

INTERSTATE 5 COLUMBIA RIVER CROSSING

Public Services Technical Report for the Final Environmental Impact
Statement



May 2011



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Cover Sheet

Interstate 5 Columbia River Crossing

Public Services Technical Report for the Final Environmental Impact Statement:

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ACRONYMS

API	area of potential impact
BNSF	Burlington Northern Santa Fe Railroad
CCFM	Clark County Fire Marshal
CD	collector-distributor
COVFD	City of Vancouver Fire Department
CPUD	Clark County Public Utility
CRC	Columbia River Crossing
CTR	commute trip reduction
C-TRAN	Clark County Public Transit Benefit Area Authority
DEIS	Draft Environmental Impact Statement
DOT	U.S. Department of Transportation
ECO	employee commute options
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
I-5	Interstate 5
LOS	level of service
LPA	locally preferred alternative
LRV	light rail vehicle
MAX	Metropolitan Area Express
Metro	Metropolitan Regional Government
NEPA	National Environmental Policy Act
ODOT	Oregon Department of Transportation
ORT	open road tolling
OSP	Oregon State Police
OTC	Oregon Transportation Commission
PF&R	Portland Fire and Rescue
ROD	Record of Decision
RSD	Ridgefield School District
RTC	Regional Transportation Council
SPUI	single-point urban interchange
TDM	transportation demand management
TriMet	Tri-County Metropolitan Transportation District
TSM	transportation system management
USPS	United States Postal Service
VCPRD	Vancouver-Clark Parks and Recreation Department
VPD	Vancouver Police Department
VSD	Vancouver School District

WSDOT	Washington State Department of Transportation
WSP	Washington State Patrol
WTC	Washington Transportation Commission

1. Summary

1.1 Introduction

This report evaluates potential impacts to public services that would result from the proposed Interstate 5 (I-5) Columbia River Crossing (CRC) Locally Preferred Alternative (LPA). The two overall questions guiding the effects analysis are:

- Will long-term use and operation of the LPA affect existing or planned facilities or provision of services provided by public services?
- Will construction activities of the LPA affect the facilities or provision of services provided by public services?

This report identifies the likely impacts from the LPA and potential measures to reduce the impacts, including possible options for avoiding, minimizing or mitigating impacts.

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: Loc

al 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 Long-term Effects

The majority of the public services considered in this report will experience no long-term impacts to their respective facilities. Services with no direct impacts include:

- Fire and Life Safety
- Law Enforcement
- Solid Waste Management
- Postal Service
- Cemeteries

The LPA will directly impact six public service facilities, one medical center property, two sites related to schools, and three non-categorized facilities. There will be a very minor permanent right-of-way acquisition that will remove landscaping in the far northwest corner of the property that houses the Clark County Center of Community Health (Veterans Administration - Vancouver Campus). Discovery Middle School and the adjacent, Kiggins Bowl athletic fields will have minor right-of-way acquisition, and Clark College Athletic Annex and associated parking will be displaced. The other public service facilities being directly impacted include the ODOT Permit Station and Field Office on Hayden Island, which will be fully displaced, and the Clark Public

Utilities District building adjacent to the bridge, just north of the Columbia River, which will also be fully displaced. The FHWA Western Federal Lands office just East of I-5 and north of Fort Vancouver will have minor right-of-way acquisition impacting parking spaces.

Long- term effects also include some delays at intersections along Main Street and 39th Street in Vancouver under the LPA and the No-Build scenarios. There are fewer intersections exceeding standards with the LPA (compared with the no-build), so there would be fewer traffic delays affecting mobile public services.

1.4 Short-term Effects

The LPA may include the temporary effects listed below. Mitigation measures for these effects are discussed in Section 6 of this report.

- Temporary easements for construction staging areas. These temporary acquisitions would be returned to the landowner after construction is complete or purchased for transit-oriented development. The locations of staging areas are yet to be confirmed based on final engineering designs.
- 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.

Construction of transit alternatives in downtown Vancouver may cause delays for mobile public services traveling either through downtown to another destination, or traveling within downtown to reach an emergency location near areas under construction. These effects would be temporary and no specific mitigation is proposed.

1.5 Proposed Mitigation for Long-term Effects

There are three types of long-term adverse effects to public services: minor right-of-way acquisitions, full building displacements, and traffic impacts to mobile services. Potential mitigation for these impacts is described for each type of impact below.

1.5.1 Minor Right-of-Way Acquisition

Right-of-way purchased from public services property owners will be purchased for fair market value. For details refer to the Acquisitions Technical Report. No additional mitigation is proposed for minor right-of-way acquisitions that do not affect the current use of the property.

1.5.2 Full Displacement

The three public service properties being displaced by the project include the building and parking facilities at the Clark College Athletic Annex, the ODOT Permit Station and Field Office, and the Clark Public Utilities District administration building.

Clark College Recreational Fields and Annex will be impacted by the loss of the building used for recreation equipment storage and the surface parking for events provided on the site. CRC, C-TRAN, the City of Vancouver, Vancouver-Clark Parks and Recreation Department (VCPRD),

and Clark College are exploring the possibility of a shared-use agreement for the new park and ride that would allow users of the Annex and the Community Center to the south to park in the new parking facility during non-peak commute hours. See the Parks and Recreation Technical Report for mitigation proposed to compensate for recreational losses from these impacts.

The ODOT Permit Station and Field Office is an ODOT facility. No mitigation for the loss of this building is proposed, and ODOT will determine where to replace the functions of the permit station.

No mitigation beyond required acquisition procedures is recommended for the displacement of the Clark Public Utility District (CPUD) administration building.

1.5.3 Traffic Effects

Many of the intersections that do not meet standards as a result of the LPA are intersections for which the project team, in cooperation with sponsoring agencies, will develop mitigation strategies. The data presented here show the preliminary findings before mitigation techniques have been employed. Mitigation strategies may include road widening and the acquisition of new right-of-way only to mitigate cases of extreme delay, and only when no other mitigations will produce acceptable conditions. Certain mitigations would improve an intersection that is just below standards, but these same mitigations would be ineffective for intersections with extreme delay.

For all temporary construction activities, detailed coordination about construction locations and phasing will be provided to the appropriate parties at law enforcement and fire and emergency responder services, and school transportation services. Especially for the emergency responders, this coordination needs to include any temporary access restrictions to highway on-ramps and exits, and critical emergency access routes.

1.6 Proposed Mitigation for Adverse Effects during Construction

For all temporary construction activities, detailed coordination about construction locations and phasing must be provided to the appropriate parties at law enforcement and fire, emergency responder services, and school transportation services. Especially for the emergency responders, this coordination would need to include any temporary access restrictions to highway on-ramps and exits, and critical emergency access routes.

A pre-construction communications plan should be developed with all affected emergency response agencies detailing how detour and road closure information will be provided to the services. The potential for arranging for back-up aerial emergency service (on-call emergency helicopter service) to transport patients across the river during bridge construction should be evaluated prior to beginning construction. This would mitigate for highway delays, especially for emergency incidents on Hayden Island during bridge construction.

During construction, as emergency responders monitor response times, if unacceptable delays are occurring due to construction, WSDOT and/or ODOT will meet with emergency service representatives to address construction concerns and develop solutions for better detour route communication.

In addition, where construction activity requires detours on routes typically used by the public to access public service locations (police and fire stations, hospitals, public schools, and post offices), detour signs would be provided.

2. Methods

2.1 Introduction

The analysis was developed to comply with the National Environmental Policy Act (NEPA), applicable state environmental policy legislation, and local and state policies, standards and regulations.

Public services include law enforcement, fire and emergency medical services (including hospitals), solid waste collection and disposal, federal post office service, public schools and school transportation, and cemeteries. Public transit, which is also a public service, is discussed in the Transportation Technical Report.

2.2 Study Area

This evaluation uses two study areas for environmental effects: the primary and secondary areas of potential impact (APIs). The primary API addresses direct impacts, and is similar across technical disciplines. Secondary APIs, the analysis units for many impacts, may vary by discipline. Project APIs are shown in Exhibit 2-1 and are described below.

2.2.1 Primary API

The primary API is the area most likely to experience direct impacts from construction and operation of the LPA. Most physical project changes would occur in this area, though mitigation could still occur outside of it.

As currently defined, the primary API extends about five miles from north to south. It starts north of the I-5/Main Street interchange in Washington, and runs to the I-5/Columbia Boulevard interchange in Oregon. North of the river, the API expands west into downtown Vancouver, and east near Clark College to include potential high capacity transit alignments and park and ride locations. Around the actual river crossing, the eastern and western sides each extend 0.25 mile from the I-5 right-of-way. South of the river crossing, this width narrows to 300 feet on each side.

2.2.2 Secondary API

The secondary API represents the area where indirect impacts could occur (e.g., traffic and development changes). The study team relied primarily on secondary data to evaluate indirect project impacts.

The secondary API, over 15 miles long, runs from a point approximately one mile north of the I-5/I-205 interchange south to the I-5/I-84 interchange. It also extends one mile on both the east and west sides of the I-5 right-of-way. Traffic projections helped determine the geographic extent of potential indirect impacts.

2.3 Effects Guidelines

The project team evaluated the degree to which the LPA would affect the provision of public services. The evaluation considered both long-term and short-term (temporary) impacts. Because

there are no regulatory guidelines to frame these impacts assessment, it was based on public service provider industry standards, or adopted strategic plans and goals.

The two overall questions guiding the effects analysis are:

- Will the long-term use and operation of the proposed I-5 CRC improvements affect existing or planned future facilities or provision of services provided by public services?
- Will the construction activities of the proposed I-5 CRC improvements affect facilities or provision of services provided by public services?

This evaluation considered the following specific questions for each public service discussed below.

2.3.1 Law Enforcement and Fire and Emergency Medical Services

- After the completion of the proposed I-5 CRC improvements, will fire and emergency medical response and law enforcement teams be able to reach accident or crime scenes as quickly as they would if no new crossing were built?
- Will detours or increased traffic during the construction of the proposed I-5 CRC improvements prevent the use of critical access routes such that service is detrimentally delayed?
- Will induced growth, as determined by the Land Use Technical Report, exceed growth planned for by these services? And, if so, will the induced growth require additional services?

