INTERSTATE 5 COLUMBIA RIVER CROSSING

Acquisitions Technical Report

May 2008

Columbia River CROSSING

TO: Readers of the CRC Technical Reports

FROM: CRC Project Team

SUBJECT: Differences between CRC DEIS and Technical Reports

The I-5 Columbia River Crossing (CRC) Draft Environmental Impact Statement (DEIS) presents information summarized from numerous technical documents. Most of these documents are discipline-specific technical reports (e.g., archeology, noise and vibration, navigation, etc.). These reports include a detailed explanation of the data gathering and analytical methods used by each discipline team. The methodologies were reviewed by federal, state and local agencies before analysis began. The technical reports are longer and more detailed than the DEIS and should be referred to for information beyond that which is presented in the DEIS. For example, findings summarized in the DEIS are supported by analysis in the technical reports and their appendices.

The DEIS organizes the range of alternatives differently than the technical reports. Although the information contained in the DEIS was derived from the analyses documented in the technical reports, this information is organized differently in the DEIS than in the reports. The following explains these differences. The following details the significant differences between how alternatives are described, terminology, and how impacts are organized in the DEIS and in most technical reports so that readers of the DEIS can understand where to look for information in the technical reports. Some technical reports do not exhibit all these differences from the DEIS.

Difference #1: Description of Alternatives

The first difference readers of the technical reports are likely to discover is that the full alternatives are packaged differently than in the DEIS. The primary difference is that the DEIS includes all four transit terminus options (Kiggins Bowl, Lincoln, Clark College Minimum Operable Segment (MOS), and Mill Plain MOS) with each build alternative. In contrast, the alternatives in the technical reports assume a single transit terminus:

- Alternatives 2 and 3 both include the Kiggins Bowl terminus
- Alternatives 4 and 5 both include the Lincoln terminus

In the technical reports, the Clark College MOS and Mill Plain MOS are evaluated and discussed from the standpoint of how they would differ from the full-length Kiggins Bowl and Lincoln terminus options.

Difference #2: Terminology

Several elements of the project alternatives are described using different terms in the DEIS than in the technical reports. The following table shows the major differences in terminology.

DEIS terms	Technical report terms
Kiggins Bowl terminus	I-5 alignment
Lincoln terminus	Vancouver alignment
Efficient transit operations	Standard transit operations
Increased transit operations	Enhanced transit operations

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Difference #3: Analysis of Alternatives

The most significant difference between most of the technical reports and the DEIS is how each structures its discussion of impacts of the alternatives. Both the reports and the DEIS introduce long-term effects of the full alternatives first. However, the technical reports then discuss "segment-level options," "other project elements," and "system-level choices." The technical reports used segment-level analyses to focus on specific and consistent geographic regions. This enabled a robust analysis of the choices on Hayden Island, in downtown Vancouver, etc. The system-level analysis allowed for a comparative evaluation of major project components (replacement versus supplemental bridge, light rail versus bus rapid transit, etc). The key findings of these analyses are summarized in the DEIS; they are simply organized in only two general areas: impacts by each full alternative, and impacts of the individual "components" that comprise the alternatives (e.g. transit mode).

Difference #4: Updates

The draft technical reports were largely completed in late 2007. Some data in these reports have been updated since then and are reflected in the DEIS. However, not all changes have been incorporated into the technical reports. The DEIS reflects more recent public and agency input than is included in the technical reports. Some of the options and potential mitigation measures developed after the technical reports were drafted are included in the DEIS, but not in the technical reports. For example, Chapter 5 of the DEIS (Section 4(f) evaluation) includes a range of potential "minimization measures" that are being considered to reduce impacts to historic and public park and recreation resources. These are generally not included in the technical reports. Also, impacts related to the stacked transit/highway bridge (STHB) design for the replacement river crossing are not discussed in the individual technical reports, but are consolidated into a single technical memorandum.

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Cover Sheet

Interstate 5 Columbia River Crossing

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ACRONYMS

Acronym	Description
APE	Area of Potential Effect
API	Area of Potential Impact
BRT	Bus Rapid Transit
CFR	Code of Federal Regulations
CRC	Columbia River Crossing
DEIS	Draft Environmental Impact Statement
DSL	Oregon Department of State Lands
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
Ft	feet/foot
FTA	Federal Transit Administration
HCT	High-Capacity Transit
LRT	Light Rail Transit
Mi	mile
MP	Milepost
MOS	Minimum Operable Segment
NEPA	National Environmental Policy Act
OAR	Oregon Administrative Rule
ODOT	Oregon Department of Transportation
WSDOT	Washington State Department of Transportation

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1. Summary

1.1 Introduction

This report presents the evaluation of potential land acquisitions, building impacts, and relocations that would result from the proposed Interstate 5 (I-5) Columbia River Crossing (CRC) project alternatives. This report addresses the following questions, based on available conceptual designs:

- How much land and how many parcels would be acquired under each project alternative?
- How many building impacts would occur under each project alternative?
  - How many of the buildings impacted are businesses?
  - How many residential buildings would be impacted?
  - What are the other types of buildings that would be impacted (e.g., civic)?
- Are there comparable business and housing opportunities in the area to accommodate these businesses and/or households?

The analysis at this stage of the project is based on conceptual designs of a range of alternatives. This report identifies the likely impacts from those alternatives and identifies potential measures to reduce the impacts, including possible options for avoiding, minimizing or mitigating impacts. Following the analysis and findings described in this report, and following additional agency and public coordination and input, the project sponsors will select a preferred alternative. The project team will further design and evaluate that alternative, refining the impact analysis and further developing mitigation measures.

1.2 Description of the Alternatives

The alternatives being considered for the CRC project consist of a diverse range of highway, transit and other transportation choices. Some of these choices – such as the number of traffic lanes across the river – could affect transportation performance and impacts throughout the bridge influence area or beyond. These are referred to as "system-level choices." Other choices – such as whether to run high-capacity transit (HCT) on Washington Street or Washington and Broadway Streets – have little impact beyond the area immediately surrounding that proposed change and no measurable effect on regional impacts or performance. These are called "segment-level choices." This report discusses the impacts from both system- and segment-level choices, as well as "full alternatives." The full alternatives combine system-level and segment-level choices for highway, transit, pedestrian, and bicycle transportation. They are representative examples of how project elements may be combined. Other combinations of specific elements are possible. Analyzing the full alternatives allows us to understand the combined performance and impacts that would result from multimodal improvements spanning the bridge influence area.

Following are brief descriptions of the alternatives being evaluated in this report, which include:

- System-level choices,
- Segment-level choices, and
- Full alternatives.

1.2.1 System-Level Choices

System-level choices have potentially broad influence on the magnitude and type of benefits and impacts produced by this project. These options may influence physical or operational characteristics throughout the project area and can affect transportation and other elements outside the project corridor as well. The system-level choices include:

- River crossing type (replacement or supplemental)
- High-capacity transit mode (bus rapid transit or light rail transit)
- Tolling (no toll, I-5 only, I-5 and I-205, standard toll, higher toll)

This report compares replacement and supplemental river crossing options. A replacement river crossing would remove the existing highway bridge structures across the Columbia River and replace them with three new parallel structures – one for I-5 northbound traffic, another for I-5 southbound traffic, and a third for HCT, bicycles, and pedestrians. A supplemental river crossing would build a new bridge span downstream of the existing I-5 bridge. The new supplemental bridge would carry southbound I-5 traffic and HCT, while the existing I-5 bridge would carry northbound I-5 traffic, bicycles, and pedestrians. The replacement crossing would include three through-lanes and two auxiliary lanes for I-5 traffic in each direction. The supplemental crossing would include three through-lanes and one auxiliary lane in each direction.

Two types of HCT are being considered – bus rapid transit and light rail transit. Both would operate in an exclusive right-of-way through the project area, and are being evaluated for the same alignments and station locations. The HCT mode – LRT or BRT – is evaluated as a system-level choice. Alignment options and station locations are discussed as segment-level choices. BRT would use 60-foot or 80-foot long articulated buses in lanes separated from other traffic. LRT would use one- and two-car trains in an extension of the MAX line that currently ends at the Expo Center in Portland.

Under the efficient operating scenario, LRT trains would run at approximately 7.5 minute headways during the peak periods. BRT would run at headways between 2.5 and 10 minutes depending on the location in the corridor. BRT would need to run at more frequent headways to match the passenger-carrying capacity of the LRT trains. This report also evaluates performance and impacts for an increased operations scenario that would double the number of BRT vehicles or the number of LRT trains during the peak periods.

1.2.2 Segment-Level Choices

1.2.2.1 Transit Alignments

The transit alignment choices are organized into three corridor segments. Within each segment the alignment choices can be selected relatively independently of the choices in the other segments. These alignment variations generally do not affect overall system performance but could have important differences in the impacts and benefits that occur in each segment. The three segments are:

- Segment A1 – Delta Park to South Vancouver
- Segment A2 – South Vancouver to Mill Plain District
- Segment B – Mill Plain District to North Vancouver

In Segment A1 there are two general transit alignment options - offset from, or adjacent to, I-5. An offset HCT guideway would place HCT approximately 450 to 650 feet west of I-5 on Hayden Island. An adjacent HCT guideway across Hayden Island would locate HCT immediately west of I-5. The alignment of I-5, and thus the alignment of an adjacent HCT guideway, on Hayden Island would vary slightly depending upon the river crossing and highway alignment, whereas an offset HCT guideway would retain the same station location regardless of the I-5 bridge alignment.

HCT would touch down in downtown Vancouver at Sixth Street and Washington Street with a replacement river crossing. A supplemental crossing would push the touch down location north to Seventh Street. Once in downtown Vancouver, there are two alignment options for HCT – a two-way guideway on Washington Street or a couplet design that would place southbound HCT on Washington Street and northbound HCT on Broadway. Both options would have stations at Seventh Street, 12th Street, and at the Mill Plain Transit Center between 15th and 16th Streets.

From downtown Vancouver, HCT could either continue north on local streets or turn east and then north adjacent to I-5. Continuing north on local streets, HCT could either use a two-way guideway on Broadway or a couplet on Main Street and Broadway. At 29th Street, both of these options would merge to a two-way guideway on Main Street and end at the Lincoln Park and Ride located at the current WSDOT maintenance facility. Once out of downtown Vancouver, transit has two options if connecting to an I-5 alignment: head east on 16th Street and then through a new tunnel under I-5, or head east on McLoughlin Street and then through the existing underpass beneath I-5. With either option HCT would connect with the Clark College Park and Ride on the east side of I-5, then head north along I-5 to about SR 500 where it would cross back over I-5 to end at the Kiggins Bowl Park and Ride.

There is also an option, referred to as the minimum operable segments (MOS), which would end the HCT line at either the Mill Plain station or Clark College. The MOS options provide a lower cost, lower performance alternative in the event that the full-length HCT lines could not be funded in a single phase of construction and financing.

1.2.2.2 Highway and Bridge Alignments

This analysis divides the highway and bridge options into two corridor segments, including:

- Segment A – Delta Park to Mill Plain District
- Segment B – Mill Plain District to North Vancouver

Segment A has several independent highway and bridge alignment options. Differences in highway alignment in Segment B are caused by transit alignment, and are not treated as independent options.

There are two options for the replacement crossing – it could be located either upstream or downstream of the existing I-5 bridge. At the SR 14 interchange there are two basic configurations being considered. A traditional configuration would use ramps looping around both sides of the mainline to provide direct connection between I-5 and SR 14. A less traditional design could reduce right-of-way requirements by using a "left loop" that would stack both ramps on the west side of the I-5 mainline.

1.2.3 Full Alternatives

Full alternatives represent combinations of system-level and segment-level options. These alternatives have been assembled to represent the range of possibilities and total impacts at the project and regional level. Packaging different configurations of highway, transit, river crossing, tolling and other improvements into full alternatives allows project staff to evaluate comprehensive traffic and transit performance, environmental impacts and costs.

Exhibit 1-1 summarizes how the options discussed above have been packaged into representative full alternatives.

Exhibit 1-1. Full Alternatives

	Packaged Options				
Full Alternative	River Crossing Type	HCT Mode	Northern Transit Alignment	TDM/TSM Type	Tolling Method[a]
1	Existing	None	N/A	Existing	None
2	Replacement	BRT	I-5	Aggressive	Standard Rate
3	Replacement	LRT	I-5	Aggressive	Two options[b]
4	Supplemental	BRT	Vancouver	Very Aggressive	Higher rate
5	Supplemental	LRT	Vancouver	Very Aggressive	Higher rate

[a] In addition to different tolling rates, this report evaluates options that would toll only the I-5 river crossing and options that would toll both the I-5 and the I-205 crossings.

[b] Alternative 3 is evaluated with two different tolling scenarios, tolling and non-tolling.

Modeling software used to assess alternatives' performance does not distinguish between smaller details, such as most segment-level transit alignments. However, the geographic difference between the Vancouver and I-5 transit alignments is significant enough to warrant including this variable in the model. All alternatives include Transportation

Demand Management (TDM) and Transportation System Management (TSM) measures designed to improve efficient use of the transportation network and encourage alternative transportation options to commuters such as carpools, flexible work hours, and telecommuting. Alternatives 4 and 5 assume higher funding levels for some of these measures.

Alternative 1: The National Environmental Policy Act (NEPA) requires the evaluation of a No-Build or "No Action" alternative for comparison with the build alternatives. The No-Build analysis includes the same 2030 population and employment projections and the same reasonably foreseeable projects assumed in the build alternatives. It does not include any of the I-5 CRC related improvements. It provides a baseline for comparing the build alternatives, and for understanding what will happen without construction of the I-5 CRC project.

Alternative 2: This alternative would replace the existing I-5 bridge with three new bridge structures downstream of the existing bridge. These new bridge structures would carry Interstate traffic, BRT, bicycles, and pedestrians. There would be three through-lanes and two auxiliary lanes for I-5 traffic in each direction. Transit would include a BRT system that would operate in an exclusive guideway from Kiggins Bowl in Vancouver to the Expo Center station in Portland. Express bus service and local and feeder bus service would increase to serve the added transit capacity. BRT buses would turn around at the existing Expo Station in Portland, where riders could transfer to the MAX Yellow Line.

Alternative 3: This is similar to Alternative 2 except that LRT would be used instead of BRT. This alternative is analyzed both with a toll collected from vehicles crossing the Columbia River on the new I-5 bridge, and with no toll. LRT would use the same transit alignment and station locations. Transit operations, such as headways, would differ, and LRT would connect with the existing MAX Yellow Line without requiring riders to transfer.

Alternative 4: This alternative would retain the existing I-5 bridge structures for northbound Interstate traffic, bicycles, and pedestrians. A new crossing would carry southbound Interstate traffic and BRT. The existing I-5 bridges would be re-striped to provide two lanes on each structure and allow for an outside safety shoulder for disabled vehicles. A new, wider bicycle and pedestrian facility would be cantilevered from the eastern side of the existing northbound (eastern) bridge. A new downstream supplemental bridge would carry four southbound I-5 lanes (three through-lanes and one auxiliary lane) and BRT. BRT buses would turn around at the existing Expo Station in Portland, where riders could transfer to the MAX Yellow Line. Compared to Alternative 2, increased transit service would provide more frequent service. Express bus service and local and feeder bus service would increase to serve the added transit capacity.

