibit 5-2. Potential Staging Areas and Casting Yards



-  Parcel Boundaries
-  Proposed Staging and Casting Areas
-  Area of Potential Effect



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6. Recommended Mitigation for Long-term Effects

WSDOT, ODOT, FHWA, FTA, TriMet, and C-TRAN will take reasonable measures to identify ways to minimize the project's adverse effects on historic resources. Measures may include, but not necessarily be limited to:

- Minimizing the acquisition area by narrowing the width of facility structural elements such as bike lanes, shoulder widths, travel lane widths, or structure heights, provided such changes are consistent with minimum standards for the facility type.
- Minimizing adverse effects to aesthetics/setting by planting trees and shrubs to enhance the view from historic properties and shield these properties from visual effects resulting from the project's introduction of facilities that compromise the historic setting.

For unavoidable adverse effects to historic properties, mitigation plans will be designed and drafted in consultation with the Oregon SHPO, Washington DAHP, and other consulting parties as appropriate. Mitigation or project enhancement measures might include, but are not necessarily limited to:

- Taking measures to promote moving a historic building that would be otherwise be destroyed by the project, provided any significant original historic context associated with the historic property is first documented.
- Preparing Historic American Building Survey/Historic American Engineering Record (HABS/HAER) documentation on historic buildings/structures to be removed (this has already been completed for the 1917 I-5 bridge structure).
- Preparing interpretive panels and placing them in locations available to the public to describe the history and historic resources in the area.
- Working with appropriate museums and curatorial facilities to support elements of their ongoing programs that could offset project impacts in some manner.
- Requiring that if any construction adversely affects landscaping elements contributing to the NRHP listing or eligibility of a historic property, these elements be returned to their original condition when the project is completed.

Such mitigation measures must be approved in an MOA, preferably prior to issuance of the NEPA FEIS, and necessarily before the NEPA ROD. The MOA will document which effects are mitigated, who will implement which measures, how they will implement them (e.g., funding mechanisms or provision of staff or documents), time frames for mitigation phasing and completion, and where mitigation measures shall occur. As a continuing element of the Section 106 consultation process, FHWA should be in consultation with the NPS with respect to the VNHR.

Specific mitigation measures will be discussed once more specific effects are known and coordination with the appropriate owners and vested agencies has occurred.

6.1 Memorandum of Agreement

The FHWA and FTA are the NEPA co-lead agencies providing financial assistance for the CRC project. FHWA and FTA have determined that construction and operation of this project will result in adverse effects to historic properties and have consulted with the Oregon and Washington state historic preservation offices and the Advisory Council on Historic Preservation (Council) pursuant to 36 CFR Part 800.6 and 800.14, regulations implementing Section 106 of the National Historic Preservation Act (16 United States Code [USC] Section 470f). FHWA and FTA have also consulted with the NPS, Certified Local Governments, and nine consulting Indian tribes. The technical assessment of project effects, the stipulations governing additional assessment of effects, and the development of mitigation will be guided by an MOA assigned by the parties listed above. The draft MOA is still under consideration by project partners. The final MOA will dictate the mitigation measures for effects to historic resources. The mitigation measures described below are proposed for inclusion in the MOA.

6.1.1 Continued Participation

FHWA and FTA will ensure that agency and public participation in the review process is carried out consistent with the intent of 36 CFR 800. Reports on historic properties will be made available for review to the general public at the CRC Project Office; documentation that includes sensitive information exempt from the Freedom of Information Act will not be readily available for public review. The views of the DOT, interested parties, The Portland Historic Landmarks Commission, the Clark County Historic Preservation Commission, the Fort Vancouver National Trust, as well as the general public will be considered by FHWA and FTA with respect to the terms of the MOA and proposed mitigation.

The schedule for project implementation will be developed as funding becomes available; this will necessitate phasing of the additional cultural resource identification, evaluation, effect determination, and mitigation in accordance with 36 CFR 800. Consequently, the stipulations identified in this MOA may be carried out over several years. FHWA and FTA will ensure that appropriate measures are undertaken during the development of the design and construction phases of the project.

6.2 Mitigation for Long-term Effects to Historic Resources in Oregon and Washington

6.2.1 1917 I-5 Bridge

The 1917 northbound bridge is in the NRHP and will be adversely affected if it is removed by the project. FHWA and FTA will ensure that all efforts will be attempted to find an alternative use through a Bridge Marketing Plan. Possible alternative uses include separating and relocating individual spans, if relocation of the bridge in its entirety is not feasible. If the plan determines that it is not feasible to pursue moving and relocating the structure for adaptive reuse, HABS/HAER documentation, including applicable photography and drawings, may be updated. Dismantling of the bridge for potential reconstruction in an alternative location will also be examined. If appropriate, decorative or interpretive structural elements will be offered to local historical societies/museums or other interested parties. As the bridge is a critical component of the regional historic landscape, contributions should be made to interpretive programs and small projects which will result in documentation, waysides, exhibits, or other means of communicating the structure's history and meaning to the general public.