2.3.2 Public Schools and School Transportation

- After the completion of the proposed I-5 CRC improvements, will school districts be able to collect and deliver students using the same major routes they would use without a new crossing? If a school location is affected, (e.g., sidewalks leading to a school are changed, or an intersection used by students is altered to remove the pedestrian crossing), would more or fewer students need to be bused to school?
- Will detours or increased traffic during construction of the proposed I-5 CRC improvements prevent the use of major routes such that service is detrimentally delayed, or additional students must be temporarily bused to school? For example, if roadways previously used by students walking to school would be made unsuitable for pedestrians during construction, then those students would need to be bused by the school district.
- Will induced growth, as determined by the Land Use Technical Report, exceed growth planned for by school services? And, if so, will the induced growth require additional services?

2.3.3 Cemeteries

- Will any cemeteries or direct access to cemeteries be displaced by the construction of the proposed I-5 CRC improvements?

2.3.4 Postal Service and Solid Waste

- After the completion of the proposed I-5 CRC improvements, will the transportation or facilities associated with the United States Postal Service (USPS) or municipal solid waste service be detrimentally affected? Will any facilities need to relocate, or will bulk transportation routes need to be shifted to new routes?

- Will detours or increased traffic during the construction of the proposed I-5 CRC improvements prevent the use of or access to USPS distribution centers or solid waste disposal or transfer facilities?

2.4 Data Collection Methods

Data for each public service (within the primary API) were gathered and analyzed. Where the facilities or key routes exist only within the secondary API, data were collected within the secondary API.

To answer the questions posed in this analysis, the project team collected information from:

- Existing facility and operations reports.
- Available maps for route information.
- Interviews with representatives from public services.

Coordination with public service agencies was primarily by telephone and electronic communication.

When needed, the team made site visits to public services facilities to confirm or refine collected information. To help ensure collaboration and consistency between analyses, in addition to direct data collection, coordination occurred with other environmental impact statement (EIS) technical reports, including Neighborhoods and Populations, Land Use, Transportation, Acquisitions, and Noise and Vibration. Information gathered from each of these reports is as follows:

- Neighborhoods: School and other public facility impacts.
- Land Use: Population, development forecasts, and induced growth.
- Transportation: Intersection level-of-service (LOS), travel time changes, traffic delay, and access changes.
- Acquisitions: Details of any facility displacements.
- Noise and Vibration: Details about increased noise at schools and other sensitive outdoor public service locations.

Existing reports and maps provided the basic understanding of how public services function within the primary and secondary APIs. Interviews with public services representatives provided the additional knowledge necessary to answer the key questions posed above. Project staff evaluated land identified for potential future use as public service facility sites within the primary API to determine if any direct impacts to these sites would occur. To the extent that this type of information is produced and updated by public services, it was used for this analysis.

See the Neighborhoods and Populations Technical Report for information on how the public would access fixed locations of these public services, for example, whether a facility would be separated from the neighborhood or parts of the neighborhood it currently serves.

2.5 Analysis Methods

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

Alternatives were evaluated to determine long-term effects on the movement and efficiency of public services by reviewing:

- Displacement of facilities or planned future facility sites;
- Traffic movement restrictions (e.g., closed roads, turning restrictions, one-way designations, or new median barriers); and
- Levels of traffic congestion, intersection performance ratings, and potential interference with movement of emergency service vehicles.

Staff evaluated LOS and delay time for approximately 128 intersections in the project area, and relied on the results of traffic modeling analysis to compare the LPA to the No-Build Alternative.

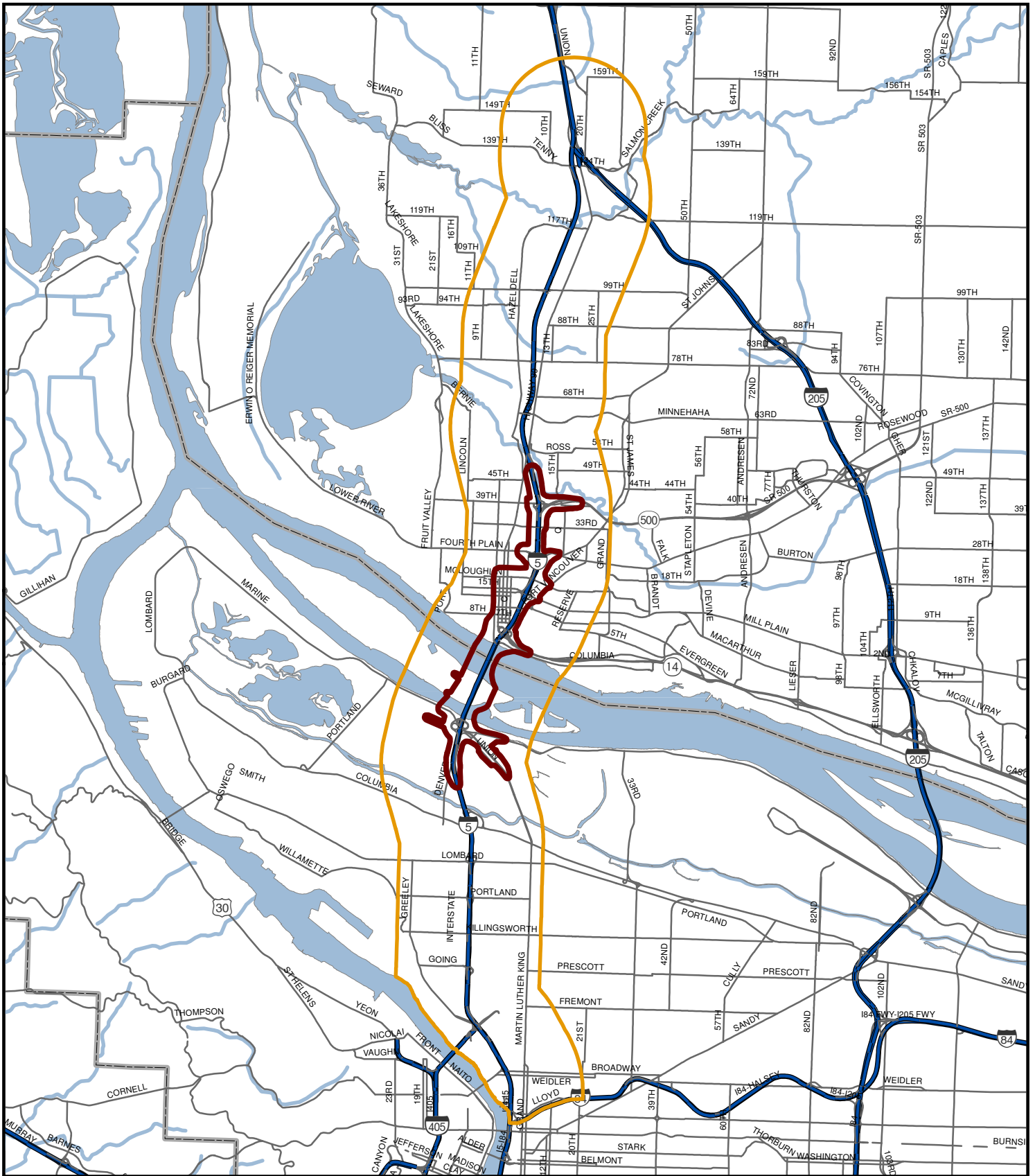
Emergency service vehicles use vehicle recognition signal priority technology at various intersections throughout the Portland-Vancouver metropolitan area and can pass through intersections against the signal if all other vehicles can move aside. The use of signal priority technology and emergency service right-of-way affects passage through intersections. Thus, although LOS and delay time analysis is useful in predicting overall impacts to services it is less accurate in predicting specific effects on emergency transportation. In some instances, an intersection may be physically constrained by project actions, such that other vehicles cannot move out of the way during an emergency. Thus, in addition to reviewing LOS and delay times at the approximately 128 intersections analyzed for the project, this analysis also reviewed intersections with potential to be significantly affected by congestion due to physical constraints or delays resulting from the alternatives. Staff also evaluated beneficial effects associated with project alternatives, including improved access, reduced delays and improved safety.

2.6 Coordination

Early coordination with public services occurred to obtain information on the affected environment. See the references list for records of personal communications. For impact analysis, coordination occurred with the authors of the Historic, Neighborhoods and Populations, Parks and Recreation, Transportation, and Acquisitions technical reports. Review of the Historic Built Environment, Neighborhoods and Parks reports ensured that any public services resources that are also categorized as a historic resource, neighborhood resource or park would be evaluated consistently.

Coordination occurred with the public services as indicated in the references section. Representatives of public services were asked questions similar to those below:

- How do you handle construction detours and changes in access routes?
- Given the level of detail available for the alternative transit and roadway options, what features may be problematic for the mobile portion of your service?
- Which, if any, intersections or road segments could cause detrimental delay to the mobile portion of your service?
- Are there reasonable alternate routes for mobile services? What kinds of effects would using these have?



- Primary API
- Secondary API

Exhibit 2-1. Area of Potential Impact



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3. Affected Environment

3.1 Introduction

This section provides an overview of the public services and service providers within the region and within the API. Exhibit 3-1 shows the specific locations of services that are either within the primary API or that serve population within the primary API.

