

## SECTION 4

# Additions and Changes to the Environmental Assessment

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This section documents additions and changes to the EA since its publication in December 2005. Additions and changes are organized into two major subsections. The first subsection consists of minor revisions. Text with strikeout (for example, ~~project~~) means the text has been deleted, and italicized text (for example, *project*) means the text is revised or new. The second subsection consists of new text that addresses more substantive comments on the following content areas: water resources, wetlands, air quality, and environmental justice.

## Minor Revisions

### Executive Summary

**Page 28-29, Final Paragraph.** The last sentence has been modified to read as follows:

*“Federally listed fish and sensitive fish species that ~~may~~ occur in the project area are: Chum salmon, steelhead, ~~and~~ Chinook salmon *and* coho, all listed as Threatened ~~and coho salmon, which is listed as Proposed Threatened.~~”*

**Page 29.** At the end of the first full paragraph, a sentence has been modified and a new sentence added:

*There are no federally listed wildlife species or species proposed for listing within the immediate project area, although a bald eagle nest is located approximately 2.5 miles to the west *near the great blue heron rookery. Additionally, bald eagles have been observed roosting in riparian trees adjacent to the Columbia Boulevard/I-5 on ramp.**

**Figure 7** is revised by reference to say that the blue heron rookery is 2.0 miles from the site rather than the ~~3.0~~ miles shown on the existing Figure 7.

**Figure 7** is revised by reference to say *Bald eagle nest 2.5 miles from the site.*

**Page 40,** final paragraph, second sentence has been modified to read:

*“~~There is no evidence to indicate that~~ *There is a possibility that* listed salmonids (salmon or steelhead trout that are species listed as threatened or endangered under the federal or state Endangered Species Act) are present within or immediately downstream of the project site.”*

**Page 40, final paragraph,** the following sentence has been added to the end of the paragraph:

*Critical habitat for steelhead and Chinook salmon has been designated in a portion of the Lower Columbia Slough downstream from the project area (70 FR 52630). Critical habitat has not been designated for coho or chum salmon in the Columbia Slough.*

## Environmental Assessment

**Page S 2:** Fourth paragraph has been changed to read:

The project would permanently remove 3.56 to 4.48 acres of ~~poor-quality~~ *degraded* wetland.

**Page 3-8,** first paragraph under heading “Fish” has been replaced, as follows:

~~Although water temperatures are usually too high and the dissolved oxygen content too low in the Columbia Slough to support year-round use by salmonids, the following fish can be found in the slough near Smith and Bybee Lakes: juvenile chum salmon, chinook salmon and, possibly, steelhead and cutthroat trout. New information provided by the City of Portland indicates that there is yearling and subyearling chinook and coho salmonid use of the Lower Columbia Slough from November through June when water temperatures are cool. It is possible that, on rare occasions, listed salmonids could occur in the slough in the project area. During the in-water work period (June 15 to September 15), salmonids are least likely to be in the project area. Previous studies have shown evidence of juvenile and adult salmonids in the Lower Columbia Slough.~~

*Although water temperatures and dissolved oxygen levels may prevent year-round use of the Lower Slough by salmonids, seasonal use by salmonids is documented through recent sampling performed by ODFW, Ducks Unlimited, and the City's ESA program. Fish have been documented using the Lower Slough from November to June. It is likely that salmonids can occur in the slough in the project area. Critical habitat for steelhead and Chinook salmon has been designated in a portion of the Lower Columbia Slough downstream from the project area (70 FR 52630). Critical habitat has not been designated for coho or chum salmon in the Columbia Slough.*

**Page 3-9,** first full paragraph, has been replaced, as follows:

~~In addition to water quality, other limiting factors for salmonids and trout in the Columbia Slough include lack of habitat complexity and diversity, lack of cover and presence of predators, poor substrate, and the lack of preferred food sources.~~

*The Slough provides salmonid refugia, primarily for out-migrating juveniles. It provides shelter from the high flows and river velocities found in the Willamette and Columbia river systems. The Slough also provides shelter, cover, and food sources consistent with uses as refugia habitat.*

**Page 3-9.** Table 3-3 has been modified as follows:

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**Table 3-3**

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Native and Non-Native Fish Species of the Columbia Slough	
Common Name	Native/Non-native
Prickly sculpin	Native (temperature tolerant)
Threespined stickleback	Native (temperature tolerant)
Northern pikeminnow	Native (temperature tolerant)
Peamouth	Native (temperature tolerant)
Largescale sucker	Native (temperature tolerant)
Crayfish	Native (temperature tolerant)

**Table 3-3**

**Native and Non-Native Fish Species of the Columbia Slough**

Common Name	Native/Non-native
Coho salmon	Native
Chinook salmon	Native
Chum salmon	Native
Steelhead trout	Native
Coastal cutthroat trout	Native
<del>Bull trout</del>	<del>Native</del>
<del>Green</del> White sturgeon	Native
Pacific lamprey	Native
Yellow perch	Non-native (temperature tolerant)
Bluegill	Non-native (temperature tolerant)
Pumpkinseed	Non-native (temperature tolerant)
Warmouth	Non-native (temperature tolerant)
White crappie	Non-native (temperature tolerant)
Black crappie	Non-native (temperature tolerant)
Brown bullhead	Non-native (temperature tolerant)
Yellow bullhead	Non-native (temperature tolerant)
Common carp	Non-native (temperature tolerant)
Goldfish	Non-native (temperature tolerant)
Largemouth bass	Non-native (temperature tolerant)
Banded killifish	Non-native (temperature tolerant)
Mosquitofish	Non-native (temperature tolerant)
Starry flounder	Non-native (temperature tolerant)
Asian freshwater shrimp	Non-native (temperature tolerant)

Sources: Fishman, 1988. City of Portland Bureau of Environmental Services, 2003.

**Page 3-11**, Fourth paragraph has a sentence added:

*More than 175 bird species have been documented in the complex of marshes, wetlands, forests and grasslands in the Lower Columbia Slough (CSWC, 2003). Several rare bird species have been observed within 5 miles of the project area. A large and important great blue heron rookery is located approximately 2 miles to the west. A bald eagle nest is located approximately 2.5 miles west and along the southeast corner of Smith Lake near North Portland Road.*

**Page 6-3**, First paragraph has been modified:

Upon selection of a preferred alternative, ODOT will ~~reapply~~ *refine* these actions during final design and the development of an engineered, site-specific wetland mitigation plan.

**Page 6-3.** The following two paragraphs and table have been added after Table 6-1:

*Mitigation for impacts to riparian areas will conform to requirements of the City of Portland Development Code. These rules define the number and types of planted trees and shrubs required to mitigate impacts to these areas in the Environmental Zone according to prescribed ratios and are summarized in the table below.*

**Table 6-1A. City of Portland Tree Replacement Criteria**

Size of Tree to be Removed (inches in diameter)	Option A (Number of trees to be planted)	Option B (Combination of trees and shrubs)
6 to 12	2	Not applicable
13 to 18	3	1 tree 3 shrubs
19 to 24	5	3 trees and 6 shrubs
25 to 30	7	5 trees and 9 shrubs
Over 30	10	7 trees and 12 shrubs

Note: Replacement trees must be at least 1-inch in diameter; shrubs must be in a 2-gallon container or equivalent in ball and burlap; conifers must be replaced with conifers; and shrubs must consist of at least two different species; all plants must be selected from the Portland Plant List.

*For areas outside of the environmental zone, ODOT will consult with the Urban Forester and comply with Chapter 20.42 Tree Cutting – permitting, removal, and mitigation requirements. Tree replacement is determined according to the diameter at breast height (dbh) of the tree removed. The total dbh of the replanted trees shall equal the dbh of the tree to be removed. Tree means any woody plant having at least a 12-inch dbh or any tree planted as a mitigation requirement of PCC 20.42.100.*

**Page 6-3 Conceptual Mitigation Plan,** paragraph 4 has been revised to read:

Based on the acreage of combined permanent wetland and riparian impacts, and the total combined wetland and riparian mitigation acreage available, the worst-case impact of 4.48 acres ~~would~~ *could* be effectively mitigated at a 1.5 to 1 replacement ratio within the combined wetland and riparian acreage available at the three mitigation sites.

**Page 6-4:** Overall Mitigation Goals has been modified as follows:

**Overall Mitigation Goals**

Overall mitigation goals are as follows:

- No net loss of wetland or riparian area
- Fully replace lost wetland functions and values
- Provide habitat for wildlife

- Support ~~Columbia Slough Watershed Plan and Action Plan~~ *Portland Watershed Management Plan (2005)* and *Columbia Slough Watershed Action Plan (2003)* goals

## Substantive Revisions

### Water Resources

Since the completion of the EA, dissolved copper has come to the forefront of highway runoff pollutants of concern. This Revised EA section addresses the concentration and load of dissolved copper from the project. Impacts are assessed based on the treatment assumed on pages 6-1 and 6-2 of the EA. The actual treatment provided when the project is constructed may vary, but will not be less than assumed in this analysis.