Alternative 5: This is similar to Alternative 4 except that LRT would be used instead of BRT. LRT would have the same alignment options, and similar station locations and requirements. LRT service would be more frequent (approximately 3.5 minute headways during the peak period) compared to 7.5 minutes with Alternative 3. LRT would connect with the existing MAX Yellow Line without requiring riders to transfer.

1.3 Long-Term Effects

The roadway options would result in between 16 and 18 full parcel acquisitions, 50 to 82 partial acquisitions, and 13 to 24 parcels with building impacts, including 16 to 20 residential displacements. The transit options would result in between 6 and 23 full parcel acquisitions, 42 to 96 partial acquisitions, and 4 to 18 parcels with building impacts, including 7 to 16 residential displacements. Additional acquisitions or relocations could be required if access changes limit the function of a particular parcel, or if mitigation measures require additional property. These impacts are discussed to the extent that they are known at this point in project development.

1.3.1 Regional Effects

There are no regional effects resulting from acquisitions. One exception to this may be that 13 to 23 floating homes on Hayden Island would no longer be able to dock in their current location. There are limited relocation options in the area that would provide the same level of access to a roadway network and goods and services. All of the build alternatives would remove floating homes, although some remove more than others.

1.3.2 Segment-level Effects

For purposes of the analysis, the project has been divided into several segments. Segment A extends from Delta Park in Portland to the Mill Plain District in Vancouver. Segment B extends from roughly Mill Plain Boulevard northward.

For the transit alternatives, Segment A is separated into Segment A1: Delta Park to South Downtown and Segment A2: South Downtown to Mill Plain District. The boundary between the two segments is just north of Fourth Street in downtown Vancouver.

See Exhibit 1-2 for a map of the project area and segment boundaries.

1.3.2.1 Roadway

In Segment A, the Delta Park to Mill Plain Segment, the highway alternatives are associated with 25.7 to 36.9 acres of right-of-way acquisitions (including 2 to 10 acres of DOT right-of-way), representing between 66 and 82 parcels. The supplemental bridge would require fewer parcel acquisitions and less total acreage that the replacement bridge alignment.

In addition to the impacts listed above, all of the roadway alternatives would affect floating homes on Hayden Island. Between 13 and 15 floating homes would need to be moved under the roadway options.

In Segment B, the Mill Plain to North Vancouver Segment, the highway alternatives are associated with between 2.0 and 2.7 acres of right-of-way acquisitions, representing between 27 and 41 parcels. The supplemental bridge would require fewer parcel acquisitions and less total acreage that the replacement bridge alignment.

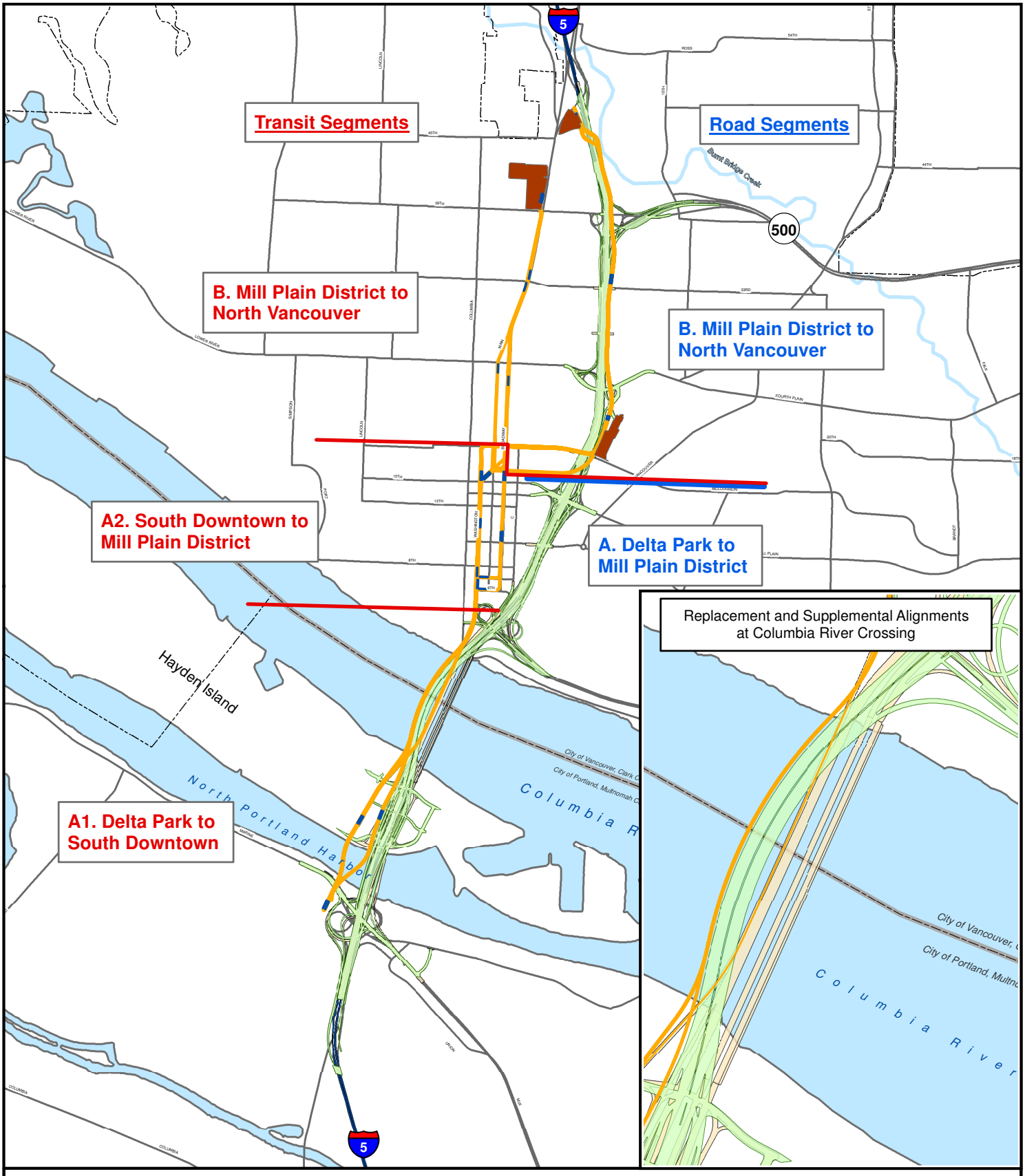

Exhibit 1-2: Project Area and Alternatives

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Analysis by J. Koloszar; Analysis Date: Aug.-2007; Plot Date: Dec.-2007; File Name: JH_014_8x11.mxd

1.3.2.2 Transit

In Segment A1, the transit alignments would require between 2.3 and 4.2 acres of additional right-of-way and would affect 14 to 23 parcels. Up to eight buildings would be affected under the different transit scenarios. Additionally, up to eight floating homes in North Portland Harbor and possibly one home in the Kenton neighborhood would be affected under the transit alignments.

The transit options in Segment A2 are associated with relatively few acquisitions. Between three and 13 parcels would be affected (totaling up to two city blocks), and no or one building could be impacted in Segment A2. At most, acquisitions would total 1.3 acre.

The transit options in Segment B have right-of-way needs ranging between 9.7 and 25.2 acres (including 2 to 14 acres of WSDOT-owned property), depending on alignment. There are few differences in the right-of-way needs between BRT and LRT within Segment B. Generally, the Vancouver alignments would require more right-of-way than the I-5 alignments. This is largely due to its location on a city street with existing land uses on both sides, contrasted with the I-5 transit alignment which would be adjacent to I-5. The Vancouver alignments also include the Lincoln Park and Ride, which would require the full acquisition of 11 parcels and 17 acres (12 acres of which is owned by WSDOT).

Although efforts have been made to minimize double-counting, the reader should note that some parcels and building impacts are affected by both transit and highway and may therefore be discussed in both the highway and the transit sections.

1.4 Temporary Effects

As shown in Exhibit 1-3, temporary construction easements would be needed for project construction, of between 1.0 and 1.6 acres of any of the roadway alternatives and 0.5 to 1.5 acres for any of the transit alternatives. Note that the offset and adjacent alignments are choices in Segment A and the 16th and Main Streets alignments are choices in Segment B—the temporary impacts need to be summed together in these two areas.

These easements would be temporary and the property would be restored to the landowner after construction is complete. See Section 6, Temporary Effects, for additional detail and a map showing the areas with potential temporary construction easements.

Exhibit 1-3. Temporary Construction Easements (Acres)

	Oregon	Washington	Total[a]
Roadway Downstream	0.9	0.7	1.6
Roadway Supplemental	0.5	0.5	1.0
Transit – Offset	0.9 – 1.0	0.2 – 0.4	1.0 – 1.4
Transit – Adjacent	0.3 – 0.4	0.2 – 0.4	0.5 – 0.8
Transit – 16th	N/A	<0.1 – 0.1	<0.1 – 0.1
Transit – Main	N/A	0	0

[a] Numbers do not sum due to rounding.

1.5 Mitigation

Right-of-way business displacements, losses in parking, and changes in access identified in this report are based on preliminary designs for the build alternatives. As designs are advanced, the project team will seek to reduce the amount of land that must be acquired for right-of-way and to avoid acquiring businesses where possible. However, it is also possible that design refinement could increase impacts for some parcels.

Where property acquisition and residential or business building impacts are unavoidable, mitigation measures will apply. These mitigation measures are addressed by federal and state regulations, which require that property be purchased at fair market value, and that all residential displacees be provided decent, safe, and sanitary replacement housing. Households and businesses qualifying for relocation assistance will be accommodated per the Uniform Relocation and Real Property Acquisitions Policies Act of 1970 as amended (Uniform Act).

Federal and state guidelines determine the standards and procedures for providing such replacement housing, based on the characteristics of individual households. Eligibility for relocation benefits would be determined during the final design phase of the project. Relocation benefit packages usually include replacement housing for owners and renters, moving costs, and assistance in locating replacement housing. Similarly, relocation benefits for businesses can include moving costs, site search expenses, and business re-establishment expenses. As with residential displacees, the specifics of a relocation package are determined on an individual basis, determined by ownership or tenant status.

The displacement of publicly owned facilities, such as the ODOT permit center, FHWA Western Federal Lands building, or WSDOT maintenance facility could be mitigated by functionally replacing the property acquired with another facility that would provide equivalent utility. Providing functional replacements could occur in lieu of paying the fair market value of the property.

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2. Methods

2.1 Introduction

This report presents the evaluation of potential land acquisitions, building impacts, and relocations that would result from the proposed I-5 CRC project alternatives. Definitions of the different types of right-of-way impacts follow.

- Acquisition – An acquisition occurs if part or all of a property or property right is purchased or otherwise acquired for temporary or permanent use by the project.
- Building Impact – A building impact occurs if a building or structure is demolished or moved as a result of the project or if people or a business is no longer able to occupy the building as a result of the project.
- Relocation – A relocation occurs if a person or business that is no longer able to occupy their property due to the project receives assistance to move to another location. Relocations could be triggered by access changes, even if the buildings are not impacted.

Where alternatives require new or widened right-of-way, there is potential for acquisitions, building impacts, and relocations. The primary area of potential impact (API) was analyzed for acquisitions and building impacts. The analysis identified residences, businesses, public facilities or other properties that could be acquired by the project. Federal, state, and local laws require that acquisition and relocation effects of projects be assessed and that property acquisitions and relocation for federally funded projects conform to standardized procedures per the Uniform Act. To the extent that it is necessary, the analysis evaluated potential mitigation measures for displaced businesses and residences.

The Portland-Vancouver I-5 Partnership, a group of Washington and Oregon citizens and leaders organized to respond to concerns about congestion between Vancouver and Portland, recommended that the specific impacts be assessed for residential and commercial relocations. In Clark County, the Partnership recommended assessing (a) relocations and encroachments, with attention to low-income households because of the lack of decent, affordable housing; and (b) impacts on the availability of affordable housing. In Portland, the Partnership recommended assessing (a) relocations and encroachments to residential, business and commercial properties; (b) impacts on property values; and (c) cumulative impacts of all projects in the area if there is a loss of housing.

This Acquisitions Technical Report addresses the following questions, based on available conceptual designs:

- How many acres of land and how many parcels would be acquired under each project alternative?
    - What are the current uses of the land?

- How many building impacts would occur under each project alternative?
  - How many of the building impacts are of businesses?
  - How many residential buildings would be impacted?
- Are there comparable business and housing opportunities in the area to accommodate these businesses and/or households?

2.2 Study Area

This evaluation used two study areas for environmental effects: the primary and secondary APIs, shown in Exhibit 2-1 and described below.

2.2.1 Primary API

The primary API is the area most likely to experience direct impacts from construction and operation of proposed project alternatives. Most physical project changes will 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 because the light rail joins its existing alignment away from I-5 and the larger API buffer is no longer needed for the analysis of potential impacts.

2.2.2 Secondary API

The secondary API represents the area where indirect impacts (e.g., traffic and development changes) may occur from the proposed project alternatives. The secondary API is relevant to this study for the analysis of potential relocation properties.

2.3 Effects Guidelines

The analysis addressed two types of direct impacts: the acquisition of additional public right-of-way and the potential impacts to residential and business structures. The analysis considered permanent acquisition needs as well as temporary acquisitions or building impacts associated with construction easements.