3.2 Regional Conditions

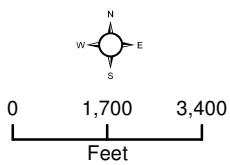
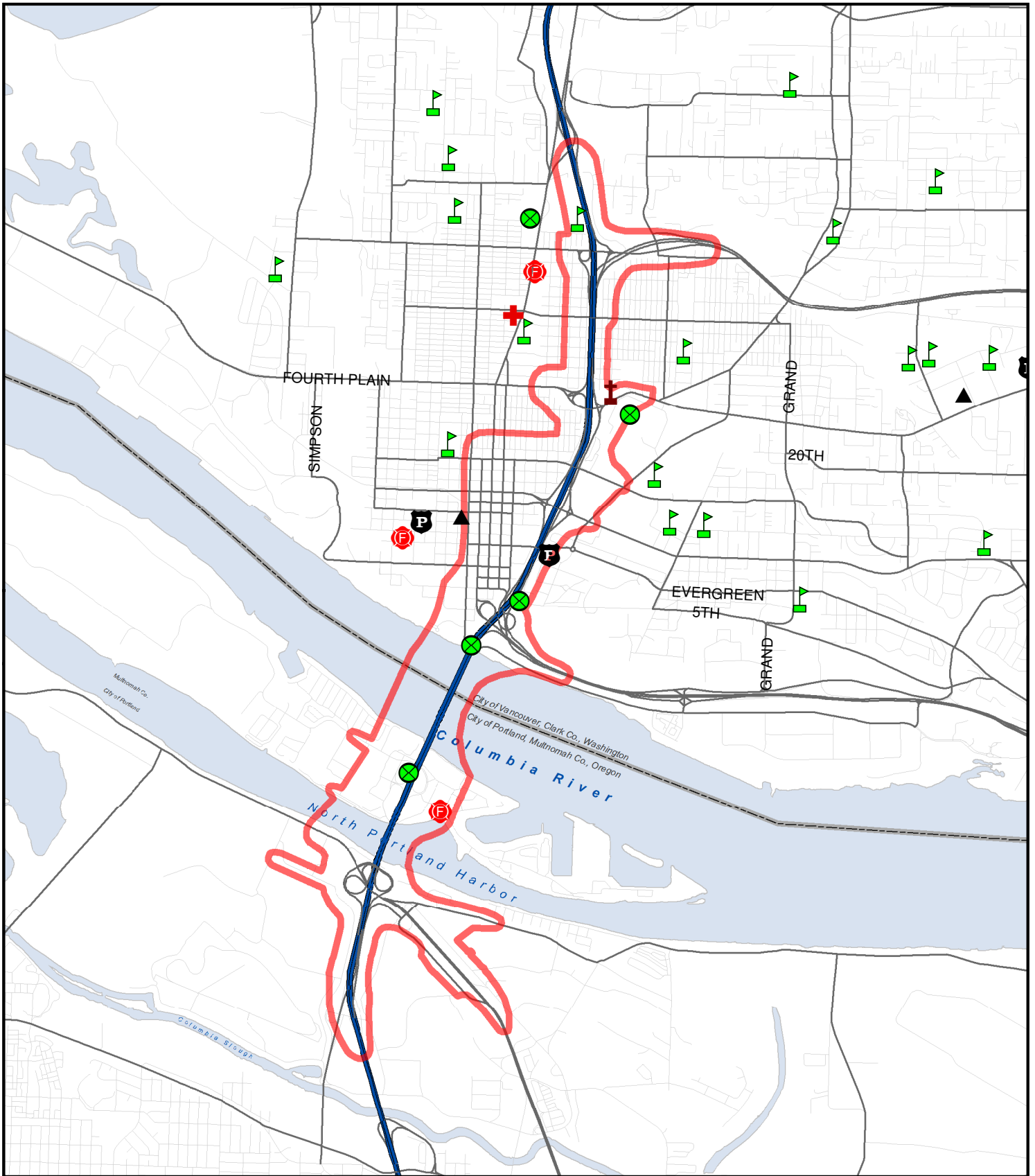
3.2.1 Fire and Life Safety

3.2.1.1 City of Portland

Portland Fire & Rescue (PF&R) provides fire suppression and emergency medical services within the city of Portland, which incorporates approximately 149.5 square miles and a population of 533,492, as of 2004 (US Census Bureau, date unknown). PF&R maintains intergovernmental agreements with all adjacent jurisdictions, such as the City of Vancouver, for backup emergency responses. Critical north-south emergency alternate access routes within or in proximity to the secondary API include N Interstate Avenue to the west of I-5 and NE Vancouver Avenue, NE Williams Avenue and NE Martin Luther King, Jr. Boulevard to the east of I-5. Fire and rescue emergency responses for fiscal year 2003 – 2004 included 2,528 fire, 38,929 emergency medical services, and 19,215 other responses. Ninety percent of all fire and medical emergency response times for 2004 were within 7.55 minutes (Bunster 2005; COP F&R 2004).

3.2.1.2 City of Vancouver

The City of Vancouver Fire Department (COV FD) provides fire suppression and emergency medical services for the city of Vancouver, which incorporates approximately 43 square miles and a population of 143,560 (US Census Bureau 2000b). The agency maintains intergovernmental agreements with adjacent jurisdictions (e.g., City of Portland) for emergency backup responses. Critical north-south emergency alternate access routes within or near Vancouver's portion of the secondary API include Main Street/SR 99 to the west of I-5, and Fort Vancouver Way and P Street to the east of I-5 (Walker 2005). Fire and rescue emergency responses for 2004 included 3,529 fire and 16,625 emergency medical services (COV FD 2005). The average response time for fire-related emergencies for 2004 was 6 minutes and 46 seconds. The average response time for emergency medical services was 4 minutes and 39 seconds (Walker 2005).











-  School
-  Medical Center
-  Police Station
-  Public Service
-  Post Office
-  Fire Station
-  Cemetery
-  Primary API

Exhibit 3-1. Public Services
Public Services Within or Serving
the Primary API



3.2.1.3 Clark County

The Clark County Fire Marshal's Office (CCFM) provides fire suppression and emergency medical services for all unincorporated portions of Clark County, Washington. It also provides contracted fire and emergency medical services to each of the cities within the county, with the exceptions of Vancouver and Camas. Contracted cities include Battle Ground, La Center, Ridgefield, Washougal, a portion of Woodland, and Yacolt. Including these cities, the CCFM serves 574 square miles and 221,261 individuals. Intergovernmental agreements for emergency backup responses are maintained between the county and all adjacent jurisdictions (e.g., City of Vancouver) (Dunaway 2005). Critical north-south emergency alternate access routes within or near the county's portion of the API are located within Fire District No. 6 and include NW Hazel Dell Avenue to the west of I-5 and I-205 and SR 99 to the east of I-5 (Cline 2005). The district's emergency responses for 2004 included 712 fire-related and 4,172 emergency medical services or other (Edwards 2005). Ninety-two percent of all fire and medical emergency response times for 2004 were within 6 minutes (Cline 2005).

3.2.2 Law Enforcement

3.2.2.1 City of Portland

One Portland Police Bureau Precinct provides service in the primary and secondary APIs. The Portland Police Bureau's North Precinct (the precinct) is bounded primarily by the Columbia River to the north, the Willamette River to the west I-84 to the south, the eastern city boundary to the east; however, it also serves the area located directly opposite the North Portland peninsula, on the southwest side of the Willamette River (e.g., Linnton and Forest Park). Intergovernmental agreements with adjacent jurisdictions, such as the City of Vancouver, are maintained for emergency backup responses (Hendrix 2005). The critical north-south emergency alternate access routes within or near the precinct's portion of the API include N Interstate, N Denver, and N Greeley Avenues (Boeglin 2005).

3.2.2.2 Oregon State Police

The Oregon State Police Bureau (OSP) provides law enforcement services along all of Oregon's state and interstate roadways, including the section of I-5 located within the Oregon portion of the primary and secondary APIs. The OSP serves all 3,641,056 Oregon residents, based on the 2004 US Census Population estimates, within a service area of 95,997 square miles (US Census Bureau 2005). The agency monitors and patrols approximately 65,861 vehicle miles statewide (ODOT date unknown) and 170.05 vehicle miles in Multnomah County (ODOT 2005). The OSP maintains intergovernmental agreements with adjacent jurisdictions for emergency backup responses, including Clark County and the WSP; however, no such contract currently exists between OSP and the City of Vancouver. Efforts to secure such an agreement are currently under way (Dokken 2005). The agency has no pre-determined critical north-south emergency alternate access route through the APIs though they have no alternative to the I-5 bridges to/from Hayden Island and across the Columbia River. According to an agency source (Drew 2005), "the [Oregon] State Police take whatever routes the Oregon Department of Transportation (ODOT) tells them to take." Based upon discussions with other law enforcement agencies serving the area, the alternate access routes most likely to serve as detours along the Portland portion of the secondary API include N Interstate, N Denver, and N Greeley Avenues to the west of I-5, and NE Martin Luther King, Jr. Boulevard, N Williams Avenue and N Vancouver Avenue to the east of I-5. The OSP 2004 person and property crime incident responses were 891 and 8,029, respectively.

Reported offenses for 2003 include 41,115 person, 246,011 property and 165,085 behavioral offenses statewide (Bock 2003).

3.2.2.3 City of Vancouver

The Vancouver Police Department (VPD) West Precinct (the precinct) provides law enforcement services for that portion of the city of Vancouver located west of NE Andresen Road (COV 2005). The number of residents within this area is approximately 55,000 (Wallace 2005). The VPD maintains intergovernmental agreements with the City of Portland, Clark County and Washington State for emergency backup responses. The critical north-south emergency alternate access routes within, or in proximity to, the Washington portion of the APIs include Main Street/SR 99 to the west of I-5, and Fort Vancouver Way and P Street to the east of I-5. SR 500 provides east-west connectivity to/from I-205, which provides alternate north-south access through the city (Harris 2005).

3.2.2.4 Washington State

The Washington State Patrol (WSP) provides law enforcement services along all state and interstate rights-of-way within Washington. The Vancouver Detachment of the WSP's District 5 (the district) serves I-5 within the Washington portions of the APIs. The agency's Vancouver Detachment is responsible for patrolling 124 miles of state highway in Clark County and provides law enforcement services to a population of 337,110 (WSP 2004). According to agency sources (Linn 2005), the WSP does have intergovernmental agreements for emergency backup responses with abutting city and county jurisdictions within the state of Washington; however, it does not maintain similar contracts with Oregon law enforcement agencies. When necessary during police activity, the agency does use the I-5 bridges. The alternate access route most likely to serve as the agency's I-5 detour is SR 99. This route parallels I-5, running west of the highway south of NE Hazel Dell Avenue, and crossing east of the highway to the north, although near the river there is no alternate route. The average emergency response time for 2004 was approximately 10 minutes (Linn 2005). The District 5 2004 traffic statistics include 95,486 violation contacts and 48,756 issued citations statewide (WSP 2005).