The project will reduce the concentration of dissolved copper in highway runoff by treating a substantial portion of the stormwater. However, it is unlikely that the mean concentration will drop below 4 to 6 µg/L, considered by NMFS to be the threshold of negative impacts on salmonids. The total load of dissolved copper will increase above existing conditions because of the amount of new impervious surface area.

Laboratory tests have shown that very low concentrations of dissolved copper can induce physiological changes in the olfactory organs of juvenile salmonids. Loss of sensitivity to odors can result in a reduction in the ability to avoid predators, find prey, and identify home waters, among other behaviors. In 1995, the mean dissolved copper concentration in highway runoff from I-5 was found to be 8 ug/L based on sampling for the NPDES Municipal Separated Storm Sewer permit. NMFS has considered a median concentration of 4 to 6 ug/L to be the threshold for adverse effects on salmon.

Before treatment, the total load of dissolved copper would increase above existing conditions by 17 to 30 percent with the construction of the project and the addition of impervious surface area. However, the project will reduce the concentration of dissolved copper in highway runoff by treating a substantial portion of the stormwater. The concentration of dissolved copper in untreated project runoff would not change from existing conditions. Because the existing concentration of dissolved copper is above the NMFS threshold for negative impact on salmonids, and because of limits on the capability of treatment to reduce dissolved copper concentrations, it is unlikely that the mean concentration will drop below the NMFS threshold. In addition, the sluggish flow of the Columbia Slough would slow down mixing, resulting in a lingering zone with copper concentrations closer to the discharged stormwater than the ambient Columbia Slough water. As a result of the treatment provided to the runoff, the concentration of dissolved copper in the poorly mixed zone would be lower than existing conditions, but because there would be more stormwater, the size of the zone would be larger.

### Wetlands

For the preparation of the EA, ODOT performed a wetland delineation for Schmeer Slough Wetland #3 in 2002. With the addition of Phase II of the project to include the access improvements associated with Alternatives 1 through 4, ODOT conducted a wetland determination for Denver Avenue Wetland #1, Victory Boulevard Wetland #2, Columbia Slough Wetland #4A, 4B, 4C, and Columbia Boulevard Wetland #5.

After the release of the EA, ODOT prepared a BA for submittal to NMFS. ODOT continued its analysis of wetland and riparian impacts and mitigation for the BA, and refined its analysis to ensure that mitigation of riparian areas conformed to the City of Portland Development Code in replacing mature trees removed by the project. As a result, the mitigation plan for the BA contains two mitigation sites not shown in the EA. In addition, some of the acreages calculated for wetland sites, impacts, and mitigation vary from those contained in the EA.

For the BA, ODOT agreed to prepare a worst-case impact analysis and mitigation plan for Alternative 4. Since completion of the BA, ODOT has selected Revised Alternative 2, which has fewer wetland impacts than Alternative 4. With the selection of Revised Alternative 2, the mitigation plan as prepared for the BA remains the current conceptual mitigation plan for the project and supersedes the conceptual mitigation plan contained in the EA. Where specific differences between the EA and the BA occur, ODOT provides a brief explanation in the sections that follow.

At the request of the Collaborative Environmental and Transportation Agreement for Streamlining (CETAS), ODOT provided additional information on the Cowardin and Hydrogeomorphic (HGM) classifications of wetlands impacted by the project, as shown in Table 4-1.

### Wetland Areas

Five potentially jurisdictional wetland areas were identified within the designated disturbance areas of the four Build alternatives (including Phase I, common to all alternatives). Each of these wetlands was subject to a determination-level field study, except for Schmeer Slough (#3), which was delineated. These areas are identified in Table 4-1 and Figure 3-1. Schmeer Slough (#3) and Columbia Slough (#4) are the only “wetland” areas (Waters of the State/U.S.) that contain a riparian zone. Additionally, Columbia Boulevard (#5) is a wetland located within the Columbia Slough’s riparian zone. An assumption was made that the riparian zone accounts for the buffer area (and mature tree impacts) above ordinary high-water elevation or aquatic (open-water) habitat. Wetlands #1 and #2 are not associated with riparian areas.

TABLE 4-1  
 Wetlands and Waters of the State/U.S. in the Project Area

Wetland ID	Wetland Location	Cowardin Class <sup>1</sup>	HGM Class <sup>2</sup>	Approximate Size	Riparian Area
Denver Avenue (#1)	North of Schmeer Road and immediately east of Denver Avenue	PSS	SLOPE	1.25 acre	None
Victory Boulevard (#2)	West of Victory Boulevard southbound on-ramp	PEM	SLOPE	3.55 acres	None
Schmeer Slough (#3)	North of Schmeer Road between I-5 and Whitaker Road	PUBHx, PEMC & PSSC	SLOPE-FLAT	5.13 acres	Yes
Columbia Slough (#4A, 4B, 4C)	Columbia Slough between Denver Avenue and I-5	R1UBV	RFT	5.2 acres	Yes

TABLE 4-1  
 Wetlands and Waters of the State/U.S. in the Project Area

Columbia Boulevard (#5)	Northwest of Columbia Boulevard southbound on-ramp and adjacent to the Columbia Slough	PSS/PEM	FLAT	1.77 acre	Yes
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Notes:

<sup>1</sup> PSS = *Palustrine scrub-shrub*, PEM = *Palustrine emergent*, PUBHx = *Palustrine unconsolidated bottom permanently flooded excavated*, PEMC = *Palustrine emergent seasonally flooded*, PSSC = *Palustrine scrub-shrub seasonally flooded*, R1UBV = *Riverine tidal, unconsolidated bottom, permanent-tidal*.

<sup>2</sup> HGM Class = Hydrogeomorphic Classifications, SLOPE = Slope, RFT = Riverine flow-through, FLAT = Flat.

**Wetland Impacts**

Phase I and Alternative 4 will both temporarily and permanently impact wetlands, Waters of the State/U.S., and riparian vegetation. Riparian vegetation is defined as those areas above aquatic (open-water) habitat for Schmeer Slough #3 and above ordinary high-water elevation on the south bank of Columbia Slough #4 and for Columbia Boulevard Wetland #5 (see Table 4-2). Improving wetland and riparian functions over a greater area in the long-term will mitigate for these impacts. Only a narrow fringe of riparian forest, which varies in width between approximately 50 and 200 feet, remains on the south bank of the Columbia Slough in the project area. Mitigation for impacts to riparian trees greater than 6 inches dbh will conform to City of Portland Bureau of Development Services code. The species composition of vegetation to be planted will reflect the native species present within the action area.

Table 4-2 shows the wetland impacts for Revised Alternative 2 and contains wetland impact calculations that have been refined since the release of the EA and BA.

TABLE 4-2

Phase I and Alternative 2 Temporary and Permanent Impacts to Wetlands and Waters of the State/U.S. and Riparian Corridor in the Project Area

Phase I Impacts	Wetland / Waters of the State /U.S. / Riparian ID (acres)										
	Denver Ave (#1) Wetland	Victory Blvd (#2) Wetland	Schmeer Slough (#3) Waters <sup>1</sup>	Schmeer Slough (#3) Wetland <sup>2</sup>	Columbia Slough (#4) Waters <sup>1,3</sup>	Columbia Slough Riparian <sup>2</sup>	Columbia Blvd (#5) Wetland <sup>2</sup>	Wetland/ Total (acres)	Waters of the State/US Total (acres)	Riparian Total (acres) <sup>2</sup>	City of Portland Riparian (acres) <sup>4</sup>
Temporary	0.01	0.77	—	1.58	0.116	1.34	0.06	2.42	0.116	1.34	3.08
Permanent	—	2.78	—	0.75	0.005	0.38	0.09	3.62	0.005	0.38	1.22
Subtotal =	0.01	3.55	0.0	2.33	0.121	1.72	0.15	6.04	0.121	1.72	4.3
<b>Phase II</b>											
Temporary	0.01	—	—	0.19	0.034	0.04	—	0.2	0.034	0.04	0.26
Permanent	0.02	—	—	—	0.006	—	—	0.02	0.006	—	—
Subtotal =	0.03	0.0	0.0	0.19	0.04	0.04	0.0	0.22	0.04	0.04	0.26
Phase I and Alt 2 Total =	0.04	3.55 <sup>5</sup>	0.0	2.52	0.17	1.76	0.15	6.26 <sup>6</sup>	0.17	1.76	4.56

Notes:

<sup>1</sup> Open-water habitat of Schmeer Slough (#3) and Columbia Slough (#4) is Waters of the State/U.S.