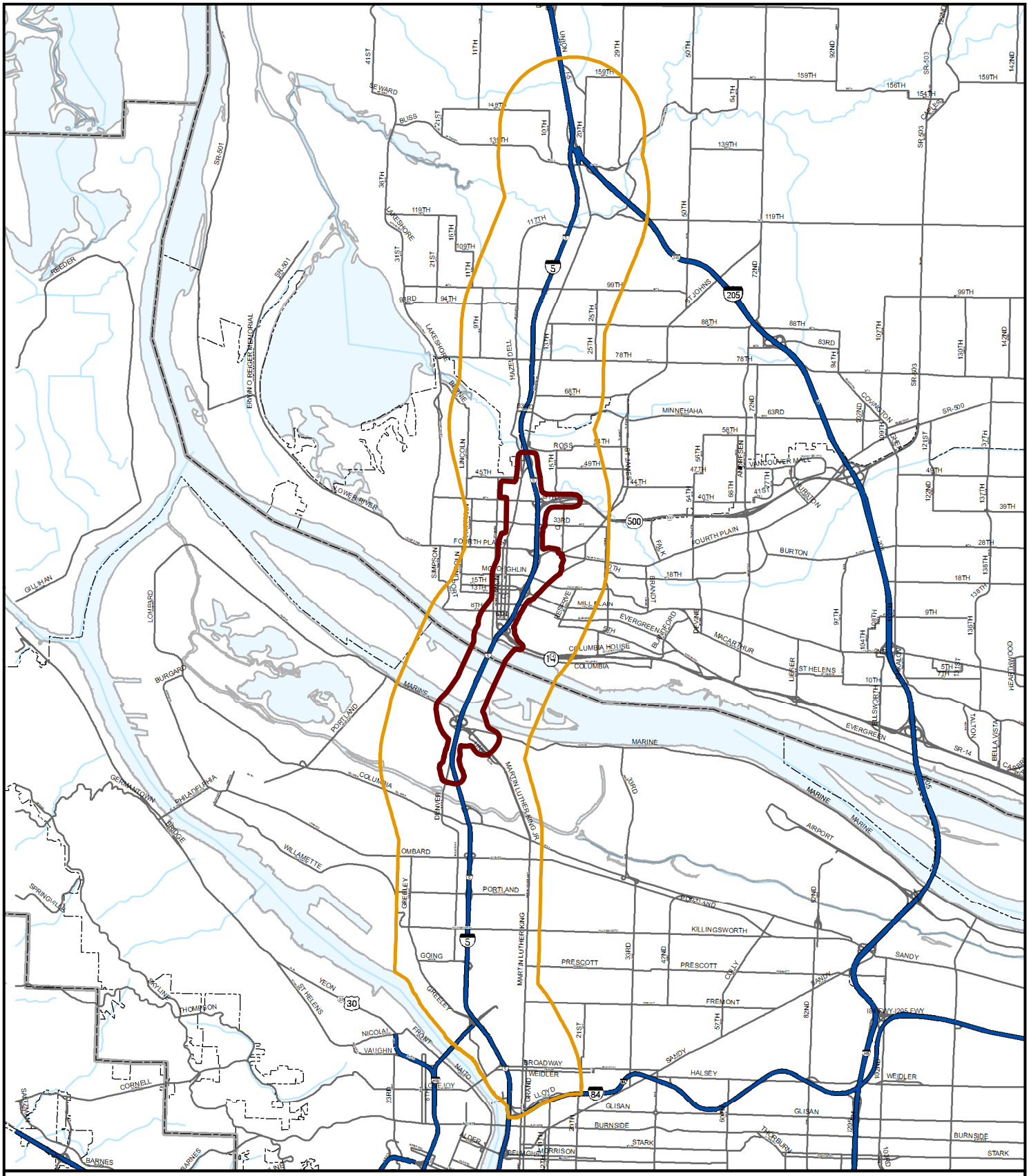

Exhibit 2-1: Area of Potential Impact

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The project considered the number and character of full and partial acquisitions, building impacts, the potential for relocation, and other factors to determine relative impacts. The secondary impacts of acquisitions and building impacts in relation to specific environmental conditions were assessed separately in the Land Use, Environmental Justice, Section 4(f), Neighborhoods, and Economics Technical Reports.

2.4 Data Collection Methods

Right-of-way estimates were developed by an engineering team using CADD drawings of the proposed alternatives. The engineering data included information on potential permanent right-of-way and construction easements, which would be temporary. These CADD drawings were translated into a database using GIS. A real estate acquisition professional went through each item in the database and determined if acquisitions were full or partial, and if building impacts would occur (see Section 2.5, Analysis Methods, for more information). Potential temporary construction easement needs were also assessed.

2.5 Analysis Methods

There were five basic steps in the analysis. This section outlines the steps of data collection that were required for the analysis.

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

2.5.1 Step 1: Determine Right-of-Way Requirements

General requirements for right-of-way for the project were determined by the project team during the conceptual engineering phase. The project team identified and mapped the boundaries of the right-of-way based upon the conceptual designs. Project staff then determined the general dimensions of the required right-of-way to identify the extent of the potential impacts and determine the type of acquisitions (full or partial acquisitions, or construction easements) that may be required for both construction and permanent operations. The team also assessed whether building impacts would occur based on the right-of-way needs.

The transportation engineering team identified additional supporting facilities for the build alternatives, which are included in the count of acquisitions. For example, arterial widenings at interchanges, or right-of-way for high-capacity transit for the first phase of the transit project, are included in the summary of acquisitions for each build alternative.

2.5.2 Step 2: Identify Ownership and Land Use of Parcels

Tax assessors' records for Multnomah and Clark Counties, and other information gathered through contacts with local agency staff, property owners and community

meetings were used to determine the ownership and use of properties required for construction of the alternatives.

Any public facilities potentially affected by the alternatives and options were identified initially through the conceptual engineering plans. Public facilities include offices, recreation centers, warehouse or storage buildings, parking lots, parks, etc. operated and maintained by public agencies. This would include any public agency function housed on property leased from private parties. The location, type and condition of any such facilities will be verified.

2.5.3 Step 3: Verify Findings through Research and Field Investigation

To the extent possible, data were verified through field investigation by the project team. The location, type of use, and condition of existing buildings and other improvements was checked. Notations were made concerning the operating characteristics of particular properties subject to acquisition.

2.5.4 Step 4: Identify Characteristics of Acquired Households and Businesses

General household characteristics, based on aggregate 2000 U.S. Census data, were assessed for the areas where potential residential building impacts would occur. Block or block-group data were reviewed to estimate the number, race and ethnicity (potential minority status), tenancy and income characteristics in those areas where building impacts would occur. Neighborhood or specific parcel and household data were used where available and appropriate.

For potential business building impacts, the analysis also addressed the type and size (measured by number of employees and gross revenue) of the potentially displaced business or businesses. The primary sources of information included 2000 U.S. Census reports, information gathered by local government agencies, site visits and other sources. A significant portion of this analysis relied on information being gathered for the Economics, Environmental Justice, Noise and Vibration, and Neighborhoods and Population Technical Reports.

2.5.5 Step 5: Assess Mitigation Potential

The analysis for mitigation opportunities extended beyond the primary API, into the secondary API and the larger community, in order to assess relocation impacts and the availability of suitable relocation properties.

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3. Coordination

The CRC project team conducted extensive outreach to neighborhood groups, business groups, and other potentially affected parties, as summarized in the Draft EIS.

The project team also coordinated with Vancouver Housing Authority and conducted research with the City of Portland regarding the presence of subsidized housing in the project area. No Section 8 or other subsidized housing units would be acquired under any of the alternatives.

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4. Affected Environment

4.1 Introduction

This section provides a brief overview of the affected environment. Greater details regarding neighborhood, land use planning, and economics, are available in the respective discipline reports. A map of the project segments is included as Exhibit 1-2

4.2 Regional Conditions

Oregon's statewide planning laws and Washington's Growth Management Act agree on general principles of compact urban form, preservation of rural areas, use of urban growth boundaries, and multimodal transportation systems. The proposed project is near the core of a bi-state metropolitan area that functions largely as one economy and one housing market. Economic conditions have been, and continue to be, relatively healthy in the area, with continued growth in employment and annual home sales (see Economics Technical Report). Land supply is balanced with land needs. This balance is maintained through the growth management legislative processes in both states.

4.3 Residential, Commercial, and Industrial Vacancy Rates

Vacancy and rental rates of residential, commercial and industrial properties are an indication of the potential for finding viable sites for relocating displaced residents and businesses. Higher vacancy rates generally indicate greater potential for relocating a displaced use to a location that is desirable to the property owner or tenants. The average length of time that single family homes are on the market prior to sale and median single family home sale price also indicate the potential for finding viable sites for relocating residents of single family homes.

In November 2007, the Portland-Vancouver metropolitan area had an 8.3 month supply of homes for sale and a median home sale price of $285,000. Median annual home prices, but not supply of homes, are also available for smaller geographic areas for 2007, up to and including the month of November 2007. For the seven subareas relevant to the CRC project, median annual sale prices and approximate locations are summarized in Exhibit 4-1.

Exhibit 4-1. Median Home Prices

Subarea	Median Annual Sale Price	Northern Boundary	Western Boundary	Southern Boundary	Eastern Boundary
Downtown Vancouver	$215,500	39th Street	Vancouver Lake	Columbia River	I-5
Lincoln – SW Hazel Dell	$230,000	78th Street	Vancouver Lake	39th Street	I-5
SW Heights	$284,300	Mill Plain Blvd.	I-5	Columbia River	Andresen Blvd.
NW Heights	$170,000	SR 500	I-5	Mill Plain Blvd.	Andresen Blvd.
E Hazel Dell/ Minnehaha	$235,000	78th Street	I-5	SR 500	Andresen Blvd.
North Portland	$235,500	Columbia River	Willamette River	Willamette River	Williams Ave.
NE Portland[a]	$283,000	Columbia River	Williams Ave.	East Burnside	182nd Ave.

Source: Regional Multiple Listing Services 2007.

[a] The "NE Portland" subarea includes Hayden Island east of I-5 and the Bridgeton Neighborhood on the south shore of the North Portland Harbor and east of I-5.

In February of 2008, industry reports showed that West Vancouver, which includes the Vancouver portion of the project area, has a higher vacancy rate, but higher costs per square foot for multi-family residential units than the North Portland/St Johns area (Metro Multifamily Housing Association 2007). These rates are listed in the Exhibit 4-2.

Exhibit 4-2. Multi-family Vacancy and Rental Rates

Subarea	Vacancy Rates	Monthly Rental Rate per sq ft	Monthly Rental Rate for 1-Bedroom Apt[a]	Northern Boundary	Western Boundary	Southern Boundary	Eastern Boundary
West Vancouver[b]	4.65%	$0.88	$572.00	159th Street	Columbia River	Columbia River	117th Avenue
N Portland/ St. Johns[c]	2.61%	$0.81	$526.50	Columbia River	Willamette River	I-84	Williams Ave

Source: Metro Multifamily Housing Association 2007.

[a] Typical apartment defined as 650 square feet.

[b] Corresponds to zip codes 98660-98666, 98685, 98656, and 98668.

[c] Corresponds to zip codes 97203, 97217, 97227, and 97283.

All build alternatives would require the displacement of floating homes in the North Portland Harbor. Most marinas currently operate at capacity, and there are therefore very few floating home slips available in the metropolitan area. As there is no known planned growth in the number or size of marinas, there are limited opportunities to relocate floating homes in the region. Additionally, displaced floating homes may not have the structural integrity to be moved or may not meet with architectural design standards at other marinas.

All build alternatives will likely require commercial and industrial property. Office space is more available than either retail or industrial space in the CRC project area, as illustrated in Exhibit 4-3.

Exhibit 4-3. Office, Retail and Industrial Vacancy Rates

Subarea	Vacancy Rates	Monthly rental rate for Class A office space per sq foot	Monthly rental rate for Class B office space per sq foot	Northern Boundary	Western Boundary	Southern Boundary	Eastern Boundary
Office Space							
Portland-Vancouver	11.5%	$25.01	$19.51	Both Metropolitan areas			
Vancouver Central Business District/West Vancouver[a].	11.5%	$24.32	$18.08	Burnt Bridge Creek Greenway	Columbia River	Columbia River	I-5
Retail Space[b]							
Hayden Island	5.74%	N/A	N/A	Columbia River	Oregon Slough	North Portland Harbor	Oregon Slough
West Vancouver	8.83%	N/A	N/A	159th Street	Columbia River	Columbia River	117th Avenue
Industrial Space[c]							
Portland-Vancouver	5.7%	N/A	N/A	Both Metropolitan areas			
Columbia Corridor[c]	6.9%	N/A	N/A	South shore of the Columbia River from its confluence with Sandy River to the Willamette River			
Rivergate	7.4%	N/A	N/A	At confluence of Willamette and Columbia Rivers			

[a] All vacancy rates based on the fourth quarter of 2007.

[b] Grubb & Ellis Company 2007

[c] CB Richard Ellis, 2007

[d] Grubb & Ellis Company 2007

Industry research reports that new industrial development will slow in 2008, though vacancy rates are still expected to increase modestly east of the Willamette River in Oregon (Grubb & Ellis 2007).

4.3.1 Vacancy Rates in Gresham Oregon

The existing TriMet Ruby Junction Maintenance Facility in Gresham could potentially be expanded if light rail is the chosen high-capacity transit mode. This expansion would result in the displacement of some residences and retail/services and industrial uses. As this area is relatively removed from the project area, an additional analysis of vacancy rates in this area is appropriate.

Vacancy and rental rates of residential, commercial and industrial properties are an indication of the potential for finding viable sites for relocating displaced residents and businesses. Higher vacancy rates generally indicate greater potential for relocating a displaced use to a location that is desirable to the property owner, renters, or tenants. The average length of time SFRs are on the market prior to sale and median SFR sale price are also an indication of the potential for finding viable sites for relocating residents of SFRs.

In February of 2007, industry reports showed a 3.23 percent multifamily residential vacancy rate for rentals in the Portland-Vancouver Metro Area with a rental rate averaging $0.83 per square foot per month. Multifamily residential vacancy rates and rental rate averages are also available for the Gresham/Troutdale/Fairview/Wood Village subarea, within which the Ruby Junction Maintenance facility is located, as well as two subareas which are within a half mile of the maintenance facility: the Outer NE (Portland) and Outer SE (Portland) subareas. The boundaries of the subareas correspond to zip code boundaries. The average multifamily vacancy rates and rental rates for each subarea, as well as boundary information for each subarea, is included in Exhibit 4-4.,

Exhibit 4-4. Multi-family Vacancy and Rental Rates

Subarea	Multifamily Average Vacancy Rate	Multifamily Average Rental Rate Per Square Foot	Corresponding Zip Codes	Approximate Northern Boundary	Approximate Western Boundary	Approximate Southern Boundary	Approximate Eastern Boundary
Gresham	2.91%	$0.75	97024, 97030, 97060, 97080,	Columbia River	202nd Avenue	Clackamas County	Sandy River
Outer NE	4.82%	$0.73	97220, 97230	Columbia River	82nd Avenue	Burnside Street	202nd Avenue
Outer SE	3.77%	$0.67	97216, 97233, 97266, 97236	Burnside Street	82nd Avenue	Sunnyside Road	190th Avenue

Vacancy rates in the office market was 11.5 percent in the Portland-Vancouver area in the fourth quarter of 2007, with an estimated asking rent of $25.01 per square foot for Class A office space and $19.51 per square foot for Class B office space. Office vacancy rates and estimated asking rents are also available for the Eastside submarket, within which the Ruby Junction maintenance facility is located. In the fourth quarter of 2007, office vacancy rates in the Eastside submarket were 12.3 percent with an estimated asking rent of $22.41 per square foot for Class A office space and $18.85 per square foot for Class B office space. The boundary of the Eastside submarket is roughly I-84 (east of I-205) and US 30 (west of I-205) to the north; the Willamette River to the west; Clackamas County to the south; and unincorporated Multnomah County to the east. The Eastside submarket does not include Portland's Lloyd District.