The Portland Police Bureau's Northeast Precinct (the precinct) is bounded by the Columbia River to the north, I-5 to the west, I-84 and NE Sandy Boulevard to the south, and I-205 to the east. The precinct incorporates approximately 20.7 square miles and serves a population of 87,448 (2000 estimate) (COP PB 2005). Intergovernmental agreements with adjacent jurisdictions (e.g., City of Vancouver) are maintained for emergency backup responses (Hendrix 2005). The critical north-south emergency alternate access routes within, or in proximity to, the precinct's portion of the API are NE Martin Luther King, Jr. Boulevard, N Williams Avenue and N Vancouver Avenue (Boeglin 2005). Person and property crime incident responses for 2004 were 891 and 8,029, respectively (COP PB 2005).

3.2.3 Medical Centers

Several hospitals provide hospital and emergency medical services to populations within the primary or secondary APIs. Portland facilities include Legacy Emanuel Hospital and Health Center and Kaiser Permanente, both west of I-5 and south of Columbia Boulevard. Vancouver facilities include Southwest Washington Medical Center in eastern Vancouver, Legacy Salmon Creek at the intersection of I-5 and I-205, Southwest Washington Memorial Hospital and Urgent Care Center on Main Street, and the Clark County Center for Community Health on the Vancouver Campus of the Portland Veterans Administration Hospital adjacent to I-5.

3.2.4 Public Schools

3.2.4.1 City of Portland Schools

With a student enrollment of approximately 47,656, Portland Public Schools is the largest school district in Oregon. The district includes 59 elementary schools, 17 middle schools, 10 high schools, and a number of alternative schools and special programs. Four Portland schools serve areas within the primary API, Woodlawn Elementary, Chief Joseph Elementary, Ockley Green Middle School, and Jefferson High School (Portland Public Schools, 2004 and 2005). None of the City of Portland School facilities are near areas that would be directly impacted by the project.

3.2.4.2 Vancouver Public Schools and Other Colleges

In 2003 the Vancouver School District (VSD) enrollment totaled 22,279 students in its 21 elementary schools, seven middle schools, six high schools and special programs (VSD 2006). There are 17 VSD schools or other facilities within or directly adjacent to the secondary API. Six schools and three other facilities are within or serve the primary API.

The VSD transportation department is responsible for transporting 11,000 students on a daily basis, and has a fleet of 130 buses traveling 590 school bus routes (VSD 2006). The district covers an area of approximately 58 square miles.

Clark College, located north of Fort Vancouver, just east of I-5, is a private two-year junior college offering a wide range of courses from high school equivalency programs and continuing education to technical certificate programs for the workforce. Enrollment in fall of 2006 was 12,785 students (Clark College 2006).

3.2.4.3 State-funded Schools for the Deaf and Blind

The Washington State Schools for the Blind and the Deaf are located near the project area. The Washington State School for the Blind is at 2214 E 13th Street near Mill Plain Boulevard and E Reserve Street, serves as “a statewide demonstration and resource center and provide[s] direct and indirect services to students both on campus and in...children’s local communities” (Washington State School for the Blind 2008). The School for the Blind provides mobility classes with instruction on crossing streets, business area travel skills, and bus travel.

The Washington State School for the Deaf is at 611 Grand Boulevard, at Grand and Evergreen, and attempts to address the needs to deaf and hard of hearing students throughout the state “by providing instructional services, partnering with parents and other agencies for systemic, integrated services to improve learning outcomes regardless of where the student attends school” (Washington State School for the Deaf 2008).

Though both schools are located outside of the primary API, they are addressed in this technical report because the communities that they serve require special consideration in the designing of transportation facilities.

3.2.4.4 Ridgefield School District

The small portion at the north end of the secondary API that is not served by Vancouver School District is served by Ridgefield School District (RSD). RSD includes South Ridge and Union Ridge Elementary Schools, View Ridge Middle School, and Ridgefield High School (RSD 2005). None of the Ridgefield School District facilities are near areas that would be directly impacted by the project.

3.2.5 Solid Waste Management

3.2.5.1 City of Portland

Garbage is collected in the city of Portland by several private collection companies. Two public transfer facilities are operated by the Metro Regional Government (Metro). The Metro Central transfer station is located in northwest Portland, approximately one mile southeast of where the secondary API meets the Willamette River. The Metro South transfer station is located in Oregon City, approximately 15 miles south of the secondary API. Metro holds a 20-year contract with the Columbia Ridge Landfill in Arlington, Oregon to receive mixed waste from these two transfer facilities (Metro 2004; Metro 2005a). Many other privately owned landfill facilities throughout the state of Oregon accept waste from within the Metro region (Metro 2005b).

3.2.5.2 City of Vancouver and Clark County

Garbage collected in Vancouver and Clark County is transferred at one of two transfer stations, then shipped on the Columbia River from the Port of Vancouver to the Port of Morrow, where containers are unloaded and trucked to the Finley Butte Landfill in Boardman, Oregon (CCPW 2005; Waste Management Landfill Group date unknown).

3.2.6 U.S. Postal Service

Four U.S. Post Office locations are located within the secondary API, and one is within downtown Vancouver in the primary API.

3.2.7 Cemeteries

There are several small cemeteries within the Portland portion of the secondary API, but none within the Portland portion of the primary API.

The City of Vancouver owns and manages two public cemeteries within or adjacent to the secondary API. Old Hill Cemetery is at the corner of E Mill Plain Boulevard and N Grand Boulevard. Park Hill Cemetery is at 5915 E Mill Plain Boulevard.

Additional cemeteries in the secondary API include: Post Military Cemetery adjacent to I-5, north of the Fourth Plain and Mother Joseph Catholic Cemetery just to the east of the Post Cemetery; Clark County Poor Farm Cemetery in the vicinity of Hazel Dell and NE 19th Avenue; Goddard (Old Salmon Creek United Methodist) Cemetery; St. Johns Lutheran Cemetery (both near NE 112th Street and NE 10 Avenue); Manor - Wilson Bridge Cemetery; and Memory Memorial Cemetery (both near NE 72nd Avenue and NE 144th Street).

3.3 Conditions within the API

3.3.1 Oregon Mainland

Exhibit 3-3 shows the locations of public services on the Oregon mainland and on Hayden Island.

3.3.1.1 Fire and Life Safety

Fire and life safety services in North Portland within the Primary API are provided by the City of Portland Fire and Life Safety Station 17 located on Hayden Island. Details for Station 17 are provided in Section 3.3.2.1 for Hayden Island.

3.3.1.2 Law Enforcement

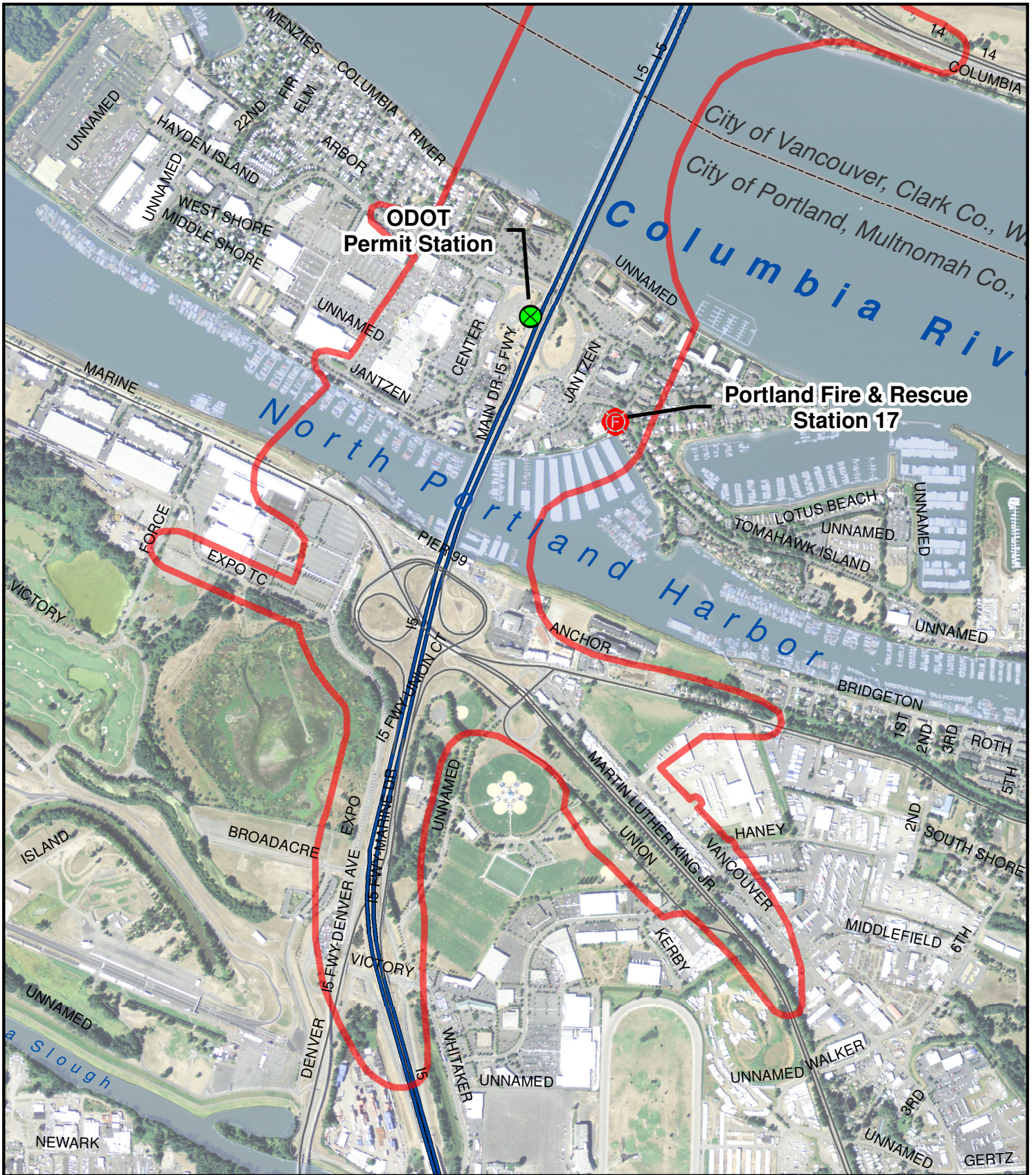
Law enforcement services within the primary API in North Portland are provided by the City of Portland Police Bureau's North Precinct. Exhibit 3-2 shows the location of law enforcement facilities in North Portland.