6.2.2 Pier 99

Pier 99 has been determined eligible for the NRHP and may be adversely affected by the project. FHWA and FTA will ensure that all efforts will be attempted to find an alternative use through a Historic Structure Marketing Plan. Given the structural design and condition of the building, there is little likelihood that the structure can be relocated. HABS/HAER documentation, including applicable photography and drawings, will be sought. If appropriate, decorative or interpretive building elements will be offered to local historical societies/museums.

6.3 Historic Impact of Noise Mitigation Measures

Residential indoor noise mitigation measures often include the replacement of older windows with new insulated windows. When such window replacements are considered for historic buildings, the Secretary of the Interior's Rehabilitation Design Standards would be used as a guide. Window replacements would retain the same design and look of the original windows—the same arrangement, surrounds, and materials—to the extent practicable.

6.3.1 Barracks Hospital

The Barracks Hospital is part of the army quarters of the VNHR and is a contributing structure within the NRHP District. The proximity of the proposed retaining wall and roadways constitute an adverse impact to this resource. FHWA and FTA will consult and coordinate documentation with appropriate parties at the NPS and project design/engineering landscaping specialists regarding mitigation of impacts of the design, as well as those impacts anticipated during construction. In addition FHWA and FTA will consult with NPS on a reasonable range and choice of appropriate mitigation measures such as building the Community Connector (the “lid”) between downtown and VNHR at Evergreen Boulevard, integrating access to the hospital with pedestrian circulation plans for the proposed lid, and landscaping/noise buffers. See Section 6.3.3 for details regarding the proposed Community Connector.

6.3.2 VNHR Historic Landscape and Visual Effects

The VNHR Historic District has four cultural landscapes as substantial components of its significance. The four identified cultural landscapes include the Great Meadow area of the HBC, the Reconstructed Fort and associated Village, the Army Parade Grounds and Barracks, and the Mission 66 Headquarters buildings and Visitor Center. The Cultural Landscape of the Village area will be impacted, as will the cultural landscape of surrounding the Hospital building. FHWA and FTA will ensure coordination with VNHR staff to develop a Visual Management Plan or work with visual elements of an existing VNHR management plan addressing visual impacts, so that all project design elements are consistent and compatible with VNHR goals. FHWA and FTA would consult and coordinate with VNHR staff regarding indirect effects of noise and visual aspects associated with construction of the highway and potential noise wall, to design an aesthetically appropriate structure and develop screening and landscaping plans for the SR 14 interchange.

6.3.3 Community Connector

A “lid” over the interstate – the Community Connector – has been conceptually developed to serve as mitigation for a number of different adverse impacts. The property acquisition on the west side of the Hospital building, and the accompanying adverse effect to the cultural landscape, would be mitigated if a lid over the freeway could provide a similar landscape and accessibility is improved.

A Community Connector Design Competition was initiated by the City of Vancouver in order to develop a design for a lid immediately south of the Evergreen Boulevard crossing (see Exhibit 6-1). The design, as proposed, will not be constructed in its entirety. The design competition provided inspired artistic visions of the Community Connector. However, highway engineering standards, especially, those for safety and ventilation, have led project staff to design a smaller lid (near to 300 feet in width) which will not require exhaust fans and other potentially costly, unsightly, and noisy apparatus.

The competition was managed by Donald Stastny, FAIA FAICP, of StastnyBrun Architects, Inc. The design competition jury included the following members:

- Roger Boothe, Director of Urban Design, City of Cambridge, Massachusetts
- Hank Florence, NPS Historic Architect and Manager of External Cultural Programs for the Pacific West Region
- Richard Haag, Dean Emeritus, Dept. of Landscape Architecture, University of Washington
- Daniel Hunter, Co-director, Access to Design Professions
- Pat Jollota, Mayor Pro Tem, City of Vancouver, and published historian
- Michael Pride, Associate Professor, University of Cincinnati School of Architecture and Interior Design
- Don Wagner, Southwest Regional Administrator, Washington Dept. of Transportation
- Matt Ransom, Transportation Project Manager, City of Vancouver, Ex Officio
- Elson Strahan, President and CEO, Fort Vancouver National Trust, Ex-Officio

Exhibit 6-1. Community Connector Design Submittals



The bridge will also be pre-stressed, precast concrete to maintain the same construction practices as for the rest of the project. Noise barriers will be concrete walls following the edge of I-5 and

tying in to the edges of the cover structure. The following descriptive text was developed by the winning design team:

*... an area known as the 'Grotto' has walls that angle inward to control sound transmission and frame the sky against a continuous, unbroken aperture. Passing underneath the new, reclaimed ground, rows of sculpted columns indicate clear paths of travel through the earth while allowing lateral views and increased access to ambient light. Tall evergreen trees hint at the land above, where three landscapes converge: Fort Vancouver, the Harvest Meadows, and the Northwest Meadow, where the evergreen is a hallmark of the landscape at the historic Veterans Hospital. Rustic Douglas Fir (*Pseudotsuga menziesii*) and Cedar (*Thuja plicata*) trees augment the western facade of the Veterans Hospital. In its foreground, the facade's reflection ripples across a woodland pond, its edges are softened by the surrounding meadow's rich mosaic of native grasses, ferns, and perennials. The hospital commands the view of the decidedly picturesque landscape, an era of landscape that the British Hudson's Bay Company brought with them as they arrived to a region once cloaked in dense fir forests."*

CRC project staff have collaborated with the City of Vancouver, NPS, and FVNT to modify the designs, while still achieving the primary purposes of the lid. The finish treatments of this new design are as yet unresolved. However, the general shape, position, and location of the structure has been agreed to. The structure crosses the Interstate between the Riverwest development and the hospital, providing east-side pedestrian access north of the hospital building (Exhibit 6-2).