Industrial vacancy rates were 5.7 percent in the Portland-Vancouver area in the fourth quarter of 2007, with an estimated asking rent of $0.42 per square foot per month for warehouse/distribution space and $0.82 per square foot per month for research and development/flex space. Industrial vacancy rates and estimated asking rents are also available for the Gresham/Outer SE submarket, within which the Ruby Junction maintenance facility is located. In the fourth quarter of 2007, industrial vacancy rates were 16.1 percent with an estimated asking rent of $0.42 per square foot per month for warehouse/distribution space and $0.86 per square foot per month for research and development/flex space. It is anticipated that industrial vacancy in general will increase in submarkets east of the Willamette River in Oregon. The boundary of the Gresham/Outer SE submarket is roughly Burnside Street (west of 182nd Avenue) and I-84 (east of 182nd Avenue) to the north; 181st Avenue (north of Burnside Street) and I-

205 (south of Burnside Street) to the west; Clackamas County to the south; and the region's urban growth boundary to the east.

In December 2007, SFRs took an average of 73 days to sell in the Portland-Vancouver Metropolitan area and had a median sale price of $276,500. Average time on market and median home prices are also available for the Gresham/Troutdale sub-area, within which the Ruby Junction maintenance facility is located. For December 2007, SFRs took an average of 89 days to sell in the Gresham/Troutdale sub-area and had a median home sale price of $254,800. The boundaries of the Gresham/Troutdale sub-area is the Columbia River to the north; 182nd Avenue to the west; Highway 212 to the Mount Hood Highway, excluding Boring, and including Sandy to the south; and a line extending south from the Columbia River along Salzman Road to Langensand Road at the Mount Hood Highway to the east.

4.4 Segment A: Delta Park to Mill Plain District

Segment A extends from Delta Park in Portland to the Mill Plain District in Vancouver.

Segment A in Oregon extends from N Victory Boulevard to the mainstem Columbia River, and includes Hayden Island. The majority of the North Portland Subarea is composed of industrial, park, and commercial properties, though Hayden Island has single-family, multi-family, and houseboat housing facilities in addition to retail, commercial, and hotel development.

Segment A in Vancouver extends from downtown Vancouver to the Mill Plain District (around 16th Street). The transit alignments pass through mixed commercial and residential districts in downtown Vancouver, generally on the west side of I-5.

For the transit alternatives, Segment A is separated into Segment A1: Delta Park to South Downtown and Segment A2: South Downtown to Mill Plain District. The boundary between the two segments is just north of Fourth Street in downtown Vancouver.

4.5 Segment B Mill Plain District to North Vancouver

This subarea extends from roughly Mill Plain Boulevard northward. This area is characterized primarily by residential development, and includes commercial development along major arterial roadways, parks near I-5, and churches.

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5. Long-Term Effects

5.1 How is this section organized?

This section describes the long-term impacts that would be expected from the I-5 CRC alternatives and options. The section first describes impacts from the four full alternatives and the No-Build Alternative. The build alternatives are the comprehensive alternatives that include specific highway, transit, bicycle, pedestrian and other elements. This discussion focuses on how these alternatives would affect corridor and regional impacts and performance. It then focuses on impacts that would occur with various design options at the segment level, for example, comparing the impacts of each alignment option in each segment. Finally, it provides a more comparative and synthesized summary of the impacts associated with the system-level choices. This three-part approach provides a comprehensive description and comparison of (1) the combination of system-level and segment level choices expressed as five specific alternatives (2) discrete system-level choices, and (3) discrete segment-level choices.

This section addresses direct long-term impacts. No acquisitions related to indirect impacts are anticipated. Indirect impacts from land acquisition are discussed in other Technical Reports (e.g., Land Use, Economics, and Neighborhoods).

5.2 Impacts from Full Alternatives

This section describes the impacts from the four full alternatives and No-Build Alternative. These are representative combinations of highway, river crossing, transit and pedestrian/bicycle alternatives and options covering all of the CRC segments. They represent the range of system-level choices that most affect overall performance, impacts and costs. The full alternatives are most useful for understanding the regional impacts, performance and total costs associated with the CRC project. The full alternatives with a replacement bridge focus exclusively on the I-5 alignment for high-capacity transit. The full alternatives with a supplemental bridge focus exclusively on the Vancouver alignment. For a fuller discussion of the tradeoffs between the I-5 and Vancouver alignments, see Section 5.5.4, “Major Transit Alignment: How does the Vancouver alignment compare to the I-5 alignment?”

Tolling does not have an influence on the number or type of acquisitions associated with the project alternatives, so the variations in alternatives addressing tolling are not addressed in this document. Section 5.3, Impacts from Segment-Level Alternatives, provides detail on impacts unique to each alternative.

5.2.1 No-Build Alternative

No CRC-related right-of-way acquisitions are associated with the No-Build Alternative.

5.2.2 Replacement Crossing with LRT and I-5 Standard Toll/No Toll (Alternative 3)

Alternative 3 would require the acquisition of approximately 51.7 to 70.3 acres of land (including 12 to 24 acres of DOT land), depending on the transit alignment option. In general the Vancovuer transit alignment would result in greater acquisition impacts than the I-5 transit alignment. Alternative 3 would also result in the displacement of approximately 21 to 36 residences, depending on transit alignment.

Alternative 3 would displace the ODOT permit center on Hayden Island, and possibly the WSDOT maintenance facility at 39th and Main when paired with Vancouver alignment or Mill Plain MOS.

Alternative 3 would require the expansion of the existing TriMet Ruby Junction light rail maintenance facility. This expansion would fully acquire 14 parcels zoned for heavy industrial use, and displace up to seven potentially inhabited residences and eight to nine parcels containing a mix of service and light industrial uses.

5.2.3 Replacement Crossing with BRT and I-5 Standard Toll (Alternative 2)

Alternative 2 would result in the same number of residential displacements, and displacements of civic uses as Alternative 3. The total acreage requirements for this alternative would be similar, but not exactly the same as Alternative 2, as there are slight differences in acquisition impacts between the two HCT modes.

The primary difference in terms of right-of-way acquisitions for this option compared to the LRT options is that BRT would require an expanded maintenance station in Vancouver, while the LRT option would require an expanded maintenance station in Gresham. Alternative 2 would require the expansion of the existing C-TRAN bus maintenance facility. This expansion would acquire five parcels zoned for light industrial use and would displace one business and two residences directly south of the existing facility.

There are also slight differences in property acquisitions from BRT versus LRT near the current terminus of the MAX Yellow line, the Expo Center transit station. At the Expo Center transit station, bus rapid transit would require 1.1 acres, as compared to 0.4 acre for light rail of TriMet owned property. Buses would require a turnaround area and passenger facility so riders could transfer between buses and light rail. Light rail would not require this additional transfer and turnaround area as fewer buses would be transferring passengers to this station.

Additionally, the transit alternatives would require different acquisitions depending on mode (LRT vs. BRT) and station design in Segment A2. The alignment for LRT, which must allow for wider turns than BRT, could potentially affect a greater number of parcels and potentially one business.

5.2.4 Supplemental Crossing with LRT and I-5 Higher Toll (Alternative 5)

Alternative 5 would require the acquisition of approximately 40.6 to 58.8 acres of land (including 4 to 16 acres of DOT land), depending on the transit alignment option. In

general the Vancouver transit alignment would result in greater acquisition impacts than the I-5 transit alignment. Alternative 5 would also result in the displacement of approximately 24 to 33 residences, depending on transit alignment.

Alternative 5 would displace the ODOT permit center on Hayden Island, and possibly the WSDOT maintenance facility at 39th and Main when paired with Vancouver alignment or Mill Plain MOS.

Alternative 5 would require the expansion of the existing TriMet Ruby Junction light rail maintenance facility. This expansion would fully acquire 14 parcels zoned for heavy industrial use, and displace up to seven potentially inhabited residences and eight to nine parcels containing a mix of service and light industrial uses.

5.2.5 Supplemental Crossing with BRT and I-5 Higher Toll (Alternative 4)

Alternative 4 would result in the same number of residential displacements, and displacements of civic uses as Alternative 4. The total acreage requirements for this alternative would be similar, but not exactly the same as Alternative 4, as there are slight differences in acquisition impacts between the two HCT modes as described under Alternative 2.

5.3 Impacts from Segment-level Options

This section describes and compares the impacts associated with specific highway alignment and interchange options and specific transit alignments and options. They are organized by Segment, including:

- Segment A: Delta Park to Mill Plain District
- Segment B: Mill Plain District to North Vancouver

For transit options, Segment A is divided into two sub-segments, each with a discrete set of transit choices:

- Sub-segment A1: Delta Park to South Vancouver
- Sub-segment A2: South Vancouver to Mill Plain District

Impacts from highway options are described separately from impacts from transit options. The purpose of this organization is to present the information according to the choices to be made. Where the traffic and transit choices would have a substantial effect on each other, this is considered.

5.3.1 Segment A: Delta Park to Mill Plain District - Highway Alternatives

Exhibits 5-1 and 5-2 show the right-of-way needs associated with the different highway alternatives.

Exhibit 5-1. Segment A: Right-of-way Acquisitions – Highway Alternatives

Highway Segment A					
Downstream	**Full**	**Partial**	**All Parcels Affected**	**Parcels with Building Impacts**	**Acres**
Oregon	13	39	52	11	31.3
Washington	5	25	30	5	5.6
Total	18	64	82	18	36.9[c]
Supplemental	**Full**	**Partial**	**All Parcels Affected**	**Parcels with Building Impacts**	**Acres**
Oregon	12	38	50	15	24.2
Washington	4	12	16	5	1.9
Total	16	50	66	19	26.1[d]

[a] The Fort of Vancouver parcel has two buildings that could potentially be impacted under the downstream alternatives

[b] Does not include impacts to floating homes on Hayden Island.

c This total includes 9.6 acres of ODOT owned right-of-way at Marine Drive and the ODOT permit center.

d This total includes 2 acres of ODOT owned right-of-way associated with the ODOT permit center.

In Delta Park to Mill Plain (Segment A), the highway alternatives are associated with between 26.1 and 36.9 acres of right-of-way acquisitions, representing between 64 and 81 parcels. These totals include ODOT right-of-way that would be required for the bridge replacement (2 acres for supplemental and 9.6 for replacement). Thus, 24.1 to 27.3 acres of privately owned right-of-way would be required for the roadway alternatives. The supplemental bridge would require the fewest parcel acquisitions and least total acreage, as it would use the existing bridge for northbound traffic.

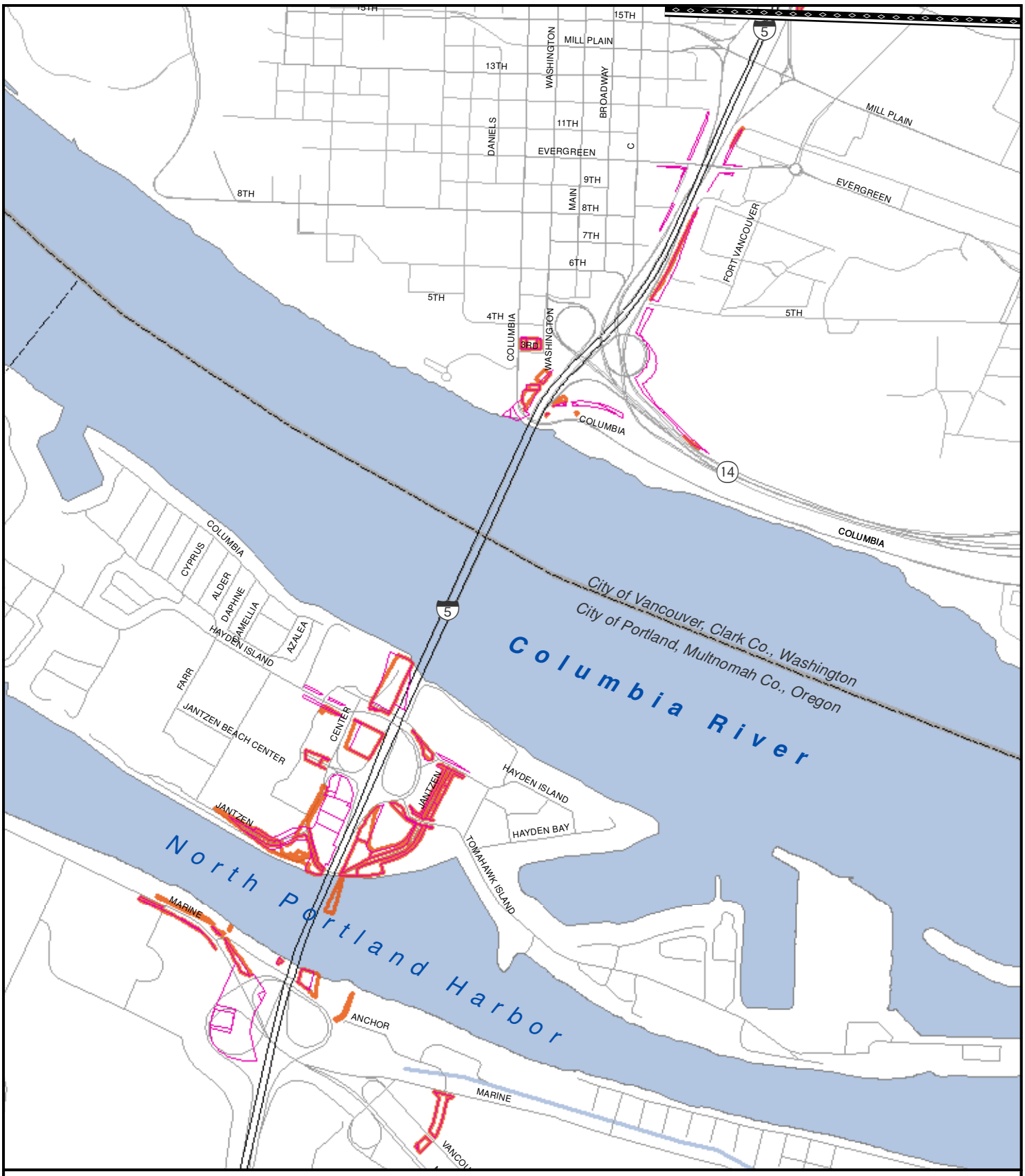
In addition to the impacts listed above, all of the roadway alternatives would affect floating homes on Hayden Island. Between eight and 20 floating homes would need to be moved under the roadway options.

The Southern and Diagonal Marine Drive interchange options could require additional acquisitions. The Southern realignment of Marine Drive could require the acquisition of two buildings that are used by a warehouse distributing business on the corner of Marine Drive and Force Avenue. The Diagonal realignment of Marine Drive would divide the Expo Center Complex by removing about 3 acres of land on the north side of the complex. The northern building of the Expo Center would be removed to provide right-of-way for Marine Drive.

In addition to the acquisition of specific properties, the replacement or supplemental river crossings may require airspace or aerial guideway easements from properties being passed over, such as the Burlington-Northern SantaFe (BNSF) railroad. An aerial guideway easement would include the area immediately surrounding and beneath the elevated structure.

For information on the combination of roadway and transit impacts on Hayden Island, see Section 5.3.3.3, Segment A1: Combined Roadway and Transit Impacts to Hayden Island.