Exhibit 3-2. Law Enforcement Locations in North Portland

Precinct	Location	Critical Emergency Access Routes	Backup Response Precincts
City of Portland Police Bureau			
North Precinct	449 NE Emerson Street Portland	N Interstate Avenue, N Denver Avenue, NE MLK Jr. Boulevard, and N Greeley Avenue; I-5 is the only critical access route to/from Hayden Island.	All adjacent jurisdictions

3.3.1.3 Medical Centers

There are no medical centers within the Primary API in North Portland.



	<ul style="list-style-type: none"> School Police Station Post Office Cemetery 	<ul style="list-style-type: none"> Medical Center Public Service Fire Station Primary API 	<p>Exhibit 3-3. Public Services Oregon Mainland and Hayden Island</p>
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3.3.1.4 Public Schools

Portland Public Schools operates four public schools that serve the primary API, as identified in Exhibit 3-4. Only a very small portion of land within the primary API falls within the service boundaries of these schools.

Exhibit 3-4. Schools Serving the Primary API in North Portland

School	Location	2006 Enrollment ^a
Portland		
Woodlawn Elementary (PK – 6th)	7200 NE 11th Avenue	450
Chief Joseph Elementary (PK – 5th)	2409 N Saratoga Street	359
Ockley Green Middle School (K-8th)	6031 N Montana Avenue	442
Jefferson High School	5210 N Kerby Avenue	661

a Portland Public Schools (2004 and 2005).

3.3.1.5 Solid Waste Management

There are no transfer stations or solid waste disposal facilities within the primary API in North Portland.

3.3.1.6 U.S. Postal Service

There are no U.S. Post Office locations within the primary API in North Portland.

3.3.1.7 Cemeteries

There are no cemetery locations within the primary API in North Portland.

3.3.2 Hayden Island

3.3.2.1 Fire and Life Safety

One City of Portland Fire and Rescue Station is located on Hayden Island and serves both Hayden Island and North Portland within the Primary API. Exhibit 3-5 provides details about location and emergency routes.

Exhibit 3-5. Fire and Life Safety Locations North Portland

Agency	Location	Critical Emergency Access Routes	Alternate Agency
Portland Fire & Rescue Station 17	848 N Tomahawk Dr, Hayden Island	N Interstate Avenue, N Denver Avenue, and NE MLK Jr. Boulevard, N Tomahawk Island; I-5 is the only critical access route to/from Hayden Island.	All adjacent jurisdictions

3.3.2.2 Law Enforcement

Law enforcement services within the primary API on Hayden Island are provided by the City of Portland Police Bureau's North precinct. Exhibit 3-6 shows the location of law enforcement facilities for Hayden Island.

Exhibit 3-6. Law Enforcement Services for Hayden Island

Precinct	Location	Critical Emergency Access Routes	Backup Response Precincts
City of Portland Police Bureau			
North Precinct	449 NE Emerson Street, Portland	N Interstate Avenue, N Denver Avenue, NE MLK Jr. Boulevard, and N Greeley Avenue; I-5 is the only critical access route to/from Hayden Island.	All adjacent jurisdictions

3.3.2.3 Medical Centers

There are no medical centers within the Primary API on Hayden Island.

3.3.2.4 Public Schools

There are no schools on Hayden Island. Students living on Hayden Island are served by Portland Public Schools in North Portland.

3.3.2.5 Solid Waste Management

There are no transfer stations or solid waste disposal facilities within the primary API on Hayden Island.

3.3.2.6 U.S. Postal Service

There are no U.S. Post Office locations within the primary API on Hayden Island.

3.3.2.7 Cemeteries

There are no cemetery locations within the primary API on Hayden Island.

3.3.2.8 Other Facilities

Although not originally considered in the definition of public services for the scope of this report, some resources observed in the study area did not readily fall into other discipline categories and they were added to this report. The ODOT Permit Station and Field Office on Hayden Island is one of those resources. The Permit Station is located immediately to the west of I-5 within the Hayden Island interchange.

3.3.3 Vancouver (Downtown and Upper Vancouver)

Exhibit 3-9 shows the location of public services within Vancouver.

3.3.3.1 Fire and Life Safety

Two fire departments are either within or serve the primary API in Vancouver (Exhibit 3-7). In a personal communication, Deputy Chief Tom Miletich noted that the Vancouver Fire Department plans to relocate both Station 1 in downtown Vancouver and Station 2 at East 37th and Main Streets. Plans are not finalized at this time, but the Department is looking at two different areas.

1. For the Downtown Station, the area of interest is near 16th and Main Streets, with the intention of being more centrally located in downtown, having better east-west access, and still retaining good access to the Port of Vancouver.
2. For the Westside Station, the area of interest is outside of the primary API at the intersection of 39th and Kaufmann (Miletich 2007). Clark County Fire provides back up service to the primary API.

Exhibit 3-7. Fire and Life Safety Locations in Vancouver

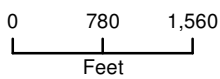
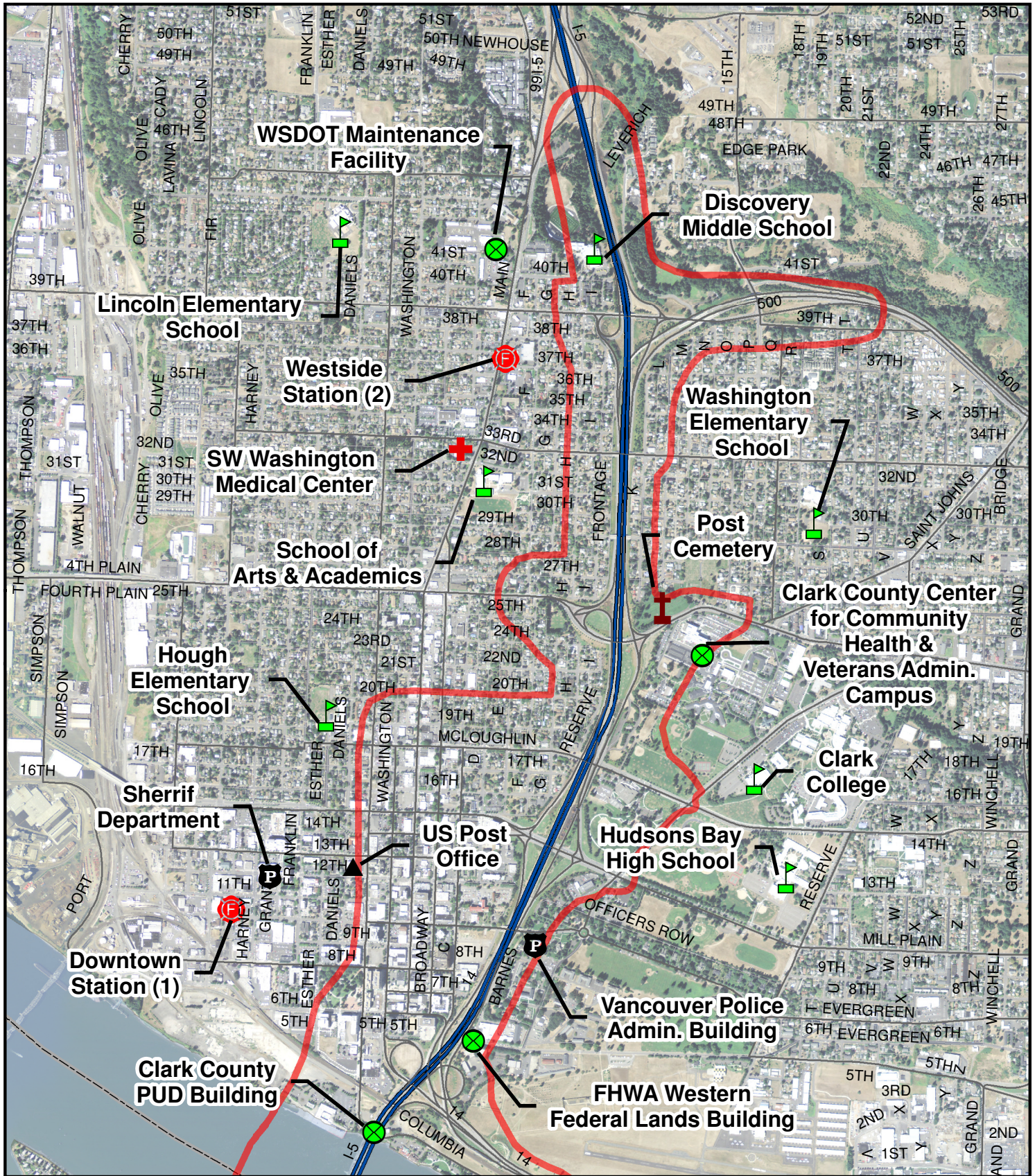
Agency	Location	Critical Emergency Access Routes	Alternate Agency
Vancouver Fire Department Downtown Station (1)	900 W Evergreen Street Vancouver	Main Street/SR 99, Fort Vancouver Way and P Street	All adjacent jurisdictions
Vancouver Fire Department Westside Station (2)	400 E 37th Street Vancouver	Columbia Street, 39th Street	All adjacent jurisdictions
Clark County Fire Marshal (District 6)	8800 NE Hazel Dell Avenue Vancouver	I-205, SR 99 and NW Hazel Dell Avenue	All adjacent jurisdictions

3.3.3.2 Law Enforcement

Law enforcement services within the primary API are provided by the City of Vancouver Police Administration and Traffic Office and the West Precinct and by the Clark County Sheriff's Office. Exhibit 3-8 shows the locations of law enforcement facilities in Vancouver. In a personal communication, Sergeant Wayne Reynolds noted that the Vancouver Police Department is planning to renovate the West Precinct. Vancouver Police also uses a portion of the WSDOT maintenance facility on Main Street for officer training operations. It is possible that the training operations would be relocated to the West Precinct with the remodel, but plans are unclear at this time. The Administration and Traffic Office parking lot adjacent to I-5 contains fuel pumps that serve all officers stationed at the administration office as well as impound vehicle storage and large operations vehicle storage (Reynolds 2007; CCSO 2004).