<sup>2</sup> Schmeer wetland (#3) and Columbia Boulevard wetland (#5) are jurisdictional wetlands located in the riparian zones of Schmeer Slough and Columbia Slough, respectively. Riparian impacts are above ordinary high-water elevation (18 feet National Geodetic Vertical Datum [NGVD]) for Columbia Slough and are not wetland impacts. Riparian mitigation that includes impacts to mature trees (greater than 6 inches dbh) will conform to requirements provided by the City of Portland Development Services.

<sup>3</sup> A Department of State Lands policy call has been made regarding wetlands below the ordinary high-water elevation, where it is not necessary to separate (or delineate) wetlands below this mark. Therefore, the wetlands along the slough that are below ordinary high-water are included in the Waters of the State/U.S. totals.

<sup>4</sup> Includes Schmeer wetland (#3) + Columbia Boulevard wetland (#5) + Columbia Slough riparian impacts.

<sup>5</sup> The total area of 1.89 acres shown for Victory Boulevard Wetland #2 was derived from field measurements. The impact of 3.55 acres was calculated in GIS using polygons defining the wetland area. The GIS wetland areas are larger than the field-measured area of Wetland #2. ODOT's calculation of impacts is therefore very conservative. Impacts are likely to be less. The final wetland mitigation plan will be based on a revised digital terrain model developed for the final design of the project.

<sup>6</sup> The temporary and permanent impacts calculated for the EA were based on preliminary information that was more accurately refined for the BA. As a result, this figure dropped from the 9.0 acres shown in the EA to the 6.43 (6.26+0.17) acres shown here. ODOT is being conservative in basing the 9.0 acres of mitigation shown in the EA on the preliminary acreage of impacts rather than the smaller impact acreage shown here.

## Wetland, Waters of the State and U.S, and Riparian Mitigation

The mitigation plan presented in the EA and then refined in the BA offsets impacts to wetland, Waters of the State/U.S., and riparian vegetation. The mitigation plan in the BA includes the mitigation proposed in the EA, but adds two areas not proposed at the time the EA was written. The Columbia Slough enhancement site on the south bank of the slough has been extended farther to the east and to the west than was proposed in the EA, and provides additional acreage. The Kenton Cove site was not included in the EA, but was added to the BA. The subsections below summarize mitigation opportunities adjacent to and near the project area. Table 4-3 summarizes mitigation for project impacts and Figure 3-1 depicts the proposed mitigation areas presented in the BA.

**Schmeer Slough Wetland Enhancement.** Goals for the Schmeer Slough site include constructing emergent wetland benches by dredging the channel and placing material along opposite sides of the waterway. The channel will be dredged in such a way as to create a meander. The purpose will be to improve water quality, create and restore wetlands, and restore *Palustrine emergent* and *Palustrine scrub-shrub* wetland habitat along this remnant of the Columbia Slough. Potential exists for restoring approximately 2.5 acres of wetland and enhancing approximately 2.5 acres of Waters of the State/U.S. habitat, for a combined total of 5.0 acres of wetland mitigation at this location.

**G.I. Joe Drainageway.** The “G.I. Joe Drainageway” was assessed in April 2003 and is a *Palustrine emergent* wetland. The G.I. Joe Drainageway consists of a narrow waterway on the north side of Portland Meadows racetrack and the old Portland Speedway track. A smaller ditch located on the east side of Portland Meadows is connected to the waterway by a culvert. Removal of the culvert will improve hydraulic connectivity and water quality by reducing residence time in this area. The drainageway is dominated by non-native, invasive species including reed canary grass and Himalayan blackberry. The slopes are steep and lack structure and plant diversity. The drainageway is relatively straight and shallow and water flow is sluggish. Goals for this site include restoring hydraulic connectivity between two historical drainageway segments by removing an existing culvert and replacing the culvert with a small swale. Potential exists for approximately 1.66 acres of wetland restoration and 2.25 acres of riparian enhancement for a total of 3.91 acres of mitigation at this location.

**Columbia Slough Enhancement.** Goals for restoring and enhancing the Columbia Slough area include removing non-native and invasive species along the shoreline and revegetating these areas with a diverse mix of native wetland and upland species; constructing *Palustrine emergent* and *Palustrine scrub-shrub* wetland benches on the south bank of the channel and anchoring LWD along the south bank (outside of the hydraulic channel); and creating bat roosting habitat underneath new bridge crossings of the Columbia Slough for partial compensation for riparian impacts. Mitigation for the loss of functional riparian vegetation will be accomplished by removing non-native blackberry and other noxious weeds along the banks and planting trees that will provide future LWD and other riparian functions. Potential exists for enhancing approximately 0.5 acre of Waters of the State/U.S. and restoring approximately 3.65 acres of riparian habitat, for a total of 4.15 acres of mitigation at this location.

**Kenton Cove.** Kenton Cove is a small backwater area west of the existing Denver Avenue Bridge crossing of the Columbia Slough. Kenton Cove was identified by the City of Portland as a project to include in the WRDA Willamette Restoration Projects. The objectives and anticipated benefits of the proposed enhancement action include providing in-stream complexity through dredging a central area in the cove and placing anchored rootwads. The City of Portland and volunteers revegetated approximately 2.0 acres of the existing off-channel habitat area from 1998 to 2003. There may be additional opportunities to plant native vegetation. By dredging a central channel and adding large wood, this action would increase value of the off-channel habitat for salmonids, native fish, amphibians, birds, and other wildlife. The enhancement will be used to address permanent impacts of the project to the Columbia Slough and compensatory mitigation for permanent wetland impacts. Potential exists for enhancing approximately 2.85 acres of Waters of the State/U.S. habitat and 1.0 acres of riparian habitat for a total of 3.85 acres of mitigation at this location.

### Mitigation Site Summary

A total of approximately 17 acres in the form of wetland restoration and enhancement will be provided at Schmeer Slough, G.I. Joe Drainageway, Columbia Slough, and Kenton Cove. The majority of impacts are to *Palustrine emergent* and *Palustrine scrub-shrub* wetlands, with less than 0.17 acre of impacts to riverine habitat (Waters of the State/U.S.). A total of 1.72 acres of riparian restoration for Phase I and 0.22 acre for Alternative 2 will mitigate for impacts to riparian areas above ordinary high water along the slough.

Because only one of the five wetlands/Waters of the State/U.S. was delineated (Schmeer Slough) before the preparation of the EA and BA, temporary and permanent impact assumptions were made to accommodate the resource impacts. During final design, all additional project-related wetland and water resources will be delineated to obtain verifiable temporary and permanent impact acreages.

TABLE 4-3  
 Phases I and II Total Riparian and Wetland Impacts and Mitigation

Phase I				
Impacts	Riparian (acres)	Wetland/ Waters of the State/U.S. (acres)	Mitigation	
			Riparian <sup>1</sup>	Wetland / Waters (acres) <sup>2</sup>
Temporary	1.34	2.54	1.34	Restoration = 3.4
Permanent	0.38	3.63	0.38	Enhancement = 10.5
Phase I Total =	1.72	6.17	1.72	13.9
Temporary	0.04	0.23	0.21	Restoration = 1.6
Permanent	0.00	0.03	0.01	Enhancement = 1.5
Phase II Total =	0.04	0.26	0.22	3.1

TABLE 4-3  
 Phases I and II Total Riparian and Wetland Impacts and Mitigation

Phases I and II Total =	1.76	6.43	1.94 1	17.0
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Notes:

<sup>1</sup> Mitigation for impacts to mature trees will conform to requirements provided by the City of Portland Development Services. No “acreage” requirements are prescribed for riparian mitigation.

<sup>2</sup> Wetland mitigation ratios are based on Oregon Division of State Lands criteria (1:1 restoration and 3:1 enhancement). OAR 141-085-0010 definitions are as follows: "Restoration" means to reestablish wetland hydrology to a former wetland sufficient to support wetland characteristics. "Enhancement" refers to a human activity that increases the function of an existing degraded wetland.

## Air Quality

### Portland Air Toxics Assessment

Air quality concerns raised by the Cascade Resources Advocacy Group (CRAG) during the public comment period were complex and as such warrant the discussion provided below. The reader is referred, as well, to ODOT’s response to the CRAG comment letter. The letter and response are located in the Section 6 subsection titled Specific Responses to Public and Agency Comments on the EA.

DEQ’s Portland Air Toxics Assessment (PATA) (1999) is a comprehensive analysis of air toxic impacts from transportation and industrial sources in the Portland area. The air toxic concentrations were determined through use of the CALPUFF model, a highly advanced dispersion model capable of estimating concentrations from the complex sources found in an industrialized urban area. The PATA study shows the relationship of mobile emissions to relative concentrations of diesel particulate and benzene adjacent to the freeway in the study area.

DEQ modeled mobile sources for the PATA study using emissions information from Metro. To minimize the volume of data generated, DEQ defined emissions by Traffic Analysis Zones (TAZs). TAZ data also were provided by Metro. Through use of the TAZ data, the isopleths generated by the PATA study do demonstrate the dispersion of air toxics, including those generated by the I-5 freeway.