For information on the zoning of these parcels, see the Land Use Technical Report.



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Replacement RoW Requirement

Supplemental RoW Requirements

Roadway Segment Boundary

Exhibit 5-2: Right-of-Way Requirements for Highway Alignments

Segment A

Columbia River CROSSING

Analysis by J. Koloszar; Analysis Date: Nov-2007; Plot Date: Apr.-2008; File Name: RoadAlignments_MK089.mxd

5.3.1.1 Replacement Crossing

The replacement crossing would require an estimated 36.9 acres of additional right-of-way (9.6 acres are owned by ODOT). This alternative is associated with 18 full acquisitions and 64 partial acquisitions, including two parcels supporting floating home marinas.

In Oregon, the full acquisitions are from public, parking, or vacant lots with the exception of two retail/services parcels. Partial acquisitions with potential building impacts (parcel may be rebuildable) are associated with the ODOT permit center, one hotel, and seven retail/services businesses.

In Washington, full acquisitions would be from one vacant lot, one hotel, two retail/services parcels, and one office/professional services parcel. Partial acquisitions with potential building impacts (parcel may be rebuildable) are associated with one retail/services parcel, one hotel, one office/professional services building, and potentially two buildings on Vancouver National Historic Reserve (VNHR) - Army Depot and the FHWA building. The two buildings on the VNHR are on one parcel and could potentially be avoided under the supplemental crossing.

5.3.1.2 Supplemental Crossing

The supplemental bridge crossing would require an estimated 26.1 acres of additional right-of-way (2 acres are owned by ODOT). This alternative is associated with 16 full and 50 partial acquisitions, and 19 potential building impacts in Segment A, including two parcels supporting floating homes.

In Oregon, the full acquisitions would be from public, parking, or vacant lots, with the exception of five retail/services parcels. Partial acquisitions with building impacts (parcel will be rebuildable) are associated with the ODOT permit center, two hotels, and seven retail/services businesses.

In Washington, full acquisitions would be from railroad right-of-way, public infrastructure, vacant lots, two retail/services parcels, and one office/professional services parcel. A partial acquisition with building impacts (parcel would be rebuildable) is associated with one retail/services building.

5.3.2 Segment B: Mill Plain District to North Vancouver - Highway Alternatives

Exhibits 5-3 and 5-4 shows the right-of-way needs associated with the different highway alternatives in Segment B.

Exhibit 5-3. Segment B: Right-of-Way Acquisitions – Highway Alternatives

Segment B Highway	Full	Partial	All	Parcels with Building Impacts[a]	Acres
Downstream	0	33-41	33-41	4-6	2.3-2.7
Supplemental	0	27-33	27-33	1	2.0

[a] Count of parcels with building impacts.

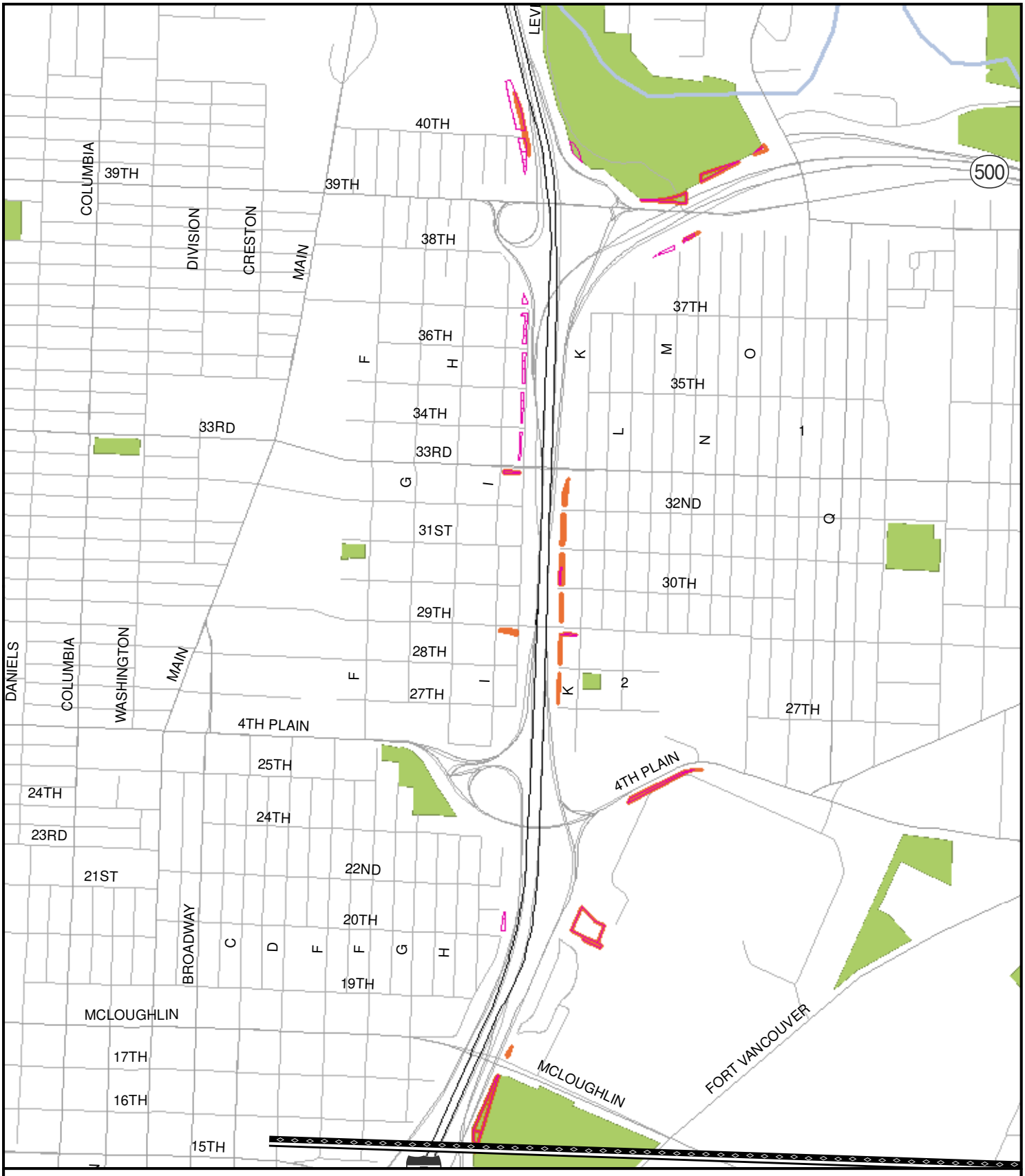


Exhibit 5-4: Right-of-Way Requirements for Highway Options
Segment B

Columbia River CROSSING

Analysis by J. Koloszar; Analysis Date: Nov-2007; Plot Date: Apr.-2008; File Name: RoadAlignments_MK089.mxd

In the Mill Plain to North Vancouver Segment, highway alternatives are associated with approximately 2.0 to 2.7 acres of right-of-way acquisitions, representing between 27 and 41 parcels. The range presented above for the downstream or supplemental options varies based on the pairing of the roadway alignment with one of the two main transit alignments. Building impacts are to parcels with residential uses. Pairing either roadway option with the Vancouver transit alignment would require less roadway right-of-way along I-5. Exhibit 5-4 shows the replacement bridge paired with the I-5 transit alignment and the supplemental bridge paired with the Vancouver transit alignment.

The supplemental river crossing is associated with the fewest building impacts and fewest total acquisitions. The replacement river crossing would require the most new right-of-way. For more detail on these alternatives, see the remainder of this section. For information on the zoning of these parcels, see the Land Use Technical Report.

5.3.2.1 Replacement Bridge

The downstream replacement bridge is associated with no full and 33-41 partial acquisitions in Segment B. In all, this would sum to between 2.3 and 2.7 acres of right-of-way. The partial acquisitions with building impacts (building would be impacted, parcel remains buildable) would affect three or four parcels supporting single-family residences and two multi-family residences. The remaining right-of-way impacts would be to parcels that currently support park, community, and school uses, and seven vacant lots.

5.3.2.2 Supplemental Bridge

The supplemental bridge is associated with no full and 27 to 33 partial acquisitions, totaling 2.0 acres of right-of-way. Up to one building impact to a single family residential parcel is anticipated with the supplemental bridge. The remaining right-of-way impacts would be to parcels that currently support single- and multi-family residences, park, community, and school uses, as well as four vacant lots.

5.3.3 Segment A1: Delta Park to South Vancouver - Transit Alternatives

Exhibits 5-5 and 5-6 show the right-of-way needs associated with LRT and BRT, respectively, in Segment A1. The tables are organized by type of acquisition and total acreage required for each alternative. Data are presented separately for Oregon and Washington and as a total for both. Note that the adjacent and offset transit alignments would require different amounts of right-of-way depending on which highway alternative is selected. Exhibit 5-7 shows the data in a map.

In Segment A1, the transit alignments would require between 2.3 and 4.2 acres of additional right-of-way and would affect 14 to 23 parcels. Up to 8 buildings would be affected. Additionally, floating homes would be affected under the offset transit alignment paired with the replacement or supplemental river crossings, as well as the adjacent transit alignment paired with the supplemental river crossing. The adjacent alignment, when paired with the replacement river crossing, affects no additional floating homes.

Although efforts have been made to minimize double-counting, the reader should note that some parcels are affected by both highway and transit improvements and so may be double-counted in the transit and highway sections.

Exhibit 5-5. Segment A1: Delta Park to South Vancouver LRT Options

Bridge Type	**Replacement**		**Supplemental**	
Transit alignment	Adjacent	Offset	Adjacent	Offset
OR – Full	1	0	1	0
WA – Full	1	1	0	0
Total Full Acquisitions	2	1	1	0
OR – Partial	17	9	11	8
WA – Partial	4	5	8	8
Total Partial Acquisitions	21	14	19	16
All Acquisitions (Parcels)	**23**	**15**	**20**	**16**
OR – Building Impacts	8+	2	7	2+
WA – Building Impacts	1	1	1	1
All – Building Impacts	9+	3	8	3+
OR – Acres	2.5	3.2	2.0	2.6
WA – Acres	0.5	0.6	0.3	0.3
Acres - Total	**3.0**[a]	**3.7**	**2.3**[b]	**2.9**[c]

Numbers may not sum due to rounding.

+ Refers to potential impacts to floating homes.

[a] Includes 0.5 acre of ODOT-owned land

[b] Includes 0.1 acre of ODOT-owned land

[c] Includes 0.7 acre of ODOT-owned land

Exhibit 5-6. Segment A1: Delta Park to South Vancouver BRT Options

Bridge Type	**Replacement**		**Supplemental**	
Transit alignment	Adjacent	Offset	Adjacent	Offset
OR – Full	1	0	1	0
WA – Full	1	1	0	0
Total Full Acquisitions	2	1	1	0
OR – Partial	17	8	11	9
WA – Partial	4	5	8	8
Total Partial Acquisitions	21	13	19	17
All Acquisitions (Parcels)	**23**	**14**	**20**	**17**
OR – Building Impacts	8+	2	7+	2+
WA – Building Impacts	0	0	0	0
All – Building Impacts	8+	2	7+	2+
OR – Acres	3.0	3.7	2.7	3.3
WA – Acres	0.5	0.5	0.4	0.4
Acres - Total	**3.5**	**4.2**	**3.1**[a]	**3.7**[b]

Numbers may not sum due to rounding.

+ Refers to potential impacts to floating homes.

[a] Includes 0.1 acre of ODOT-owned land.

[b] Includes 0.7 acre of ODOT-owned land

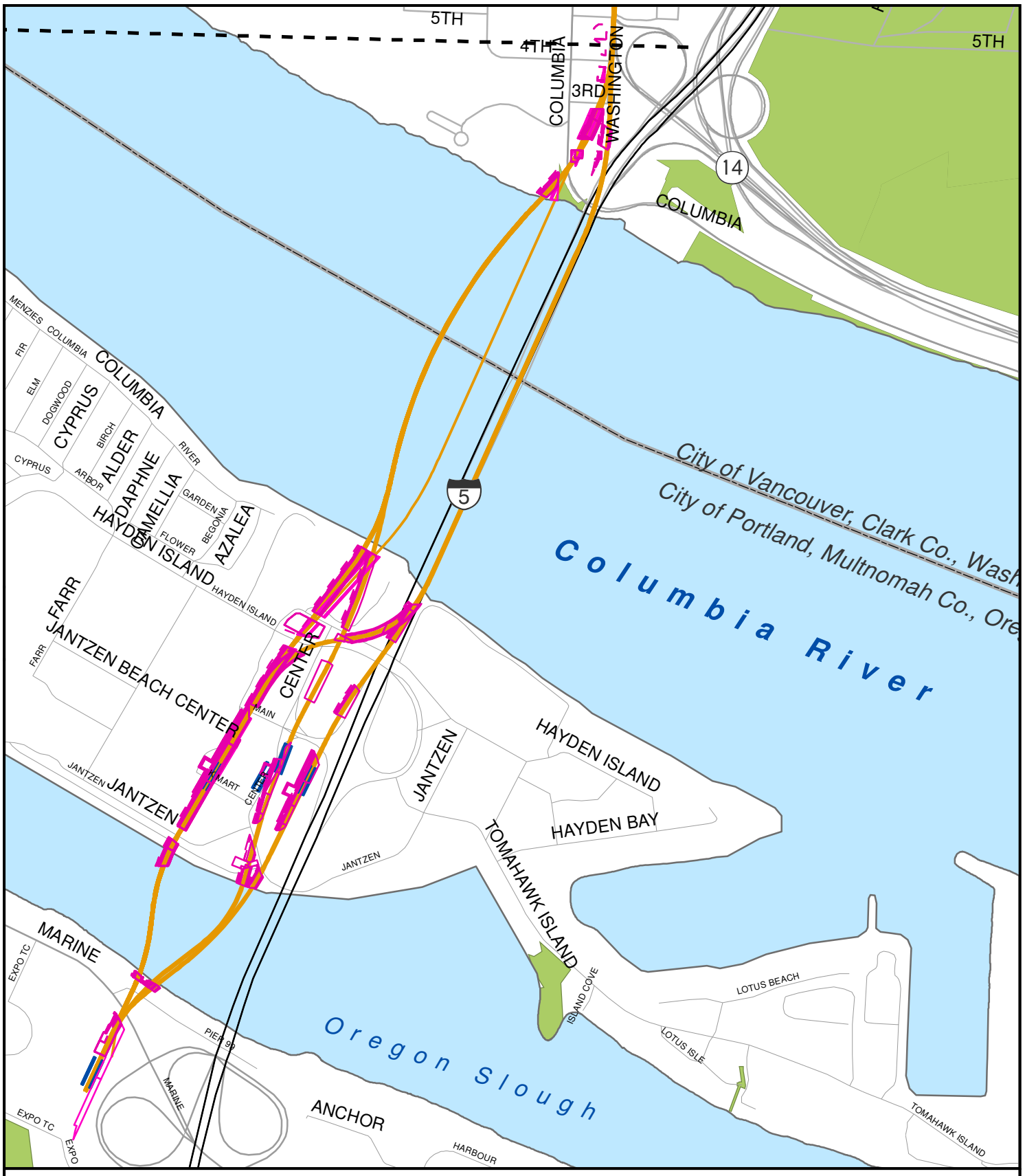


Exhibit 5-7: Right-of-Way Requirements for Transit Options
Segment A1

Columbia River CROSSING

Analysis by J. Koloszar; Analysis Date: Nov-2007; Plot Date: Nov-2007; File Name: RoadAlignments_MK089.mxd

The differences in acquisitions between BRT and LRT options are summarized below and not repeated in Sections 5.3.3.1 and 5.3.3.2.