The City of Vancouver, in cooperation with the CRC project, is developing design concepts for the Community Connector. An image of which will be provided here before publication.

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7. Mitigation for Temporary Effects

Mitigation measures for temporary adverse effects to historic properties typically involve measures that correspond to those identified in other discipline reports, particularly land use, noise and vibration, and aesthetics. Special mitigation measures may be identified to ensure that, for example, noise mitigation measures are implemented for special cultural events related to historical appreciation at historic sites.

7.1 Vibration Impacts

The owners of the Barracks Hospital building (DAHP ID 368) and Clark County Museum (Carnegie Library, DAHP ID 42) have expressed concern about construction-related, vibration impacts. In order to ensure that no damage is done to these buildings during construction, vibration will be actively measured and monitored. The Cultural Resources MOA includes provisions for such which will include standard tolerances for vibration impacts and recommended management practices to mitigate vibration impacts.

Construction related noise also has the potential to adversely affect planned visitor programs at the VNHR. The DOTs will ensure that construction teams coordinate with these interests, and avoid or minimize the potential disturbances to these events. Geotechnical monitoring would consist of providing installation, monitoring, maintenance, and removal of geotechnical vibration monitoring equipment. This equipment would monitor vibration levels as required by the final mitigation agreement or MOA, with elements such as those recommended below.

A construction design engineer would be designated before site activities begin; this person would be responsible to collaborate with respective building owners and stewards of impacted resources. The construction design engineer would be a professional engineer licensed under Title 18 Revised Code of Washington [RCW], State of Washington, with a minimum of 5 years of experience in vibration and monitoring.

The construction design engineer would provide:

- Two portable seismographs at each site for monitoring velocities of ground vibrations resulting from construction activities, as approved by the engineer. Each seismograph shall include an external triaxial geophone, three channels for vibration monitoring, two power sources, self-triggering waveform capture mode, and a continuous monitoring mode.
- Computer software for performing continuous monitoring, data downloading, analyses, and report production.

The monitoring equipment must conform to the following measurement requirements:

- Seismic range of 0.005 to 10 inches per second.
- Accuracy plus or minus 3.0 percent of the measured peak particle velocity or better at frequencies between 3 hertz and 250 hertz.
- Resolution of at least 0.005 inches per second.

- Acoustic range of 88 to 148 dB (referenced to 20 microPascals) with an accuracy and resolution of plus or minus 0.3 dB.
- Frequency response (plus or minus dB points) of 2 to 250 Hertz.
- Internal dynamic calibration capabilities.

8. Permits and Approvals

Several federal, state, and local environmental laws and regulations addressing historic resources may require permits and approvals.

8.1 Federal

National Historic Preservation Act (NHPA) of 1966 (P.L. 102-575; 16 USC 470), as amended. 36 CFR 800. 40 CFR 1508.27. Executive Order 11593. This act is the primary authority used in complying with the nation's cultural resources protection objectives. It is implemented through federal regulations (36 CFR 64, 36 CFR 800, 40 CFR 1508.27).

- As required by Section 106 of the National Historic Preservation Act (1966) the SHPO and DAHP must be consulted and have the opportunity to comment on the APE, determinations of eligibility for the National Register of Historic Places, level of effect, and all MOA. As described in 36 CFR 800.1 to 800.7 also known as the Section 106 Process.
- FHWA and FTA must agree and approve all Section 106 findings and mitigation plans and Section 4(f) Evaluations required by the Federal Highway Act (1966).

8.2 State

Section 106 of the National Historic Preservation Act requires SHPO consultation and agreement and supersedes state laws.

8.3 Local

The City of Portland, City of Vancouver, Multnomah County, and Clark County planning departments and local historic resources commissions are considered interested parties and should be informed about the effects on historic properties and resources in their jurisdictions.

Alteration or demolition of any structure listed on the Clark County Heritage Register will require a Certificate of Appropriateness (C of A) from the Clark County Historic Preservation Commission. No alterations or demolitions to listed structures have been identified.

The northbound I-5 bridge is listed on the National Register of Historic Places. National Register-listed properties are subject to a demolition review process by the Portland Landmarks Commission. The Bureau of Development Services (BDS) is responsible for conducting this as a type of land use review. The Landmarks Commission recommendation is advisory to City Council. See Zoning Code section 33.445.810 for additional details.

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