Exhibit 3-8. Law Enforcement Location in Vancouver

Precinct	Location	Critical Emergency Access Routes	Backup Response Precincts
City of Vancouver Police Department			
Police Administration and Traffic Office	605 E Evergreen Street Vancouver	None	Clark County and Washington State Police
West Precinct	2800 NE Stapleton Road Vancouver	Main Street/SR 99, Fort Vancouver Way, P Street, SR 500 to I-205	Clark County and Washington State Police
Clark County Sheriff's Office	707 W 13th Street Vancouver	NW Fruit Valley Road, NE Hazel Dell Road, NE Street Johns Boulevard, and NE Andresen Road (SR 500)	All adjacent jurisdictions











-  School
-  Medical Center
-  Police Station
-  Public Service
-  Post Office
-  Fire Station
-  Cemetery
-  Primary API

Exhibit 3-9. Public Services
Downtown and Upper
Vancouver



3.3.3.3 Medical Centers

Two medical centers provide medical services in Vancouver in the primary API. The facilities include the Clark County Center of Community Health (Veterans Administration - Vancouver Campus) and the Southwest Washington Memorial Hospital and Urgent Care Center (Exhibit 3-10). In personal communications with representatives of City of Vancouver Fire and Police departments, fire and police services rarely, if ever, bring patients to this urgent care center (Reynolds 2007, Miletich 2007).

Exhibit 3-10. Medical Centers in Vancouver

Hospital/Clinic	Location	Critical Care Services	Emergency Facility
Vancouver Hospitals			
SW Washington Memorial Health Center & Memorial Urgent Care	3400 Main Street	Urgent Care	No
Clark County Center for Community Health (on Veterans Administration-Vancouver Campus)	1601 E Fourth Plain Boulevard	None	No

3.3.3.4 Public Schools and Other School Facilities

Several school facilities serve the population within the primary API in Vancouver, but only Discovery Middle School and Kiggins Bowl and recreation facilities for Clark College are located within the API (Exhibit 3-11). Vancouver's Hudson's Bay High School is the public high school for the entire primary API within Vancouver.

Exhibit 3-11. Vancouver Schools and Facilities Serving the Primary API

School	Location
Hudson's Bay High School	1206 E Reserve Street
Harney Elementary School	3212 E Evergreen Boulevard
Hough Elementary School	1900 Daniels Street
Lincoln Elementary School	4200 Daniels Street
Washington Elementary School	2908 S Street
Discovery Middle School	800 E 40th Street
Other Facilities	
Vancouver School of Arts and Academics (6-12)	3101 Main Street
Clark College	1800 E McLoughlin Boulevard
Washington State School for the Blind	2214 E 13th Street
Washington State School for the Deaf	611 Grand Boulevard
Kiggins Bowl Stadium (at Discovery)	40th and H Streets

The Clark College Athletic Annex and Recreational Fields are located on the east side of I-5 north of McLoughlin. The recreation fields are a 13-acre park owned by Clark College, but the softball field, tennis courts, and open fields are open to the public from 7 a.m. to dusk. The site facilities include sports fields for the College and the public, batting cages, and benches. The

Athletic Annex, not open to the public, includes surface parking and a small building that includes bathrooms and office space used for equipment storage.

The Kiggins Bowl Sports Field/Stadium is a 3-acre sports venue adjacent to Discovery Middle School west of I-5 and north of 39th Street. The facility is owned and maintained by the Vancouver School District, but is open to the public during non-school hours for approved activities. Site facilities include natural area and trails, as well as a sports fields and track, including an artificial turf soccer/football field known as Kiggins Field. The trail that travels through the site and past Discovery Middle School is a spur that connects the Lincoln Neighborhood to the Burnt Bridge Creek portion of the Discovery Trail.

3.3.3.5 Solid Waste Management

There are no transfer stations or solid waste disposal facilities within the primary API in Vancouver.

3.3.3.6 U.S. Postal Service

The Downtown Vancouver U.S. Post Office is located within the primary API at 1211 Daniels Street (U.S. Postal Service 2005).

3.3.3.7 Cemeteries

The Post Cemetery, a military facility adjacent to I-5, and Mother Joseph Catholic Cemetery (formerly St. James Acres) in the vicinity of East 27th and L Streets are located within the primary API in Vancouver.

3.3.3.8 Other Facilities

Although not originally considered in the definition of public services for the scope of this report, some resources observed in the study area did not readily fall into other discipline categories and they were added to this report. Within Vancouver, the Clark Public Utilities District storage and administration building immediately east of the existing I-5 bridge abutment on the north bank of the Columbia River and the FHWA Western Federal Lands building immediately east of I-5 and north of Fort Vancouver were both added to this report and are evaluated for impacts from the CRC project.

The Clark Public Utilities District storage and administration building functions as an information center and houses energy conservation staff and is not part of the utility distribution system.

The FHWA Western Federal Lands building houses offices serving the needs of Oregon, Washington, Idaho, Montana, Alaska, and the Yellowstone and Grand Teton National Parks in Wyoming. Western Federal Lands administers the surveying, designing and constructing of forest highway system roads, parkways and park roads, Indian reservation roads, defense access roads, and other Federal lands roads. Western Federal Lands also provides training, technology deployment, and engineering services.

4. Long-term Effects

4.1 Introduction

This chapter describes the long-term impacts to public services that would be expected from the LPA. The chapter analyzes both primary direct impacts (e.g., physical impacts to public service buildings or properties) and secondary direct impacts (e.g., increased travel times for delivering mobile services).

4.2 Primary, Direct Impacts

The majority of the public services considered in this report have no direct long-term impacts to any facilities. Services with no direct impacts include:

- Fire and Life Safety
- Law Enforcement
- Solid Waste Management
- Postal Service
- Cemeteries

The project would directly impact six public service facilities, one medical center property, two related to school sites and three non-categorized facilities.

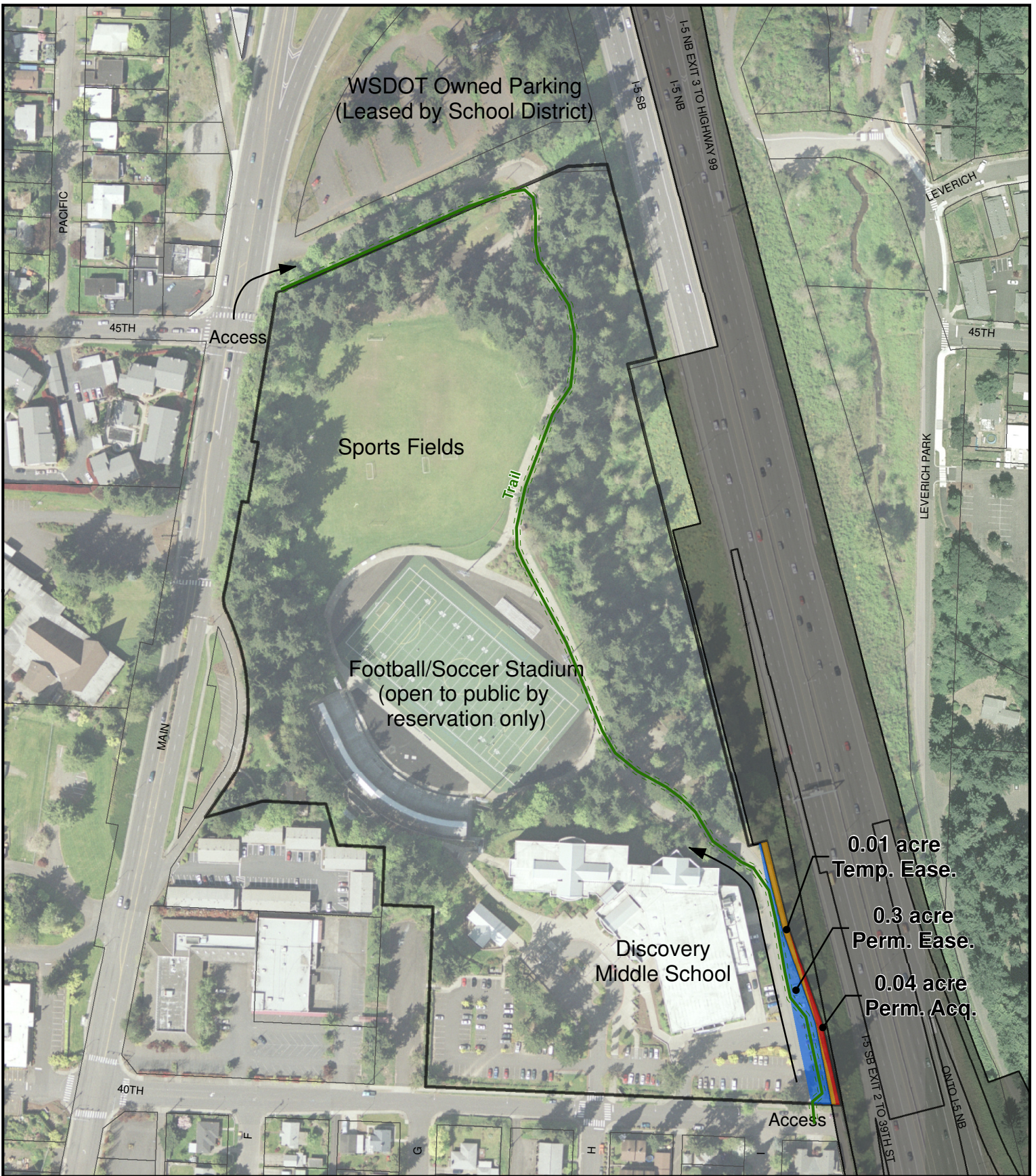
4.2.1 Medical Centers

There will be a small permanent right-of-way acquisition at the property that houses the Clark County Center of Community Health (Veterans Administration - Vancouver Campus). The impact includes less than one percent of the total property area and is limited to the far northwest corner of the site adjacent to East Fourth Plain Boulevard. A small amount of landscaping will be permanently lost, but there will be no impact to use of the site.