The TAZs are roughly analogous to census tract centroids. (Figure 3-16 of the EA shows the TAZs in the project area.) Receptor sites were in fact the centroids of census blocks. In both cases, the more densely populated an area, the smaller the source area and the denser the receptor grid. In the project area, where most of the citizen concerns are centered, the TAZ zones are geographically small areas. The transportation emissions were modeled on these geographically small areas, and were modeled in CALPUFF as area sources. Because the areas are small, roadway sources on and near the freeway are well-represented. CALPUFF is a dispersion model, and these transportation sources were dispersed as part of the modeling.

As shown in Figure 3-26 of the EA, the PATA study indicates that the largest diesel particulate impact area is located near the Pearl District. This impact area is generally considered to result from the amount of construction ongoing during the study period (DEQ, 1999). DEQ provides a closer view of the project area in Figure 4-1, showing the same

isopleths as in Figure 3-26 of the EA. Figure 4-1 shows the impacts near I-5 in the study area. The roadway sources near the freeway are well represented in the model because the TAZs are geographically small areas, and the CALPUFF model has dispersed the contribution from each TAZ along with other air toxics. The highest impacts of pollutants such as diesel particulates occur near the freeway. Figure 4-1 also shows that the highest concentrations of diesel occur south of the project area near the Pearl District.

### Conformity Determination

The conformity determination stated in the environmental assessment is unchanged. The Preferred Alternative, Revised Alternative 2, is consistent with the project description in the 2004 RTP and in the 2006 – 2009 STIP.

### Environmental Justice

ODOT has prepared this supplemental section on environmental justice in response to comments received on environmental justice. One comment on the EA requested that ODOT provide additional information on the demographics of the communities near the project in relation to the Portland metropolitan area in order to be able to determine whether the area included higher proportions of minority or low-income populations. In response to this comment, an analysis was developed for the Revised EA and is documented in this section. This additional environmental justice analysis does not change the fundamental conclusion documented in the EA: the project does not result in environmental justice impacts. The project does not significantly impact environmental justice, air quality, or result in significant loss of jobs in the Environmental Justice Study Area.

Different study areas were developed for each area of analysis because the impacts for each subject of analysis differ. The composite of individual discipline study areas makes up the Environmental Justice Study Area (Figures 3-33 through 3-36).

The EA provides demographic statistics on the Social Study Area on pages 3-33 and 3-34 of the Social portion of Section 3, Affected Environment. Figure 3-15 of the EA shows the Social Study Area. Statistics are categorized and analyzed for population, housing, and racial characteristics; age characteristics; income and poverty characteristics; and presence of disability. However, the EA only provided income and racial or minority demographic statistics for the Environmental Justice Study Area in the EA.

One comment on the EA requested that ODOT provide additional information on the demographics of the communities near the project in relation to the Portland metropolitan area in order to be able to determine whether the area included higher proportions of minority or low-income populations. In response to this comment, an analysis was developed for the Revised EA and is documented in this section. This analysis compares the demographic data for the Social Study Area, the Environmental Justice Study Area, the City of Portland, the Portland metropolitan area, and the state of Oregon.

In addition, this new analysis reports equivalent demographic data for both the Social Study Area and the Environmental Justice Study Area. The analysis compares the demographic data for the Social Study Area, the Environmental Justice Study Area, the City of Portland, the Portland metropolitan area, and the state of Oregon.

Nine additional maps have been developed for the Revised EA to show minority and low-income data for the Environmental Justice Study Area (see Figures 4-2 through 4-10). These maps supplement EA Figures 3-33 through 3-35. Minority, very low-income, and low-income populations for the Environmental Justice Study Area are represented. The additional maps display the same minority, very low-income, and low-income data at three different geographic scales. The three geographic scales represent the Environmental Justice Study Area, a portion of the Portland Standard Metropolitan Statistical Area (SMSA), and the entire SMSA. The figures at the same scale as those in the EA also display minority, very low-income, and low-income data for all block groups instead of only for the Environmental Justice Study Area, as was the case in the EA. Including minority and low-income data outside the Environmental Justice Study Area provides a larger frame of reference for the location of environmental justice populations in the Environmental Justice Study Area in relation to the environmental justice populations in surrounding areas. In summary, the minority, very low-income, and low-income figures are shown in the same order as in the EA, but each subject is grouped with the two additional geographic scales for that demographic subject.

### Study Area Demographics

This section provides demographic information on the Social and Environmental Justice study areas. See Figures 4-2 through 4-10 for maps of minority and low-income data for the Environmental Justice Study Area and the Portland metropolitan area.

The boundaries of the Social Study Area and the Environmental Justice Study Area remain unchanged from those documented in the social section of the EA. All Social Study Area data are from the 2000 U.S. Census (U.S. Bureau of the Census, 2004). Tables 3-2 through 3-6 in the *I-5: Delta Park (Victory Boulevard to Lombard Section) Social Technical Report* contain the detailed census data statistics that support the statements in the following discussion of Social Study Area demographics. Additional data have been gathered for the Environmental Justice Study Area to provide equivalent demographic analysis for both study areas.

**Population, Housing, and Racial Characteristics.** No figures are provided for population or housing characteristics. The 2000 U.S. Census reported 9,906 residents in the Social Study Area, composing roughly 4,000 households, with an average size of 2.45 persons. For the Environmental Justice Study Area, the 2000 U.S. Census reported 63,270 residents, composing roughly 25,650 households, with an average size of 2.37 persons. The population is composed of 49 percent males and 51 percent females in the Social Study Area, and 50 percent males and 50 percent females in the Environmental Justice Study Area. There are approximately 4,250 housing units in the Social Study Area, with a vacancy rate of 6 percent. Of the occupied housing units in the Social Study Area, 64 percent are owner occupied, and 36 percent are renter occupied. The majority of homes were built during the World War II era, between 1939 and 1945. In the Environmental Justice Study Area, there are approximately 27,825 housing units with a vacancy rate of 8 percent. Of the occupied housing units, 51 percent are owner occupied and 49 percent are renter occupied. The majority of homes in the Social and Environmental Justice study areas were built during the World War II era, between 1939 and 1945.

Figures 4-2 through 4-4 depict the percent minority population by census block group. As reported in the 2000 U.S. Census, 5,989 persons in the Social Study Area classified

themselves as White (approximately 60 percent), and 40,091 persons in the Environmental Justice Study Area classified themselves as White (approximately 63 percent). For both study areas, these numbers reflect greater diversity than the state average of 87 percent White, or the City of Portland average of 78 percent White. Another 19 percent of the Social Study Area and the Environmental Justice Study Area classified themselves as Black, African American, or Negro (1,868 and 11,895 persons, respectively). Five percent of the Social Study Area and 4 percent of the Environmental Justice Study Area classified themselves as Asian (515 and 2,648 persons, respectively). Eight percent of the Social Study Area and 11 percent of the Environmental Justice Study Area considered themselves Spanish, Hispanic, or Latino (827 and 6,852 persons, respectively).

**Age Characteristics.** No figures are provided for age characteristics. The percentage of elderly people in the total population of each block group in the Social Study Area varies between 8 and 16 percent, with a Social Study Area proportion of 11 percent recorded as 65 or older. In the Environmental Justice Study Area, the percentage of elderly people varies between 1 and 69 percent, with an Environmental Justice Study Area proportion of 10 percent recorded as 65 or older. These proportions are comparable to the proportion of elderly persons in Multnomah County (11 percent) and the City of Portland (12 percent).

Median age in the Social Study Area was 35 in 2000. Median age varied by block group, from 31 at the eastern edge of Piedmont to 41 north of the Columbia Slough. Median age in the Environmental Justice Study Area was 34 in 2000. Median age varied by block group from 26 years of age for a block group in the St. Johns neighborhood in North Portland to 70 immediately north of the Columbia River and west of I-5 in Clark County.

Approximately 2,000 households (approximately 50 percent) in the Social Study Area reported the presence of children less than 18 years of age. In the Environmental Justice Study Area, approximately 7,150 (approximately 28 percent) reported the presence of children less than 18 years of age.

**Income and Poverty Characteristics.** Figures 4-5 through 4-10 depict income status by census block group. Median household income ranges from \$31,379 to \$49,256 within the census blocks in the Social Study Area, and from \$6,985 to \$56,875 in the Environmental Justice Study Area. The average of the median household incomes was \$37,723 in 1999 in the Social Study Area, and \$33,243 in the Environmental Justice Study Area. These median household incomes are lower than the median household income, for the state of Oregon (\$40,916), Multnomah County (\$41,278), the City of Portland (\$40,146), or the SMSA (\$48,464).

Poverty in this analysis is defined as the percentage of the population living in a household with an income below the federal poverty level as reported by the 2000 Census. Poverty in both the Social and Environmental Justice study areas is higher than in the state, county, and city. The percent below the poverty level is 14 percent for the Social Study Area and 19 percent for the Environmental Justice Study Area, compared with 12 percent for the state of Oregon, 13 percent for Multnomah County, and 13 percent for the City of Portland.