BRT and LRT would affect the same number of parcels in Segment A1, with the exception of the offset alignment for BRT, which would affect one additional parcel in Oregon, on the south side of the North Portland Harbor. Although the number of parcels affected is similar between options, the acreage impacts are higher under BRT than LRT across all alternatives. BRT would require more acreage for the Expo Center station, where there would be bus queuing and the potential for HCT users to transfer to LRT.

5.3.3.1 Segment A1: I-5 Adjacent Alignment

The adjacent transit alignment would require between 2.3 and 3.5 acres of right-of-way (including 0.1 to 0.7 acres of ODOT-owned land) acquisition in Oregon, primarily on Hayden Island. The adjacent alignment when paired with the supplemental roadway alignment would require the less acreage than the pairing of adjacent transit alignment with the downstream roadway alignment would require the most. In Oregon, the I-5 adjacent transit alignment would require full or partial acquisition of 10 to 18 parcels, depending on the roadway alternative selected. Between seven and eight of these acquisitions could have building impacts, most of which contain multiple businesses. In addition, the supplemental adjacent alignment options would have impacts to eight floating homes in North Portland Harbor south of Hayden Island. These homes would need to be moved from their current locations. There are no additional displacements of floating homes when the downstream replacement alternative is paired with the adjacent alignment.

There is only one full acquisition associated with the I-5 adjacent alignment in Segment A1 in Washington. That is the acquisition of a vacant lot owned by the State of Washington (not currently used as highway right-of-way). This acquisition would not occur with the supplemental bridge. There are a few additional partial acquisitions in Vancouver, totaling 0.2 to 0.5 acres for the adjacent alignments, depending on the roadway alternative selected, and may result in up to one building impact.

BRT and LRT would affect the same number of parcels in Segment A1 for the various adjacent alignment options. BRT would require additional acreage compared to LRT in Segment A1, ranging from 3.1 to 3.5 acres for BRT, compared to 2.2 to 3.0 for LRT.

5.3.3.2 Segment A1: Offset Alignment

In Oregon, the I-5 offset transit alignments would require full or partial acquisition of eight or nine parcels, depending on the roadway alternative selected. One or two of these acquisitions could have building impacts. The offset alignment associated with either river crossing would result in the displacement of up to 7 additional floating homes on Hayden Island. These homes would need to be moved from their current locations.

As mentioned above, BRT and LRT would affect the same number of parcels in Segment A1, with the exception of two minor variations associated with the offset alignment in Oregon:

- The offset alignment, when paired with the downstream replacement bridge, would require one more partial acquisition in Oregon for LRT than for BRT.
- The offset alignment, when paired with the supplemental bridge, would require one more partial acquisition in Oregon for BRT than for LRT.

In Oregon, the offset transit alignment options would be associated with 2.6 and 3.7 acres of right-of-way acquisitions, primarily on Hayden Island. The offset transit alignment would have less impact when paired with the supplemental river crossing.

In Washington, there is only one full acquisition with the transit options associated with the replacement bridge in Segment A1. There are no full acquisitions for transit when associated with the supplemental bridge option. The full acquisition for the replacement bridge would be a vacant lot owned by the State of Washington. There would be a few additional partial acquisitions in Vancouver, totaling 0.2 to 0.6 acres for the different offset alignments, depending on the roadway alternative selected, and may result in up to one building impact.

In total, BRT would require additional acreage compared to LRT in Segment A1, ranging from 3.7 to 4.2 acres for BRT, compared to 2.9 to 3.7 for LRT.

5.3.3.3 Segment A1: Combined Roadway and Transit Impacts to Hayden Island

Between 13 and 23 floating homes on Hayden Island would be relocated under any of the build alternatives. Exhibit 5-8 shows the potential numbers of floating homes that would need to be relocated under the current designs for each project alternative. These numbers reflect the current designs and occupancies of the slips on Hayden Island.

Exhibit 5-8. Potential Floating Home Relocation

	Adjacent Transit Alignment Total (Roadway, Transit)	Offset Transit Alignment Total (Roadway, Transit)
Downstream Replacement Bridge	13 (13, 0)	20 (13, 7)
Supplemental Bridge	23 (15, 8)	22 (15, 7)

5.3.4 Segment A2: South Vancouver to Mill Plain District - Transit Alternatives

The transit options in Segment A2 would have relatively few acquisitions. The transit alignment impacts are generally the same through Segment A2, with variation between options occurring at the northern end of the segment. In fact, neither the two-way Washington Street option nor Washington-Broadway couplet would have any right-of-way acquisitions through Segment A2, until they reach the area where the alignment must transfer to a different street or set of streets before continuing into Segment B. These options include transferring to the Vancouver alignment (traveling along Main and/or Broadway) or the I-5 alignment (traveling to I-5 via 16th Street or McLoughlin Boulevard). The following is a breakdown of the right-of-way acquisitions resulting from the combination of these transit options.

Exhibits 5-9 and 5-10 describe the transit related acquisitions in segment A2. Exhibit 5-11 shows the potential right-of-way needs associated with the transit options in Segment A2. BRT could avoid some of the right-of-way acquisition need as it can stay within existing right-of-way in select areas where light rail cannot.

Exhibit 5-9. Summary of Right-of-Way Requirements for Vancouver Alignments Transit Options, Segment A2 (Number of Parcels, Acres)

Mode	Option Combination	Acquisition Level	Parking Parcels	Acres of Parking	Retail/ Services Parcels	Acres of Retail Services	Total Acquisitions	Parcels with Building Impacts	Total Acres
LRT	Two-way Washington to Two-way Broadway	Full	5	0.4	0	0	5	0	0.4
		Partial	0	0	7[a]	0.4	7	1	0.4
	Total	Total	5	0.4	7	0.4	12	1	0.8
	Washington/Broadway to Two-way Broadway	Full	5	0.4	0	0	5	1	0.4
		Partial	0	0	8	0.9	8	0	0.9
	Total	Total	5	0.4	8	0.9	13	1	1.3
	Two-way Washington to Broadway/Main	Full	5	0.4	0	0	5	0	0.4
		Partial	0	0	7	0.3	7	0	0.3
	Total	Total	5	0.4	7	0.3	12	0	0.7
	Washington/Broadway to Broadway/Main	Full	5	0.4	0	0	5	0	0.4
		Partial	0	0	1	<0.1	1	0	<0.1
	Total	Total	5	0.4	0	< 0.1	6	0	0.4

[a] One Building Impact.

Exhibit 5-10. Summary of Right-of-Way Requirements for I-5 Alignments Transit Options, Segment A2

Mode	Option Combination	Acquisition Level	Parking	Acres of Parking	Retail/ Services	Acres of Retail/ Services	Office/ Professional/ Health Care	Acres of Office/ Professional/ Health Care	Park/ Historic Site/ Museum	Acres of Park/ Historic Site/ Museum	Total Acquisitions	Total Acres
BRT	Two-way Washington to McLoughlin	Full	3	0.1	0	0	0	0	0	0	3	0.06
		Partial	0	0	4[a]	0.1	0	0	0	0	4	0.10
	Total		3	0.1	4	0.1	0	0	0	0	7	0.17
	Two-way Washington to 16th	Partial	5	0.4	0	0	1	< 0.1	1	< 0.1	2	< 0.5
	Total		5	0.4	0	0	1	< 0.1	1	< 0.1	2	unknown
	Washington/Broadway to McLoughlin	Full	5	0.4	8[a]	0.9	0	0	0	0	13	1.3
	Total		5	0.4	8	0.9	0	0	0	0	13	1.3
	Two-way Washington to 16th	Full	5	0.4	0	0	1	< 0.1	1	< 0.1	7	< 0.5
	Total		5	0.4	0	0	1	< 0.1	1	< 0.1	7	< 0.5
	Washington/Broadway to 16th	Full	5	0.4	0	0	1	< 0.1	1	< 0.1	7	< 0.5
	Total		5	0.4	0	0	1	< 0.1	1	< 0.1	7	< 0.5

[a] One Building Impact (U.S. Bank).

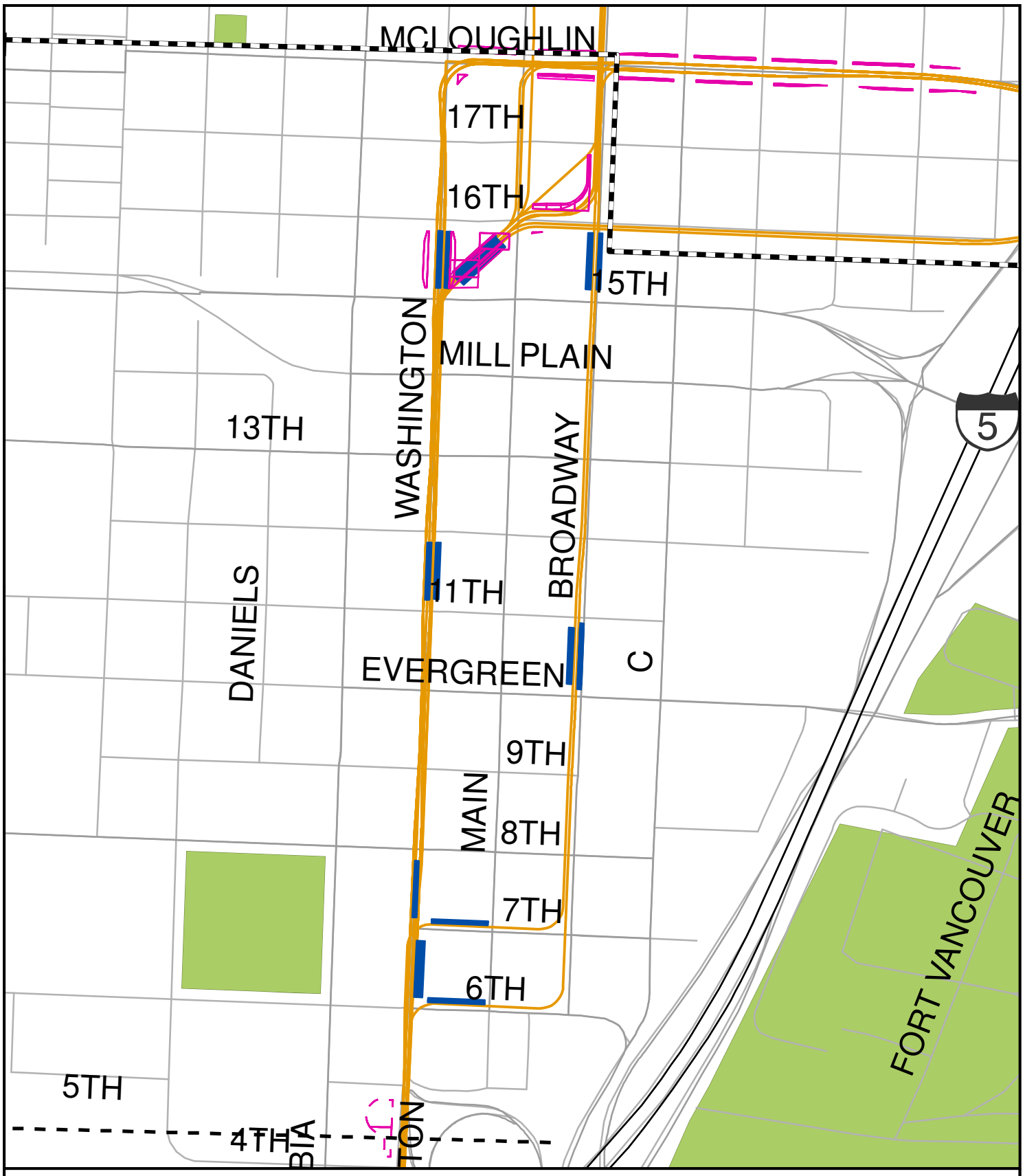


Exhibit 5-11: Right-of-Way Requirements for Transit Options
Segment A2

Columbia River CROSSING

Analysis by J. Koloszar; Analysis Date: Nov-2007; Plot Date: Nov-2007; File Name: RoadAlignments_MK089.mxd

5.3.4.1 Vancouver Alignments

For LRT, the two-way Washington alignment would have little difference in acquisitions whether the alignment transitions to a Broadway-Main couplet or a two-way Broadway option in Segment B (Exhibit 5-9). For LRT, the acquisitions resulting from Washington-Broadway couplet are similar whether the alignment transitions to a Broadway-Main couplet or a two-way Broadway option in Segment B. Both are associated with the full acquisition of five parcels currently supporting parking, for a total of 0.4 acres. A transition to the two-way Broadway alignment would require an additional eight partial acquisitions of parcels serving as retail/service parcels, for a total of up to 1.3 acres. A transition to the Broadway-Main option would result in the acquisition of up to 0.7 acres.

For BRT, transitions to the Vancouver alignments (i.e., exit Segment A2 traveling up Main Street and/or Broadway) would require no right-of-way acquisitions until it reaches the Mill Plain area. This is due to the fact that BRT can largely travel in the existing right-of-way. These impacts are described in Exhibit 5-10.

Station design in this area would result in a varying amount of right-of-way need and, more important, varying types of uses and building design that could be made available on remaining parcels. Exhibit 5-12 shows potential configurations of the station in the northern end of Segment A1.

5.3.4.2 I-5 Alignments

For LRT, acquisitions would occur for all options using the I-5 alignment. One of the partial acquisitions would result in some building impact (Exhibit 5-9). A transition from the Washington-Broadway couplet to McLoughlin would result in the full acquisition of five parcels used for parking and eight retail/services parcels, for a total area of 1.3 acres. For both major alignments in Segment A2 (two-way Washington and Washington-Broadway couplet) transitions to 16th Street would result in the full acquisition of five parcels used for parking (0.4 acres), and the partial acquisition of one parcel serving as an office and one parcel serving as an historical museum (neither the office nor the historic museum would be displaced).