4.2.2 School Sites

Discovery Middle School and Kiggins Bowl located at the northern end of the project in the Lincoln Neighborhood would have minor impacts (Exhibit 4-1). No structures would be displaced, and long-term use of the site would not be affected by the construction of a retaining wall adjacent to the highway in the southwestern corner of the property. The retaining wall would require a permanent subsurface easement with some long-term surface use restrictions. Additionally, some use of the school circulation road between the school and I-5 may be restricted. For more information about construction plans and mitigation at this location, please refer to the Parks and Recreation Technical Report. This permanent impact would not affect any provision of school transportation.

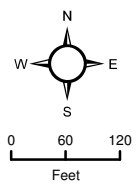
If the north legs of the SR 500 Interchange are deferred for later construction, then all property impacts at Discovery Middle School and Kiggins Bowl would be avoided.



0.01 acre
Temp. Ease.

0.3 acre
Perm. Ease.

0.04 acre
Perm. Acq.



Project Footprint	Acquisition Boundaries	Transit Right-of-Way
Affected Parcel	Roadway Right-of-Way	Transit Permanent Easement
Trail	Roadway Permanent Easement	Transit Temporary Easement
Tax Lots	Roadway Temporary Easement	

Exhibit 4-1. ROW Impacts at Discovery Middle School



The other school related site impact would occur at the Clark College Athletic Annex and Recreation Fields. Long-term impacts at the Clark College Athletic Annex include the displacement of the building and parking within the Annex area and displacement of some trees and landscaping to the south of the recreation fields near the Annex. The project would only impact the recreation fields by introducing an adjacent dissimilar use (the Clark College Park and Ride) which will be visually inconsistent with the area. This visual impact will require design treatments to blend with its surroundings, as discussed in the Visual and Aesthetics Technical Report. Clark College administration has requested a landscaped screening buffer between the new park and ride and the fields, and a pedestrian connection from the parking area to the fields (Exhibit 4-2). For more information about construction plans and mitigation at this location, please refer to the Parks and Recreation Technical Report.

4.2.3 Other Public Service Sites

Three non-categorized public service related facilities would be impacted by the project. The ODOT Permit Station and Field Office on Hayden Island would be permanently displaced by the LPA (Exhibit 4-3). The mainline of the new bridges would pass directly through the current location of the facility. It is undecided at this time where ODOT would relocate the functions of the station.

Within Vancouver, the FHWA Western Federal Lands office property immediately east of I-5 would have some right of way impacts. Acquisition along the west side of the parcel would impact approximately six marked parking stalls, adjacent asphalt and curbing, landscaping, parking area illumination, and an electronic swing gate (Exhibit 4-4). Adequate spacing between the structure and the new I-5 right-of-way line would remain for vehicles to access the rear of the property.

Lastly, the Clark Public Utilities District building located on the east side of the existing bridge abutment would be fully displaced. The building functions as an information center that houses energy conservation staff. It is not part of the utility distribution system. The LPA would locate bike and pedestrian access to the bridge where the Clark Public Utilities District building is now located (Exhibit 4-5).

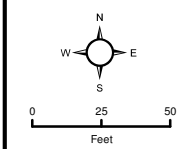


Exhibit 4-2. ROW Impacts at Clark College Recreation Fields

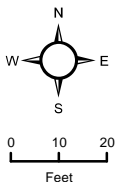
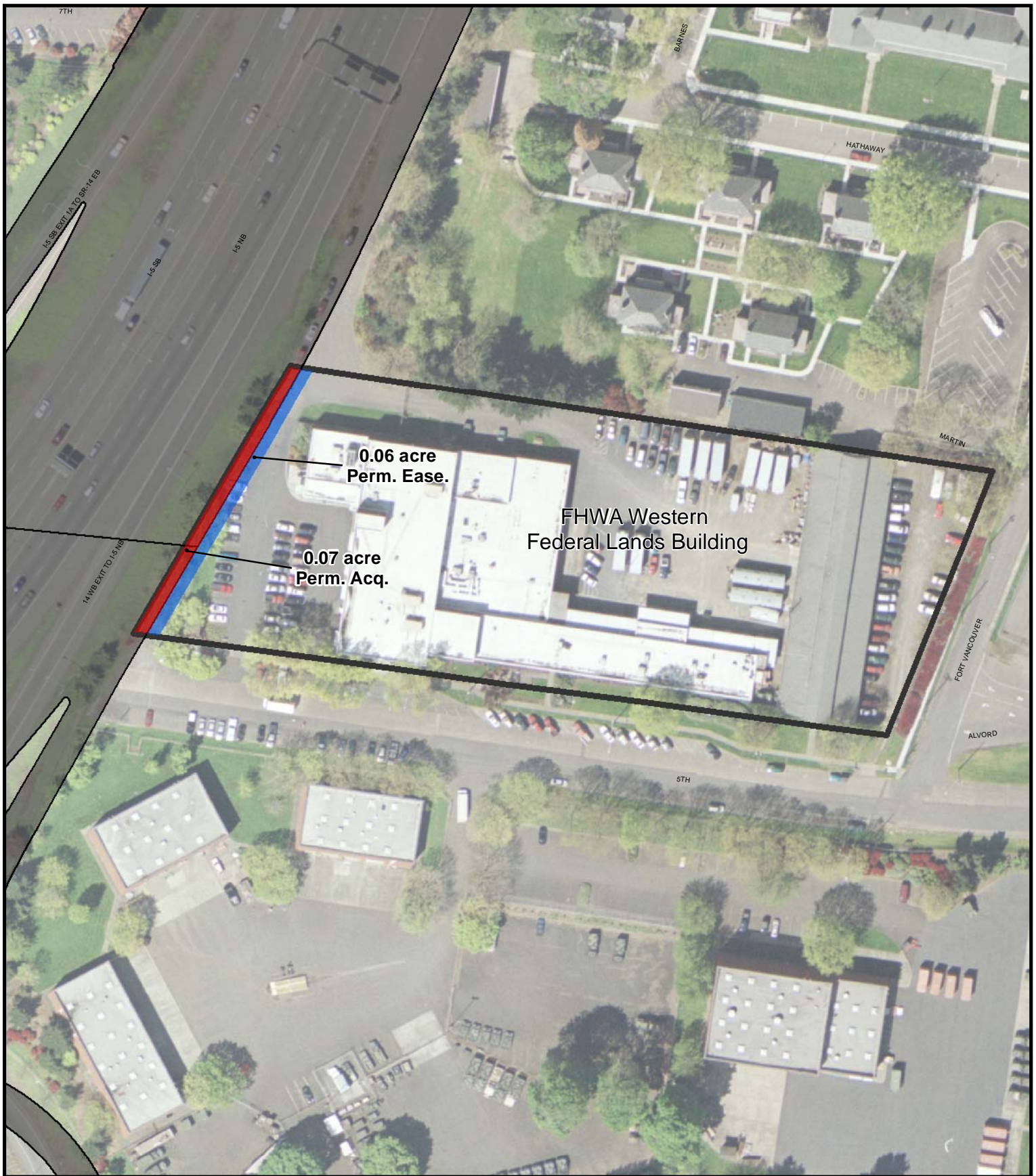




Exhibit 4-3. ROW impacts at ODOT Permit Station






Project Footprint	Acquisition Requirements	Transit Right-of-Way
Affected Parcel	Roadway Right-of-Way	Transit Permanent Easement
	Roadway Permanent Easement	Transit Temporary Easement
	Roadway Temporary Easement	



 Project Design Footprint
 Affected Parcel

Acquisition Boundaries

 Roadway Right-of-Way
 Roadway Permanent Easement
 Roadway Temporary Easement

 Transit Right-of-Way
 Transit Permanent Easement
 Transit Temporary Easement

Exhibit 4.4. ROW Impacts at FHWA Western Federal Lands Building



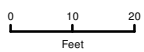
Note: Impacts to Old Apple Tree Park are shown on separate exhibit.



Clark PUD




**0.1 Acres
(3027 Sq. Ft.)**

**0.1 Acres
(2268 Sq. Ft.)**



 Project Footprint
 Affected Parcel

Acquisition Requirements

 Roadway Right-of-Way
 Roadway Permanent Easement
 Roadway Temporary Easement

 Transit Right-of-Way
 Transit Permanent Easement
 Transit Temporary Easement

Exhibit 4-5. ROW impacts at Clark PUD Building



4.3 Secondary, Direct Impacts

Two additional types of effects are considered including intersection performance at locations likely to affect the mobility of fire and life safety and law enforcement public services, and indirect land use changes that could potentially affect the demand for public services.

Public service agencies, including schools and emergency service providers that could be affected by indirect land use changes from the project plan for service based on forecast population and development patterns found in the long-range comprehensive plans of the jurisdictions they serve. The public services evaluate future population growth and calculate needed future service increases, such as increased numbers of police officers, new equipment, new station locations, or for schools, increased staff or bus services. Because the land use change anticipated from the project is not expected to create an unexpected increase in population, the project does not impact public services individual service plans for service levels. For more discussion of indirect effects from land use change resulting from the project, please refer to the Indirect Effects Technical Report.

In general the project would improve traffic conditions on the highway, thus response times for mobile public services relying on I-5 would not be adversely affected. Any impacts to local streets that affect the critical emergency access routes may have an effect on response times of public services. Emergency and police services reported use of specific roadways as emergency access routes as shown in Exhibit 4-6.