In both study areas, a range of poverty was identified. In the Social Study Area, census tract 37.01, block group 4 had the highest percentage of residents in poverty in 1999 – a total of 29 percent. This block group is located east of I-5, between Albina and Vancouver Avenues, bounded by Columbia Boulevard to the north and Holland Street to the south. On the other

hand, census tract 38.02, block group 3 had the lowest percentage of residents in poverty in 1999—7 percent. This is the area west of I-5, bounded by Lombard Street to the north, Portland Boulevard to the south, Denver Avenue to the east, and Delaware Avenue to the west.

In the Environmental Justice Study Area, census tract 424, block group 1 had the highest percentage of residents in poverty in 1999—a total of 64 percent. This block group is located west of I-5 in downtown Vancouver, between Main Street and Franklin Street, bounded by 13th Street to the north and 8th Street to the south. On the other hand, census tract 35.02, block group 3 had the lowest percentage of residents in poverty in 1999—1 percent. This block group is west of I-5, bounded by Skidmore Street to the north, Shaver Street to the south, Interstate Avenue to the east, and Overlook Boulevard to the west.

**Presence of Disability.** No figures are provided for the presence of disability. In total, 3,789 persons in the Social Study Area listed a presence of some form of disability—38 percent of the study area population. In the Environmental Justice Study Area, 27,477 persons listed the presence of some form of disability—43 percent of the study area population. These percentages are higher than the 28 to 33 percent range of disabled persons in the state of Oregon, Multnomah County, the City of Portland, and the SMSA.

**Household Vehicles.** No figures are provided for household vehicles. Fifteen percent of households in the Social Study Area and 18 percent in the Environmental Justice Study Area reported zero vehicles (a proxy for transit-dependent households).

### Demographic Summary

Table 4-4 summarizes the demographic data for the Social and Environmental Justice study areas. City of Portland, Portland SMSA, and state of Oregon demographic data are provided in Table 4-4 for comparison with the two study areas.

TABLE 4-4  
 Demographic Summary by Geographic Area, 2000

Demographic Criteria	Social Study Area	Environmental Justice Study Area	City of Portland	Portland SMSA	State of Oregon
Number of Residents	9,906	63,270	538,544	1,789,457	3,421,399
Number of Households	4,000	25,650	223,737	696,669	1,333,723
Average Household Size	2.45	2.37	2.30	2.57	2.51
Percent Male and Female	49%, 51%	50%, 50%	49%, 51%	50%, 50%	50%, 50%
Number of Housing Units	4,250	27,825	237,307	738,458	1,495,582
Percent of Housing Units Vacant	6%	8%	6%	6%	8%

TABLE 4-4  
 Demographic Summary by Geographic Area, 2000

<b>Demographic Criteria</b>	<b>Social Study Area</b>	<b>Environmental Justice Study Area</b>	<b>City of Portland</b>	<b>Portland SMSA</b>	<b>State of Oregon</b>
Percent Owner Occupied	64%	51%	56%	62%	64%
Percent White	60%	63%	78%	84%	87%
Percent Black, African American, or Negro	19%	19%	7%	3%	2%
Percent Asian	5%	4%	6%	5%	3%
Percent Spanish, Hispanic, or Latino	8%	11%	7%	7%	8%
Percent Elderly	11%	10%	12%	10%	13%
Median Age	35	34	35	35	36
Percent Households with Children	50%	28%	27%	33%	33%
Median Household Income	\$37,723	\$33,243	\$40,146	\$48,464	\$40,916
Average Poverty Level	14%	19%	13%	9%	12%
Percent Disabled	38%	43%	35%	30%	34%
Percent of Households with Zero Vehicles	15%	18%	14%	8%	7%

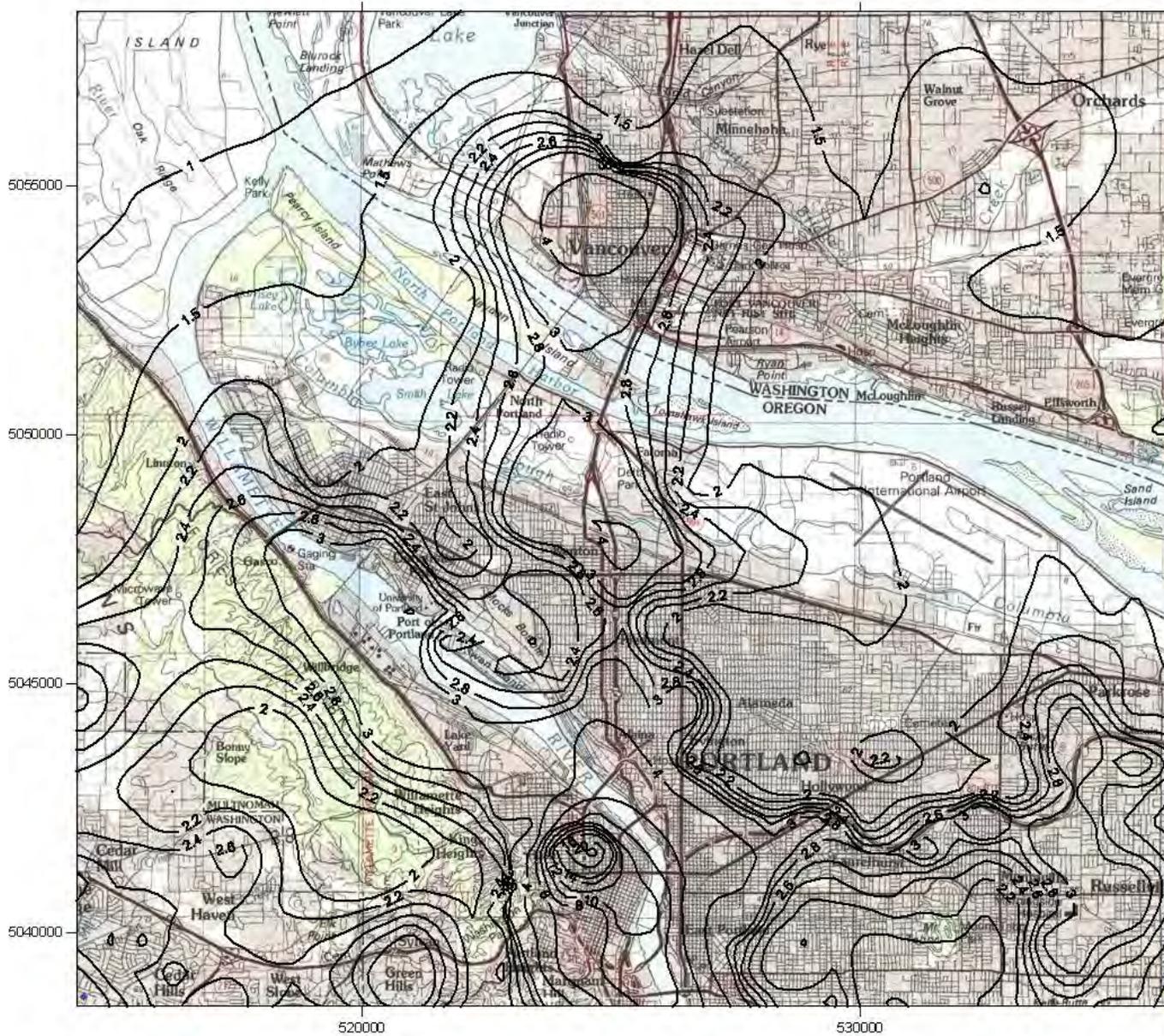
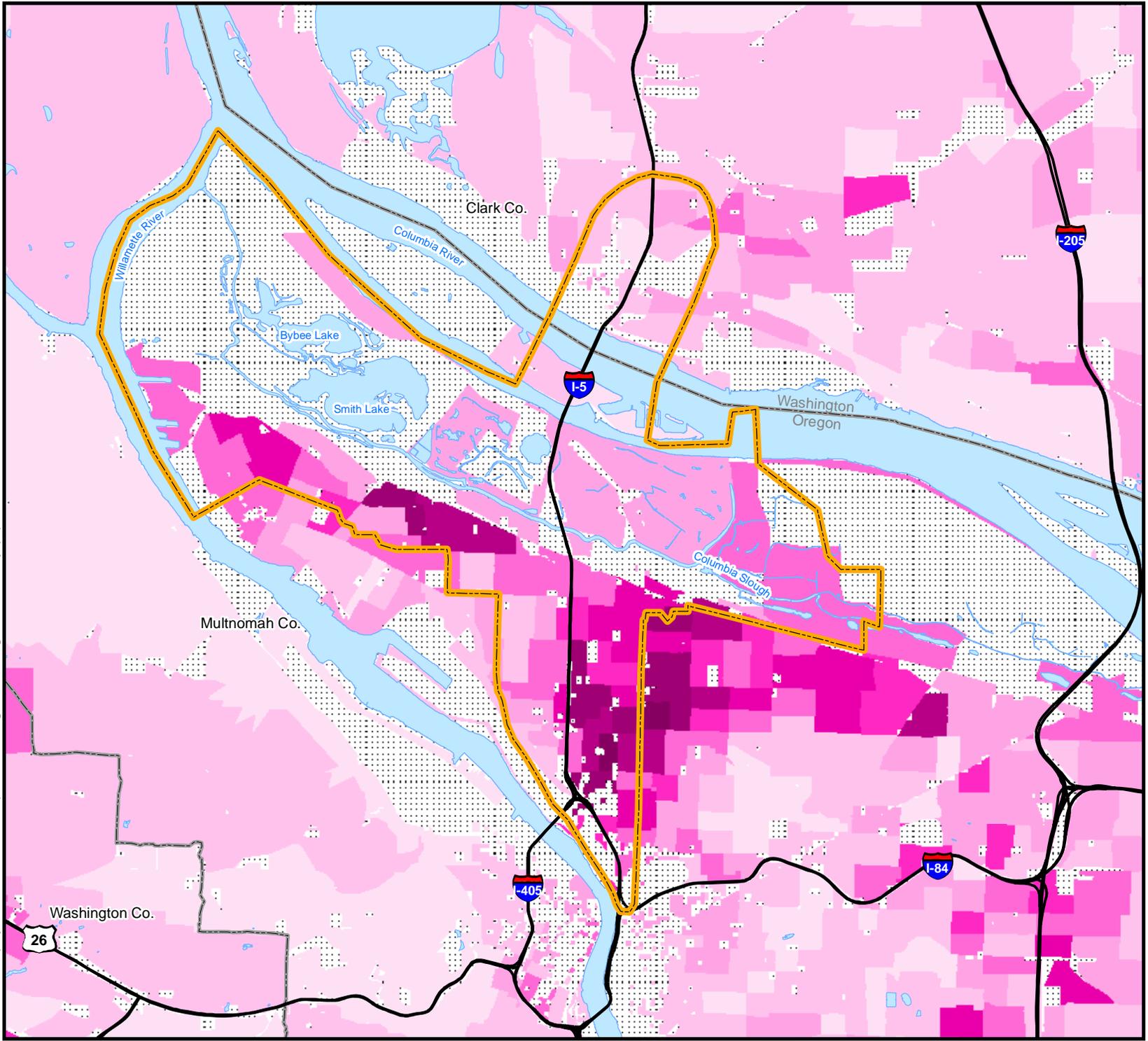