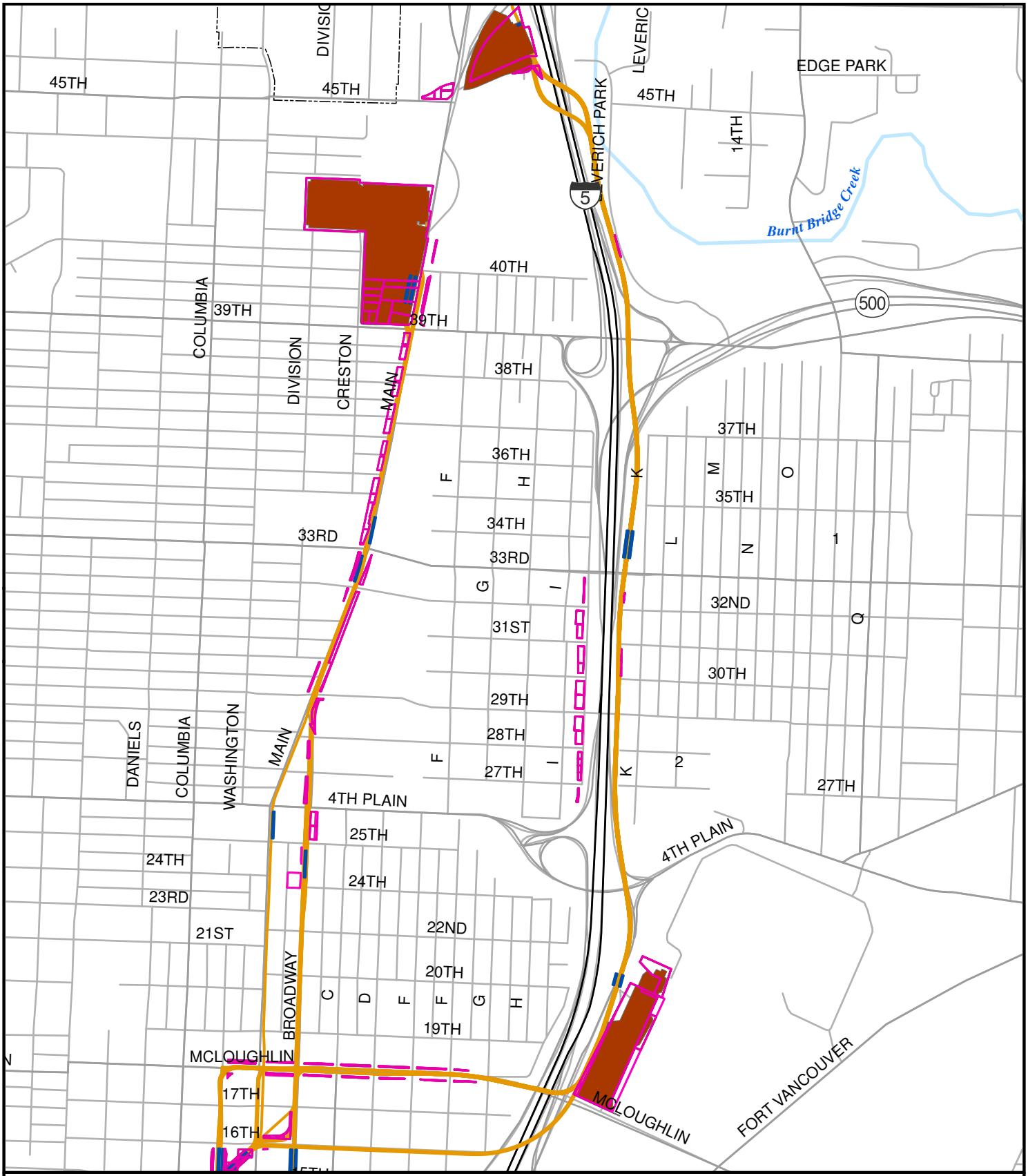
For BRT, acquisitions for the I-5 alignment are limited to the transition area between the two-way Washington option connecting via 16th Street or McLoughlin Boulevard. The option of McLoughlin would result in the full acquisition of three parcels used for parking and the partial acquisition of four retail/service parcels, for a total area of 0.17 acres. One of the retail/services acquisitions would result in a building impact. The 16th Street option, on the other hand, would result in the partial acquisition of one parcel serving as an office, and the partial acquisition of one parcel serving as an historical museum. Neither of these acquisitions would result in any impact to the buildings on these parcels, as the buildings can be avoided through design. These impacts are described in Exhibit 5-10.

Exhibit 5-12. Mill District Station Design Optimized

5.3.5 Segment B: Mill Plain District to North Vancouver - Transit Alternatives

The transit options in Segment B have right-of-way needs ranging from 9.7 to 25.2 acres (including 7.7 to 11.2 acres of DOT land), depending on alignment. There are no differences in the right-of-way needs between BRT and LRT within Segment B. The Vancouver alignments require more right-of-way than the I-5 alignments due in large part to the addition of the Lincoln Park and Ride, which, under current design, would require the acquisition of 12 parcels and 17 acres. Twelve of the 17 acres for the Lincoln Park and Ride are currently in use as a WSDOT maintenance facility. Both alignments also include the Kiggins Bowl and Clark College Park and Rides.

Exhibit 5-13 shows the potential right-of-way needs associated with the transit options in Segment B.



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Transit RoW Requirements
Transit Lines
Park and Ride
Transit Station

Exhibit 5-14: Right-of-Way Requirements for Transit Options
Segment B

Columbia River CROSSING

Analysis by J. Koloszar; Analysis Date: Nov-2007; Plot Date: Nov-2007; File Name: RoadAlignments_MK089.mxd

5.3.5.1 Vancouver Transit Alignments

The Vancouver transit alignments are associated with between 15 and 16 full parcel acquisitions and 48 to 50 partial acquisitions, depending on alternative. These account for between 24.7 and 25.1 acres of additional right-of-way (including 14 acres of WSDOT-owned property). Exhibit 5-14 illustrates the range of acquisitions associated with each transit alignment option in Vancouver.

Exhibit 5-14. Segment B: Mill Plain District to North Vancouver – Vancouver Alignments

Measure	Two-way Broadway	Broadway-Main Couplet
Full Parcels	15	16
Partial Parcels	48	50
Total Parcels	63	66
Building Impacts	17	16
Total Acres	24.7[a]	25.1[a]

[a] Includes 14 acres of WSDOT-owned property.

The park and ride facilities at Lincoln (45th Street), Clark College, and Kiggins Bowl would be developed for either the LRT or BRT options, under any of the potential Vancouver transit alignments.

The Lincoln Park and Ride is associated with 12 full acquisitions. The full acquisitions are a Washington transportation maintenance facility (approximately 12 acres), unused land associated with the State facility, a convenience store, a vacant lot associated with the convenience store, two multi-family residences, and five single family residences.

The Kiggins Bowl Park and Ride is associated with the partial acquisition of one parcel and the full acquisition of a WSDOT-owned parking lot north of Kiggins Bowl playing fields. full acquisition of three parcels and partial acquisitions of five parcels. The Kiggins Bowl Park and Ride would result in building impacts to two retail buildings and one residence.

The Clark College Park and Ride is associated with acquisitions from three parcels, owned by the WSDOT, Clark College, and the Veterans Administration (VA) Campus (home to the Clark County Center for Community Health). One building would be impacted with the development of the Clark College Park and Ride—a small building previously used as a visitor center for the former WSDOT rest stop, and now used for storage by Clark College.

5.3.5.1.1 Two-Way Broadway: Vancouver Alignment

The acquisitions needs for the Vancouver alignment using two-way Broadway are summarized in Exhibit 5-15 below. In total, 15 full acquisitions would be required for this alignment and there would be 17 building impacts. These data include the right-of-way needed for the two park and ride facilities associated with the Vancouver transit alignments.

Exhibit 5-15. Two-Way Broadway: Acquisitions for Segment B

	Single-Family	Multi-Family	Retail/ Services	Office/ Professional	Civic	Vacant/ Parking	Other	Total
Full Parcels	5	2	2	0	1	5	0	15
Partial Parcels	0	1	14	25	0	4	4	48
Total Parcels	5	3	13	24	1	9	7	62
Building Impacts	5	3	4	4	1	0	0	17

5.3.5.1.2 Broadway – Main Couplet: Vancouver Alignment

The acquisitions needs for the Vancouver alignment using a Broadway – Main couplet are summarized in Exhibit 5-16 below. In total, 16 full acquisitions would be required for this alignment and there would be 17 building impacts. These data include the right-of-way needed for the two park and ride facilities associated with the Vancouver transit alignments.

Exhibit 5-16. Broadway – Main Couplet: Acquisitions for Segment B

	Single-Family	Multi-Family	Retail/ Services	Office/ Professional	Civic	Vacant/ Parking	Other	Total
Full Parcels	5	2	2	1	1	5	0	16
Partial Parcels	0	1	17	25	0	3	6	50
Total Parcels	5	3	19	26	1	8	6	66
Building Impacts	5	3	3	4	1	0	0	16

5.3.5.2 North I-5 Transit Alignments

The North I-5 transit alignments follow the east side of I-5 and terminate at the Kiggins Bowl Park and Ride. The transition from Segment A would follow either 16th Street or McLoughlin Boulevard across I-5, and then turn north. There are two sources of differences in the acquisition needs for these alternatives. The acquisitions vary depending on the use of 16th or McLoughlin to travel east-west between the Mill Plain District and I-5, and if the transit alternative is paired with the replacement or the supplemental crossing option. Exhibit 5-17 summarizes the range of acquisitions associated with each transit alignment option along I-5.

Exhibit 5-17. Segment B: Mill Plain District to North Vancouver – I-5 Alignments

Measure	16th Street	McLoughlin Boulevard
Full Parcels	3 - 8	3 - 8
Partial Parcels	29 - 33	54 - 58
Total Parcels	32 - 41	57 - 66
Building Impacts	3 - 10	6 - 12
Acres	9.7 - 10.6[a]	10.0 - 10.8[a]

[a] Includes 2 acres of WSDOT-owned property.

The park and ride facilities at Clark College and Kiggins Bowl would be developed for either the LRT or BRT options, under any of the potential I-5 transit alignments.

With the I-5 alignment, the Kiggins Bowl Park and Ride would be associated with the full acquisition of three parcels and partial acquisitions of five parcels, resulting in building impacts to two retail buildings and one residence. This park and ride would have greater impacts associated with it as the terminal park and ride for the I-5 alignment than a satellite lot for the Vancouver alignment, because it would require the Main Street and 45th Street intersection to be realigned to accommodate a substantial increase in traffic to the park and ride.

The I-5 alignment would also include the Clark College Park and Ride as described in section 5.3.5.1 Vancouver Transit Alignments.

The remainder of this section describes the differences in the I-5 alignment transit options in Segment B.

5.3.5.2.1 16th Street: I-5 Alignment

The acquisitions needs for any of the 16th Street alignments (entering from two-way Washington or the Washington-Broadway option, and BRT or LRT) are summarized below. These data include the right-of-way needed for the two park and ride facilities associated with the I-5 transit alignments. Exhibit 5-18 summarizes the types of uses associated with the acquisitions and building impacts anticipated for the 16th Street alignment in Segment B (including the two-way Washington or Washington-Broadway transition areas). In total, 9.7 to 10.6 acres (including 2 acres of WSDOT-owned property) would be required for this alignment. Less right-of-way would be needed if the supplemental bridge is paired with the high capacity transit alternative.

Exhibit 5-18. Acquisitions for 16th Street Alignment: Segment B

	Multi-Family	Single-Family	Office	Retail/ Services	School	Park/ Museum/ Historic Site	Parking/ Vacant	Total
Full Parcels	0 - 1	0 - 4	0	2	0	0	1	3 - 8
Partial Parcels	0 – 2	13 - 19	3	5	2	2	2	29 - 33
Total Parcels	1 – 2	13 - 23	3	7	2	2	3	32 - 41
Building Impacts	0 - 1	2 - 8	0	2	0	0	0	4 - 11

5.3.5.2.2 McLoughlin Boulevard: I-5 Alignment

The acquisitions needs for any of the McLoughlin alignments (entering from two-way Washington or the Washington-Broadway option, and BRT or LRT) are the same and are summarized below. These data include the right-of-way needed for the two park and ride facilities associated with the I-5 transit alignments. Exhibit 5-19 illustrates the types of uses associated with the acquisitions and building impacts anticipated for the McLoughlin Alignment in Segment B (including the two-way Washington or

Washington-Broadway transition areas). In total, 10.0 to 10.8 acres (including 2 acres of WSDOT-owned property) would be required for this alignment. Less right-of-way would be needed if the supplemental bridge is paired with the high capacity transit alternative.

Exhibit 5-19. Acquisitions for McLoughlin Alignment: Segment B

	Multi-Family	Single-Family	Office	Retail/ Services	School	Park/ Museum/ Historic Site	Parking/ Vacant	Total
Full Parcels	0 - 1	0 - 4	0	2	0	0	1	3 - 8
Partial Parcels	1 - 2	24 - 29	13	6 - 9	2	2	2	54-55
Total Parcels	2	24 - 33	13	8 - 11	2	2	3	57-63
Building Impacts	0 - 1	2 - 8	1	3	0	0	0	6-13

5.4 Impacts from Other Project Elements

5.4.1 Minimum Operable Segment

The Clark College minimum operable segment (MOS) for transit would proceed east out of the Mill District (via 16th Street or McLoughlin Boulevard) and terminate at the Clark College Station. This would avoid the potential acquisitions associated with Segment B north of Clark College, including those associated with the intersection at 45th and Main street for the Kiggins Bowl Park and Ride station. Acquisitions in Segment B are described in Section 5.3.4.3, North I-5 Transit Alignments. Building impacts to three retail buildings and 2 to 8 residential displacements and 15 partial acquisitions would be avoided under the MOS.

The Mill Plain minimum operable segment (MOS) for transit would terminate between Mill Plain and McLoughlin Boulevards. The terminal station would be located at 15th and Washington Street. For BRT, no acquisitions, in addition to those for the park and rides, are anticipated because the transit line will stay on the city streets. For LRT, the station would be located within the block bordered by 15th, 16th, Washington, and Main Streets. This block is currently used for parking. Except for the park and rides, this MOS would avoid all acquisition impacts in Segment B.

The Clark College, Kiggins Bowl, and a reduced size Lincoln Park and Ride would all be included with the Mill Plain MOS. Like the Clark College MOS, the Mill Plain MOS would not require the reconfiguration of the intersection at 45th and Main Street, thereby avoiding some impacts. The Mill Plain MOS could also require additional park and rides at 5th and Columbia Streets and 16th and Main Streets. Both Park a rides would impact buildings with retail/service uses.

The expansion of the transit maintenance bases (BRT in Vancouver; LRT in Gresham) would not be reduced in size under the MOS. For more information on the transit maintenance stations, see Section 5.4.2, Transit Maintenance Base Options.

5.4.2 Transit Maintenance Base Options

Alternatives utilizing BRT would require the expansion of the existing C-TRAN bus maintenance facility in east Vancouver. Alternatives utilizing LRT would require the expansion of the existing TriMet Ruby Junction maintenance facility in Gresham.