Exhibit 4-6. Mobile Public Service Critical Emergency Access Routes

Service	Critical Emergency Access Routes
North Precinct Portland Police	N Interstate Avenue, N Denver Avenue, NE MLK Jr. Boulevard and N Greeley Avenue; I-5 is the only critical access route to/from Hayden Island.
Portland Fire & Rescue Station 17	N Interstate Avenue, N Denver Avenue, and NE MLK Jr. Boulevard, N Tomahawk Island. Under LPA Option B I-5 is the only critical access route to/from Hayden Island. Option A adds a local bridge connection to the Oregon mainland.
Vancouver Fire Department Downtown Station (1)	Main Street/SR 99, Fort Vancouver Way and P Street
Vancouver Fire Department Westside Station (2)	Columbia Street, Main Street, 39th Street
Clark County Fire Marshal (District 6)	I-205, SR 99 and NW Hazel Dell Avenue
West Precinct City of Vancouver Police	Main Street/SR 99, Fort Vancouver Way, P Street, SR 500 to I-205
Clark County Sheriff's Office	NW Fruit Valley Road, NE Hazel Dell Road, NE St. Johns Boulevard, and NE Andresen Road (SR 500)

A total of 98 local street intersections were analyzed for current conditions (2005 data). For 2030 conditions, 111 intersections were analyzed for the No-Build, and 130 intersections were analyzed for the LPA, and LPA with highway phasing alternatives. Of the total study area intersections, 44 in Vancouver and 19 in Portland are also on the critical emergency access routes identified in Exhibit 4-6.

In Portland during the AM Peak, one intersection on critical access routes would not meet standards under the No-Build Alternative and one intersection would not meet standards under the LPA. One additional intersection would operate with high delay but perform no worse than No-Build. In the AM Peak in Portland, the LPA would have the same impacts to emergency

services as the No-Build. The LPA with highway phasing would have the same impacts as the LPA.

During the PM Peak in Portland, four intersections would not meet standards in the No-Build. With the LPA, no intersections would fail to meet standards and one would operate with high delay but perform no worse than No-Build. The LPA would have fewer impacts to emergency services than the No-Build. The LPA with highway phasing would have the same impacts as the LPA.

In Vancouver, during the AM Peak, six intersections would not meet standards under the No-Build. With the LPA one intersection would not meet standards and three would operate with high delay but perform no worse than No-Build. The LPA would have fewer impacts to emergency services than the No-Build. The LPA with highway phasing would have two intersections that would not meet standards and three that would operate with high delay but perform no worse than No-Build. The LPA with highway phasing would have greater impacts to emergency services than the LPA, but fewer than the No-Build.

During the PM Peak in Vancouver, six intersections would not meet standards in the No-Build. The LPA would have one intersection that does not meet standards and four that operate with high delay but perform no worse than No-Build. The LPA would have fewer impacts to emergency services than the No-Build. The LPA with highway phasing would have four intersections that do not meet standards and four that operate with high delay but perform no worse than No-Build. The LPA with highway phasing would have greater impacts to emergency services than the LPA and the No-Build.

In Vancouver, the streets with the most impacts are Main Street and 39th Street. During the AM and PM peaks, response times for mobile public services relying on Main Street or 39th Street as a critical access route could be negatively affected.

LPA Options A and B would have the same impacts to critical emergency access routes. However, LPA Option A has one additional beneficial effect. It would improve access between Hayden Island and the Oregon mainland with the addition of the local access bridge. During high traffic periods on I-5, emergency responders could choose to use the local access bridge rather than the I-5 access to the island. This is a benefit compared to both the No-Build condition and LPA Option B.

Whether a delay to an individual service trip would occur depends on many factors, including type and location of an emergency, traffic conditions on a given day, and whether emergency services have signal priority on a given traffic signal. Although there is a potential for delay to occur along Main Street or 39th Street, the project would create better local traffic conditions than would exist under the No-Build Alternative.

Emergency access to the transit guideway and bike/pedestrian paths on the lower decks of the bridge would be provided by the project design and would allow access for rescue trains and first responders.

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5. Temporary Effects

5.1 Introduction

This chapter describes the temporary impacts to public services that would be expected from construction of the project. The temporary regional and system-wide impacts are addressed first, followed by a discussion of impacts within the API.

The project may include the temporary effects listed below. Mitigation measures for these effects are discussed in Section 6 of this report.

- Temporary easements for construction staging areas. These temporary acquisitions would be returned to the landowner after construction is complete or purchased for transit-oriented development. The locations of staging areas are yet to be confirmed based on final engineering designs.
- 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.

5.2 Regional and System-wide Impacts

Increased delays and traffic on streets under construction may cause response time delays for mobile public services. Construction on bridge structures would cause delays for mobile services needing to access or leave Hayden Island.

When any of the primary emergency transportation routes identified in Section 3 would be partially or fully under construction for any part of the project, advance communication with the impacted public services would be necessary to prevent potential delays in response times.

5.3 Project Area Impacts

5.3.1 Oregon Mainland and Hayden Island

Temporary effects to public services on Hayden Island include temporary increased delays for the fire services stationed on Hayden Island which have to utilize I-5 to reach their service areas in North Portland. Other services, such as law enforcement, would also experience delays accessing Hayden Island from North Portland or Vancouver.

5.3.2 Vancouver (Downtown and Upper Vancouver)

Construction of the project would likely cause many temporary effects within Downtown and Upper Vancouver consistent with all large construction projects. Those effects with the greatest potential to affect public services are traffic delays and noise and vibration at schools. As discussed above, all temporary construction on emergency transportation routes may cause delays

in emergency services response times and must be communicated with those agencies in advance. Temporary construction noise and vibration may affect Discovery Middle School and the recreation fields at Clark College. Standard construction practices would minimize these impacts. Please see the Noise and Vibration Technical Report for more detail.

5.4 Impacts from Other Project Elements

5.4.1 Transit Maintenance Base Options

Because of the introduction of light rail into Vancouver, the existing Ruby Junction Maintenance Facility in Gresham, Oregon, would be expanded to support the new light rail service under the LPA. No public services facilities would be impacted by the expansion.

5.4.2 Tolling

As a part of the build alternatives, all motor vehicle users on the I-5 crossing would pay a toll. Open road tolling (ORT) technology would be used. ORT allows the collection of tolls without the use of lane dividing barriers or tollbooths. With ORT, users are able to drive through at highway speeds without having to slow down at barriers or to physically pay a toll. Full use of ORT eliminates the need for toll plazas.

Tolls would be collected through the use of transponders mounted within vehicles. Motorists would establish a pre-paid account for their transponder. For those vehicles without a transponder, license plate images would be scanned and users would be mailed a bill. Due to the added operational cost associated with license plate scanning and bill collection, vehicles without transponders would pay a higher toll rate than vehicles with transponders.

Potential effects to mobile services will be realized as decreases in congestion on and near the bridges result in faster travel times. This would potentially improve response times for emergency services that are required to use the bridge.

6. Proposed Mitigation for Adverse Effects

6.1 Introduction

The mitigation measures discussed below are presented in two sections – mitigation for permanent effects and mitigation for temporary effects. Within both sections these mitigation measures are organized by impact type.

6.2 Proposed Mitigation for Adverse Effects

There are three types of long-term adverse effects to public services: minor right-of-way acquisitions, full building displacement, and traffic impacts to mobile services. Potential mitigation for these impacts is described for each type of impact below.

6.2.1 Minor Right-of-Way Acquisition

Right-of-way purchased from public services property owners would be purchased for fair market value. For details refer to the Acquisitions Technical Report. No mitigation is proposed for minor right-of-way acquisitions that do not affect the current use of the property.

6.2.2 Full Displacement

The three public service properties being displaced by the project include the building and parking facilities at the Clark College Athletic Annex, the ODOT Permit Station and Field Office, and the Clark Public Utilities District administration building.

Clark College Recreational Fields and Athletic Annex would be impacted by the loss of the building used for recreation equipment storage and the surface parking for events provided on the site. Staff and decision makers from the CRC project, C-TRAN, the City of Vancouver, VCPRD, and Clark College are developing a plan for shared-use of the park and ride facility, allowing users of the athletic fields and the Community Center to the south to park in the new facility during non-peak commute hours. See the Parks and Recreation Technical Report for mitigation proposed to compensate for recreational losses from these impacts.

The ODOT Permit Station and Field Office is an ODOT facility. No mitigation for the loss of this building is proposed, and ODOT would determine where to move the functions of the permit station.

No mitigation beyond required acquisition procedures is recommended for the displacement of the Clark Public Utility District administration building.

6.2.3 Traffic Effects

Many of the intersections that do not meet standards as a result of the LPA are intersections (or corridors) for which the project team, in cooperation with sponsoring agencies, would develop mitigation strategies. Mitigation is only required for intersections operating below standards under the LPA or LPA Phase I that would otherwise meet standards with the No-Build Alternative. The data presented here show the preliminary findings before mitigation techniques have been employed. Mitigation strategies would include road widening and the acquisition of

new right-of-way only to mitigate cases of extreme delay, and only when no other mitigations would produce acceptable conditions. Certain mitigations would improve an intersection that is currently below standards, but these same mitigations would be ineffective for intersections with extreme delay.

6.3 Proposed Mitigation for Adverse Effects during Construction

For all temporary construction activities, detailed coordination about construction locations, and phasing must be provided to the appropriate parties at law enforcement and fire, emergency responder services, and school transportation services. Especially for the emergency responders, this coordination needs to include any temporary access restrictions to highway on-ramps and exits, and critical emergency access routes.

A pre-construction communications plan should be developed with all affected emergency response agencies detailing how detour and road closure information will be provided to the services. The potential for arranging for back-up aerial emergency service (on-call emergency helicopter service) to transport patients across the river during bridge construction should be evaluated prior to beginning construction. This would mitigate for highway delays, especially for emergency incidents on Hayden Island during bridge construction.

As emergency responders monitor response times during construction and unacceptable delays are found to occur due to construction, WSDOT and/or ODOT will meet with emergency service representatives to address construction concerns and develop solutions for better detour route communication.

In addition, where construction activity requires detours on routes typically used by the public to access public service locations (police and fire stations, hospitals, public schools, and post offices), detour signs would be provided.

7. Permits and Approvals

There are no federal, state, or local permits associated with public services.

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