FIGURE 4-1  
**PATA 1999: Diesel PM Modeled Concentrations ( $\mu\text{g}/\text{m}^3$ )**

**REVISED ENVIRONMENTAL ASSESSMENT**  
 I-5: DELTA PARK (VICTORY BOULEVARD TO LOMBARD SECTION)

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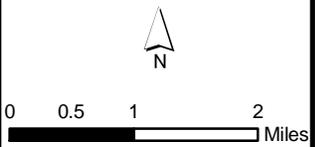
**I-5: Delta Park  
(Victory Boulevard to  
Lombard Section)**

Multnomah County,  
Oregon



- Legend**
- Study Area Boundary
  - Highways
  - Counties
  - Rivers and Streams
- Percent Minority Population  
(By Census Block Group)**
- 0% - 10%
  - 10% - 20%
  - 20% - 30%
  - 30% - 40%
  - 40% - 50%
  - 50% - 60%
  - 60% - 70%
  - 70% - 80%
  - 80% - 90%

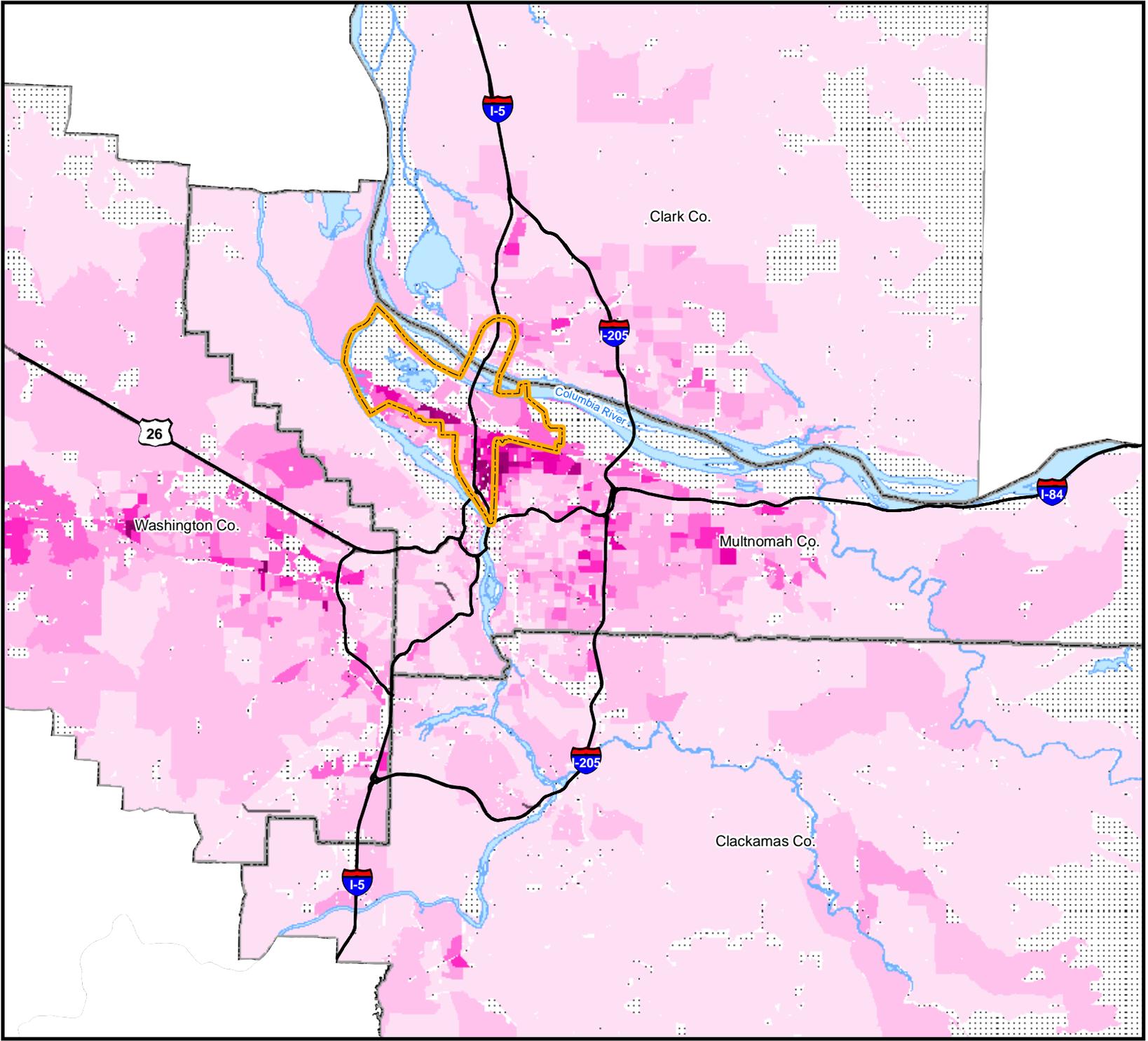
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Source: Metro 2004; US Census Bureau, 2000



**Figure 4-2**  
Environmental Justice Study Area  
Minority Population

Figure4-2\_Minority\_population\_EJSA.pdf

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**I-5: Delta Park  
(Victory Boulevard to Lombard Section)**

Multnomah County,  
Oregon



**Legend**

- Study Area Boundary
  - Highways
  - Counties
  - Rivers and Streams
- Percent Minority Population  
(By Census Block Group)
- 0% - 10%
  - 10% - 20%
  - 20% - 30%
  - 30% - 40%
  - 40% - 50%
  - 50% - 60%
  - 60% - 70%
  - 70% - 80%
  - 80% - 90%