5.4.2.1 LRT Maintenance Base Options

TriMet's existing Ruby Junction maintenance base in Gresham would be expanded to support the extra light rail service under all LRT options. The maintenance facility would require the full acquisition of 14 parcels. The zoning in this area is heavy industrial. The land use on these parcels is residential and commercial. The area to the south is an active gravel pit. The 14 parcels currently support up to seven single-family residences and eight to nine parcels containing a mix of service and light industrial uses. One of the single-family residences and one of the buildings appeared to be vacant on a February 29, 2008 site visit.

Approximately half of the expansion would be to serve CRC LRT vehicles. The remainder of the expansion would be for increased demand elsewhere in the LRT system, though the entire footprint is necessary to develop the track connections for even a smaller expansion and to make the required changes in the roadway.

5.4.2.2 BRT Maintenance Base Options

C-TRAN's existing maintenance base in east Vancouver would be expanded to support the BRT alternatives. The maintenance facility would require the full acquisition of five parcels. The parcels are zoned for light industrial use and currently support two single-family residences, one manufacturing business, one vacant lot, and one lot with three buildings that appear vacant or used for storage. Part or all of the last lot was posted for sale during the site visit on August 30, 2007.

5.5 Impacts from Individual System-Level Choices

5.5.1 River Crossing Type and Capacity: How does the supplemental crossing compare to the replacement crossing?

The replacement bridge would require generally more acquisitions in terms of number of parcels, building impacts, and total acreage than the supplemental bridge. Though subtracting the DOT right-of-way from the totals results in a similar impact – 26.1 acres with the supplemental river crossing and 29.6 to 30 acres with the replacement river crossing. Exhibit 5-20 summarizes the acquisition needs (full parcels, total parcels, and acreage) for the downstream replacement and supplemental bridge options.

Exhibit 5-20. Acquisition Requirements by River Crossing Type

Downstream	Full Acquisitions (Parcels)	Displacements (Parcels with Building Impacts)	Total Acquisitions (Parcels)	Acres
Segment A	18	18	82	36.9
Segment B	0	4 - 5	33 - 41	2.3 - 2.7
Total	18	22 - 23	115 - 123	39.2 - 39.6[a]
Supplemental	**Full Acquisitions (Parcels)**	**Displacements (Parcels with Building Impacts)**	**Total Acquisitions (Parcels)**	**Acres**
Oregon	16	19	66	26.1
Washington	0	0	27 - 33	2.0
Total	16	19	93-99	28.1[b]

[a] This includes 9.6 acres of DOT-owned right-of-way.

[b] This includes 2 acres of DOT-owned right-of-way.

In Washington, the supplemental crossing would avoid some residential impacts in Vancouver that would occur under the replacement bridge scenario. The replacement bridge would avoid some retail impacts that would occur under the supplemental bridge scenario.

5.5.2 Transit Mode: How does BRT compare to LRT?

The most significant difference in property acquisitions between the two transit mode options is the location of the maintenance facility. BRT would require an expanded maintenance base in Vancouver, while the LRT option would require an expanded maintenance base in Gresham. For more information, see Section 5.4.2, Transit Maintenance Base Options.

Other than the maintenance bases, there are several minor or moderate differences in the acquisition requirements between BRT and LRT options. In Oregon, the BRT alternatives would require an expanded bus parking and turnaround area at the Expo Center. The LRT option would not require this additional area. Additionally, BRT, when paired with the I-5 alignment could result in an additional 0.35 acre impact to the parcel that houses the Discovery Middle School and Kiggins Bowl.

Additionally, the transit alternatives would require different acquisitions depending on mode (LRT v. BRT) and station design in Segment A2. The alignment for light rail transit, which must allow for wider turns than bus rapid transit, could affect the parcels currently supporting the U.S. Bank building at Main Street and 17th, as well as other small acquisitions where LRT needs to turn from one street (or set of streets) to another. LRT could cut through the U.S. Bank building block, while BRT could navigate on existing roadway, requiring less right-of-way. In some instances BRT could result in the displacement of the Wells Fargo bank at Main Street and McLoughlin Boulevard due to the realignment of the intersection to accommodate a fixed HCT guideway.

LRT could also be designed to avoid acquiring this block although it would require tight radius turns in the trackway and partial property acquisitions at the block corners. Different station designs are possible depending on city and developer preferences, and

could result in the BRT alignment mimicking that for LRT. The station design that would allow for better pedestrian access and visibility, with a station in the middle of the block, would require the relocation of the US Bank building because the transit line would cut diagonally through the block. An alternate design would allow transit to follow the existing roadway and would require the acquisition of an area used for parking, but not the US Bank Building. This design would result in the north/south stations being separated on either side of the block.

5.5.3 Balance of Transit vs. Highway Investment: Increased Transit System Operations with Aggressive TDM/TSM Measures, and Efficient Transit System Operations with Standard TDM/TSM Measures

There are no anticipated differences in acquisitions related to the different transportation demand management (TDM) or transportation system management (TSM) options.

5.5.4 Major Transit Alignment: How does the Vancouver alignment compare to the I-5 alignment?

The transit options in Segment B have right-of-way needs ranging from 9.7 to 25.2 acres (including 2 to 14 acres of DOT-owned land), depending on alignment. Generally, the Vancouver alignments would require more right-of-way than the I-5 alignments. This is largely due to the addition of the Lincoln Park and Ride, which would require the acquisition of 11 parcels and 17 acres (including 12 acres of DOT-owned land). See Section 5.3.5, Segment B: Mill Plain District to North Vancouver – Transit Alternatives, for more detail.

5.5.5 Tolling: How do the tolling options compare (no toll, standard or higher toll on I-5, toll on both I-5 and I-205)?

There are no anticipated differences in acquisitions related to the different tolling options.

5.5.6 Transit Project Length: How do the full-length alternatives compare to the shorter length option?

The full-length alternatives are generally associated with more acquisitions than the shorter length option. This is somewhat offset by the fact that the MOSs are associated with similar or more park and rides throughout the project area. See Section 5.4.1, Minimum Operable Segment, for more information.

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6. Temporary Effects

6.1 Introduction

Temporary easements under any of the build alternatives would be needed for project construction. These easements would be short term and the property would be restored to the landowner after construction is complete.

6.2 System-wide Impacts

Temporary easements would be needed for project construction under any of the roadway alternatives of approximately 1.0 to 1.6 acres and of 0.5 to 1.5 acres under any of the transit alternatives. Exhibit 6-1 shows the estimated construction easements required under the various alternatives.

Exhibit 6-1. Temporary Construction Easements (Acres)

	Oregon	Washington	Total[a]
Roadway Downstream	0.9	0.7	1.6
Roadway Supplemental	0.5	0.5	1.0
Transit – Offset	0.9 – 1.0	0.2 – 0.4	1.0 – 1.4
Transit – Adjacent	0.3 – 0.4	0.2 – 0.4	0.5 – 0.8
Transit – 16th	N/A	<0.1 – 0.1	<0.1 – 0.1
Transit - Main	N/A	0	0

[a] Numbers do not sum due to rounding.

With the exception of two properties, all properties that would be used for construction easements under any of the transit or roadway scenarios would also be subject to some level of acquisition. The two exceptions are a multi-family residence in Segment B associated with the roadway alternatives and a retail/services building in Segment A. Both of these properties would require construction easements with the replacement river crossing.

Along the transit alignment, it may be necessary to seek temporary construction easements or small permanent easements on adjacent properties to allow construction workers to enter the first several feet of a property while rebuilding the sidewalk in front of the property or to place specific elements such as an overhead catenary pole behind the sidewalk.

In addition, project construction will require staging areas for storing and preparing materials and equipment. These would require temporary easements or use of small as well as large parcels, including a staging area on the river for materials and equipment needed to construct the bridge. Property used during construction could be returned to its owner once construction is complete, or alternatively, if the site is accessible to transit,

the land might instead be purchased at a fair market value and then developed with transit-oriented uses, such as retail, residential, or mixed use.

It is too early in the design process to know whether a large casting yard and staging site will be needed for the construction of the river crossing. However, if the pre-casting construction technique is used, desirable site characteristics are likely to include:

- A large (at least 15 acres) open site suitable for heavy machinery and casting of bridge segments,
- Waterfront property with access for barges to convey material to the construction zone, and
- Roadway or rail access for landside transportation of materials by truck or train.

The acquisition of a large casting yard and staging site could result in additional displacements, which would be appropriately mitigated at described in the Potential Mitigation discussion below.

Activities occurring on any of the potential casting and staging sites would be in accordance with federal, state, and local environmental regulation and land use code. Depending on the construction requirements of the project, the project may need to obtain variances for some or all of these local codes.

6.2.1 Airspace Rights and Subsurface Easements

As the construction plan is developed, the project will need to identify all locations where temporary airspace rights or easements or subsurface easements would be required. A temporary easement conveys certain property rights, but not ownership, to a parcel of real estate for a defined period of time. The temporary easement provides its holder with specified rights to use the easement area. Temporary airspace easements may be acquired for construction over locally-owed roads, the interstate, or the railroad, while subsurface easements may be required for utility relocation.

The project may need to obtain a temporary airspace easement from the Burlington Northern Santa Fe Railway (BNSF) for the construction of the project over the mainline. BNSF has requirements for access to and construction over its property. Project staff would need to work with BNSF to determine specific construction and safety requirements and access permits needed as the construction plan is developed. Additionally, an agreement between BNSF and the project may be developed before the FEIS that will identify any terms and conditions for construction.

Project staff would work with the cities of Portland and Vancouver land use, transportation, and development staff to determine specific permitting and easement requirements. These requirements are typically determined during the development review process in each city. Memoranda of understanding may be used by city, county, or state project participants to determine how issues related to easements, access, etc. would be handled.

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7. Mitigation for Long-Term Effects

During the planning and project selection process, the project designers attempt to avoid and minimize potential acquisition impacts by modifying alignments, shifting alignments or moving transit stations as possible. These shifts will be conducted to minimize acquisition needs and to avoid undesirable building and access impacts. Right-of-way business displacements, losses in parking, and changes in access identified in this report are based on preliminary conceptual designs for the build alternatives. More detailed design for any of the alternatives will seek to reduce the amount of land that must be acquired for right-of-way and to avoid acquiring businesses where possible. However, where impacts are unavoidable, the right-of-way acquisition team will work to compensate landowners financially.

Most aspects of mitigation for property acquisition and residential and business relocations are addressed by federal and state regulations, which require that property be purchased at fair market value, and that all residential displacees be provided decent, safe, and sanitary replacement housing. Federal and state guidelines, such as the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended), determine the standards and procedures for providing such replacement housing, based on the characteristics of individual households.

Relocation benefit packages usually include replacement housing for owners and renters, moving costs, and assistance in locating replacement housing. Similarly, relocation benefits for businesses include moving costs, site search expenses and business re-establishment expenses. As with residential displacees, the specifics of a relocation package are determined on an individual basis determined by ownership or tenant status. In general, attempts would be made to minimize relocation impacts to residences, businesses, and public facilities. Additionally, because the project straddles two states and multiple city and county jurisdictions, the project team will work to reduce or eliminate possible discrepancies between the state and local practices on acquisition and relocation activities. During this process, the team will also strive to ensure uniformity and equity to all affected owners and occupants.

The US General Services Administration may be involved in any property acquisition related to the acquisition of federally-owned property, such as the property owned by FHWA Western Federal Lands. Additionally, the acquisition of property owned by the US Army, such as that near the SR-14 interchange, would require consultation with the Defense Base Closure and Realignment Commission (BRAC).

Eligibility and terms of relocation assistance will be determined by the real estate team during future project planning.

7.1 Relocation: Availability of Housing Properties

As illustrated in Section 4, housing is available throughout the Portland-Vancouver metropolitan area. It is reasonable to assume that there will be sufficient relocation

possibilities for residents that would be affected by the proposed project, with the possible exception of some of the residents of floating homes on Hayden Island.

Between 13 and 23 floating homes on Hayden Island would be relocated under any of the build alternatives. Exhibit 7-1 shows the potential numbers of floating homes that would need to be relocated under the current designs for each project alternative. These numbers reflect the current designs and occupancies of the slips on Hayden Island.

Exhibit 7-1. Potential Floating Home Relocation

	Adjacent Transit Alignment Total (Roadway, Transit)	Offset Transit Alignment Total (Roadway, Transit)
Downstream Replacement Bridge	13 (13, 0)	20 (13, 7)
Supplemental Bridge	23 (15, 8)	22 (15, 7)

There are limited opportunities to relocate floating homes in the region. Many floating home marinas in the immediate area operate at capacity. Additionally, some floating homes do not have sufficient structural integrity to support a move, either within or between marinas. The displacement of floating home s in the North Portland Harbor could be mitigated through relocation of displaced homes and residents in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended). Ideally, relocations would be near their original location, although this may not be possible. These relocations could potentially occur in the following ways:

- Purchase or build a marina and build new slips, although this would likely be difficult because of the potential impacts to ESA-protected fish species from a new facility or additional slips.
- Work with a marina/moorage to add slips, although this could run into the same difficulties as above.
- Purchase low-value floating homes and replace them with newer homes that are comparable to ones displaced.
- Purchase and remodel floating homes to bring them up to standards for relocating displaced home owners.
- Find comparable “upland” housing, which would often provide displaced floating home owners with a relocation option that results in additional property value.
- Begin search for relocation opportunities early, so as to maximize the possibility of finding suitable relocation options. This would require early permission to purchase property, and the allocation of funds to do so.

All of these relocation ideas are preliminary. ODOT is currently investigation new ways to perform the relocation of displaced floating homes, with the first step being the identification of new marina locations.

7.2 Relocation: Availability of Business Properties

Up to 36 parcels with business uses would have potential displacements of those uses under the build alternatives. About half of the potential business impacts would be due to highway-related property impacts in Segment A. Many of these are on Hayden Island (up to 11 of 18 impacts to commercial buildings in Segment A). As discussed in other technical reports, Hayden Island is currently undertaking a master planning process, which could result in proposed land use and business structure changes on the island.

For the Vancouver businesses that may be displaced, it is reasonable to assume that replacement properties could be found, given current vacancy rates in the region as described in Section 4.

7.3 Relocation: Civic Services

The displacement of publicly owned facilities, such as the ODOT permit center, FHWA Western Federal Lands building, or WSDOT maintenance facility could be mitigated by functionally replacing the property acquired with another facility that would provide equivalent utility. Providing functional replacements could occur in lieu of paying the fair market value of the property.

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8. Mitigation for Temporary Effects

Mitigation for temporary effects will apply for those properties where construction easements are required. These include staging areas and other access needs related to the project construction. Construction easements under the different project alternatives and options are described in Section 6, Temporary Effects.

Mitigation for construction easements could include payment to property owners in exchange for the use of their property during construction. For example, one method for compensation would be to pay the equivalent of a "rental" based on the property appraisal. Improvements on-site are compensated according to market or contributory value.

Potential mitigation related to access control would also be needed for the project. Construction of any of the build alternatives has the potential to block access or make access to some locations difficult. The provision of continued access to properties during construction would be maximized to the extent possible.

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9. Permits and Approvals

No permits related to acquisitions, other than temporary street vacations or easements, are anticipated for this project.

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10. Sources

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