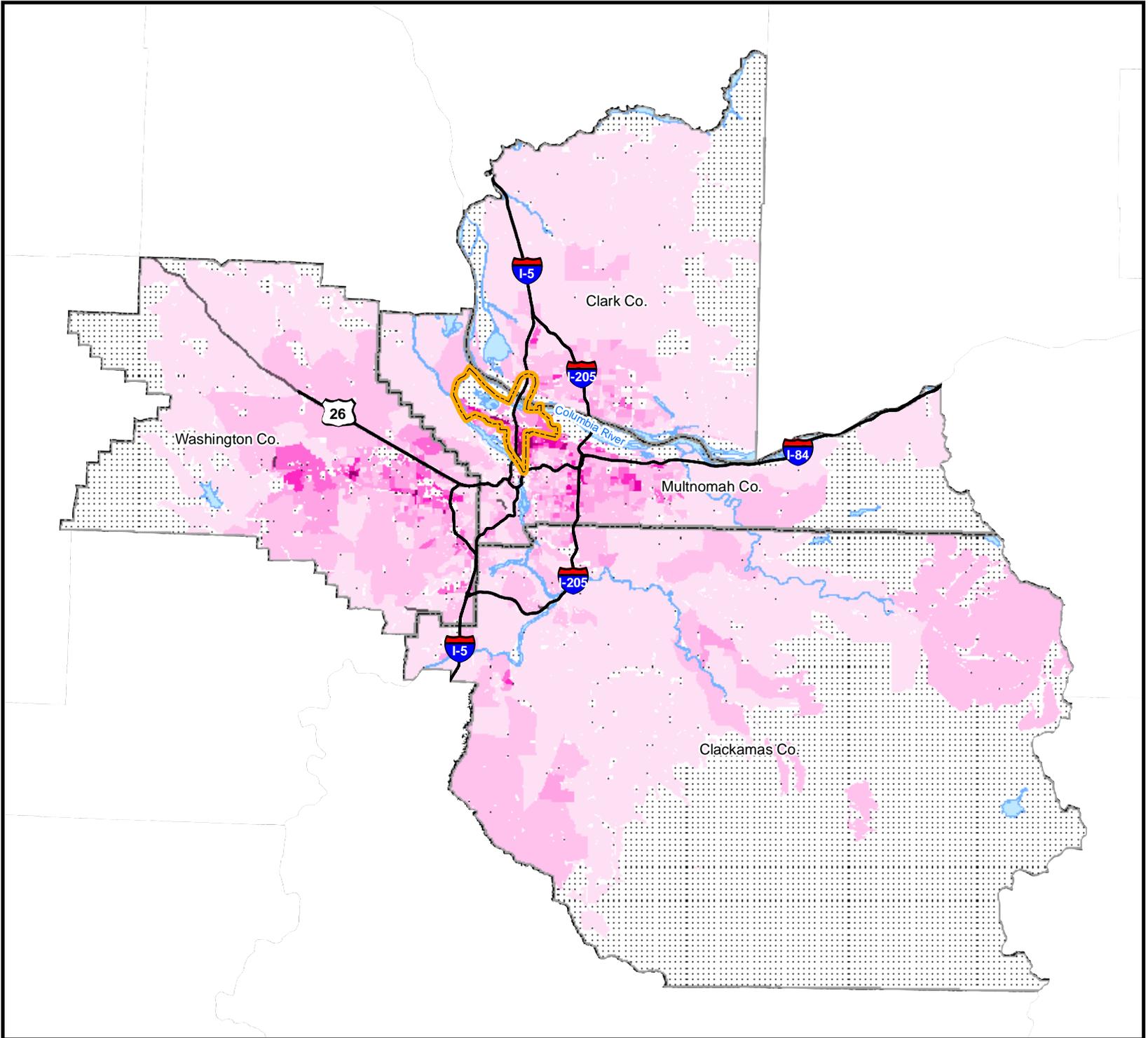
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Source: Metro 2004; US Census Bureau, 2000



**Figure 4-3**

Portion of Portland SMSA  
Minority Population

Figure4-3\_Minority\_population\_PortionofSMSA.pdf



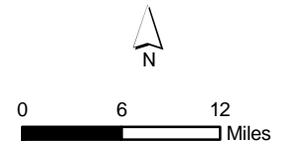
**I-5: Delta Park  
(Victory Boulevard to  
Lombard Section)**  
Multnomah County,  
Oregon



**Legend**

- Study Area Boundary
- Highways
- Counties
- Rivers and Streams
- Percent Minority Population  
(By Census Block Group)**
- 0% - 10%
- 10% - 20%
- 20% - 30%
- 30% - 40%
- 40% - 50%
- 50% - 60%
- 60% - 70%
- 70% - 80%
- 80% - 90%
- Population = 0

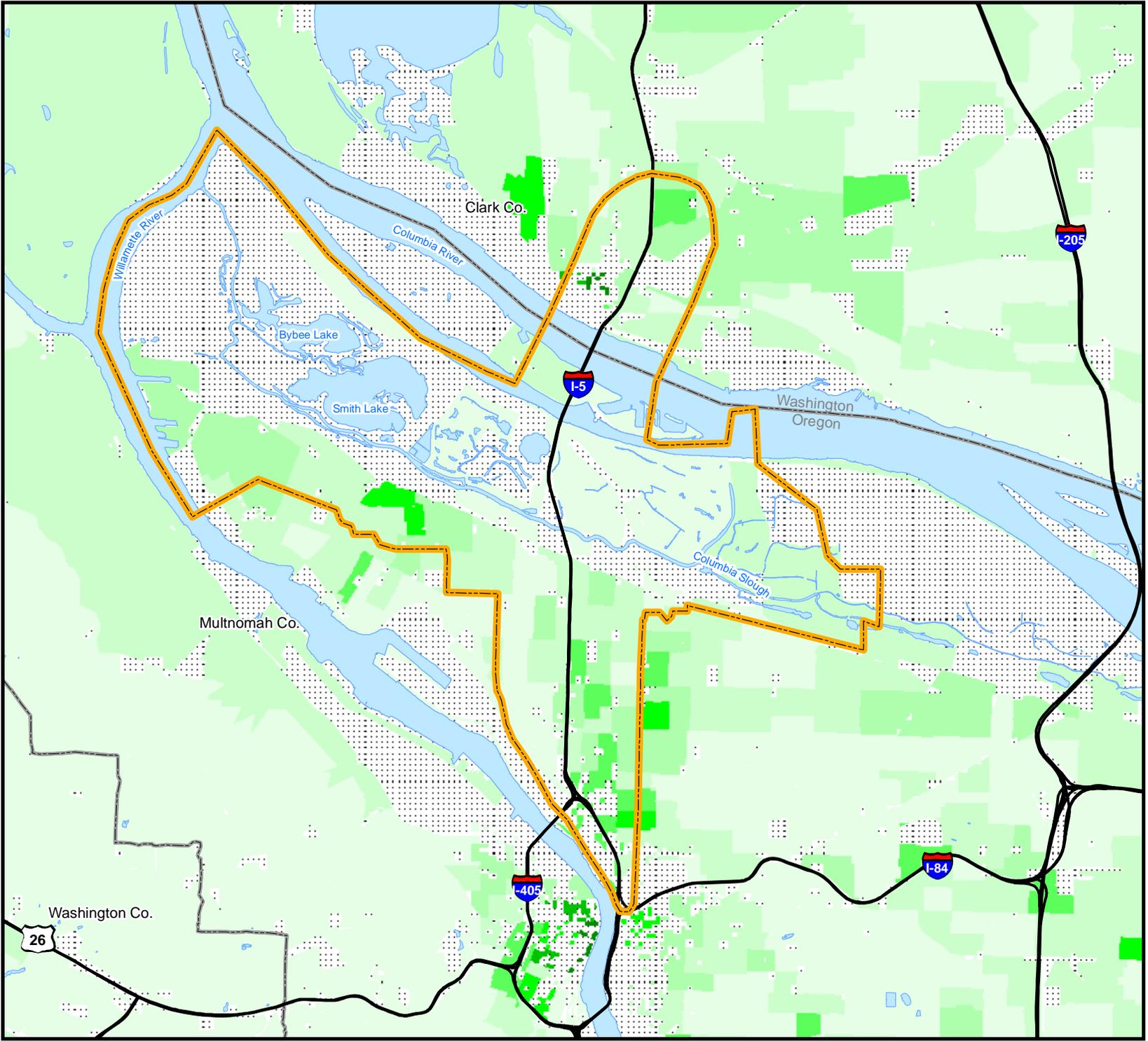
Source: Metro 2004; US Census Bureau, 2000



**Figure 4-4**

Portland SMSA  
Minority Population

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**I-5: Delta Park  
(Victory Boulevard to Lombard Section)**

Multnomah County,  
Oregon



**Legend**

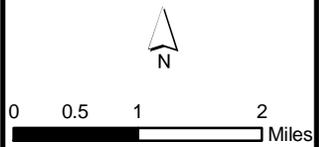
- Study Area Boundary
- Highways
- Counties
- Rivers and Streams

Percent Below the Poverty Line (By Census Block Group)

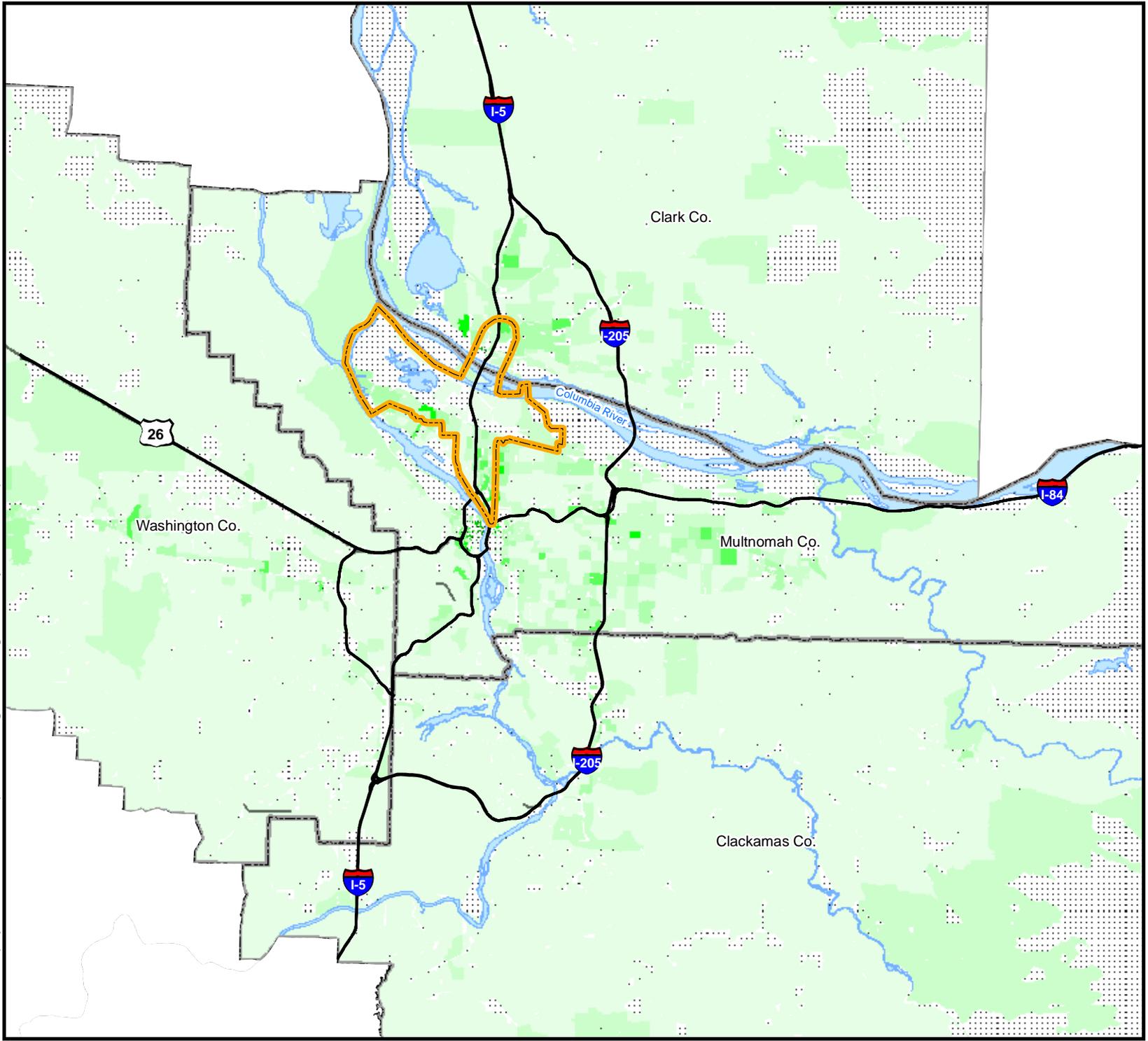
- 0% - 10%
- 10% - 20%
- 20% - 30%
- 30% - 40%
- 40% - 50%
- 50% - 60%
- 60% - 70%
- 70% - 80%
- 80% - 90%

Population = 0

Source: Metro 2004; US Census Bureau, 2000



**Figure 4-5**  
Environmental Justice Study Area  
Very Low-Income Population-  
Below the Poverty Line



**I-5: Delta Park  
(Victory Boulevard to Lombard Section)**

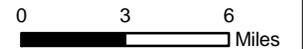
Multnomah County,  
Oregon



**Legend**

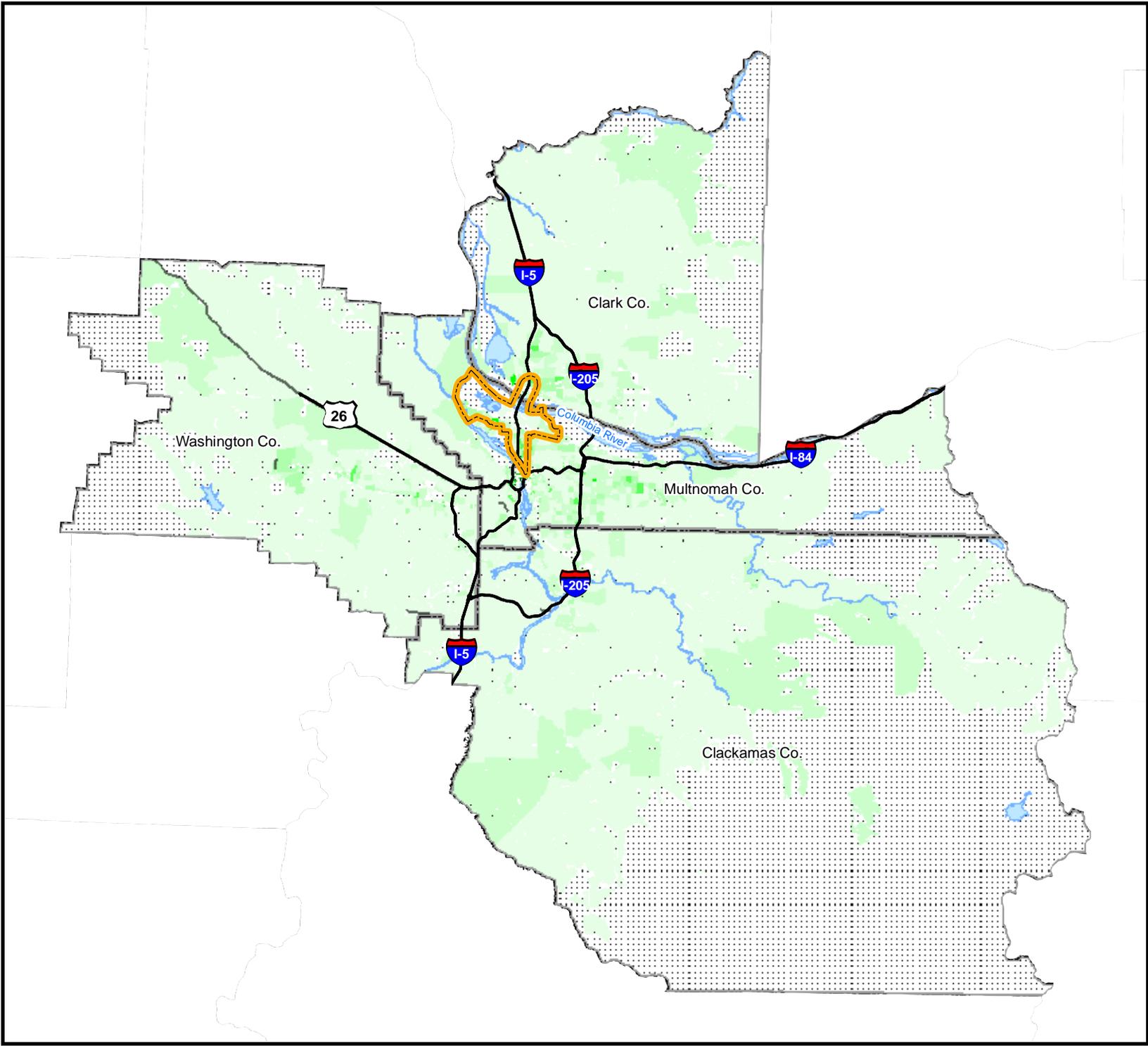
- Study Area Boundary
- Highways
- Counties
- Rivers and Streams
- Percent Below the Poverty Line (By Census Block Group)
  - 0% - 10%
  - 10% - 20%
  - 20% - 30%
  - 30% - 40%
  - 40% - 50%
  - 50% - 60%
  - 60% - 70%
  - 70% - 80%
  - 80% - 90%
- Population = 0

Source: Metro 2004; US Census Bureau, 2000



**Figure 4-6**

Portion of Portland SMSA  
Very Low-Income Population-  
Below the Poverty Line



**I-5: Delta Park  
(Victory Boulevard to  
Lombard Section)**

Multnomah County,  
Oregon



**Legend**

- Study Area Boundary
- Highways
- Counties
- Rivers and Streams

Percent Below the Poverty  
Line (By Census Block Group)

- 0% - 10%
- 10% - 20%
- 20% - 30%
- 30% - 40%
- 40% - 50%
- 50% - 60%
- 60% - 70%
- 70% - 80%
- 80% - 90%

Population = 0

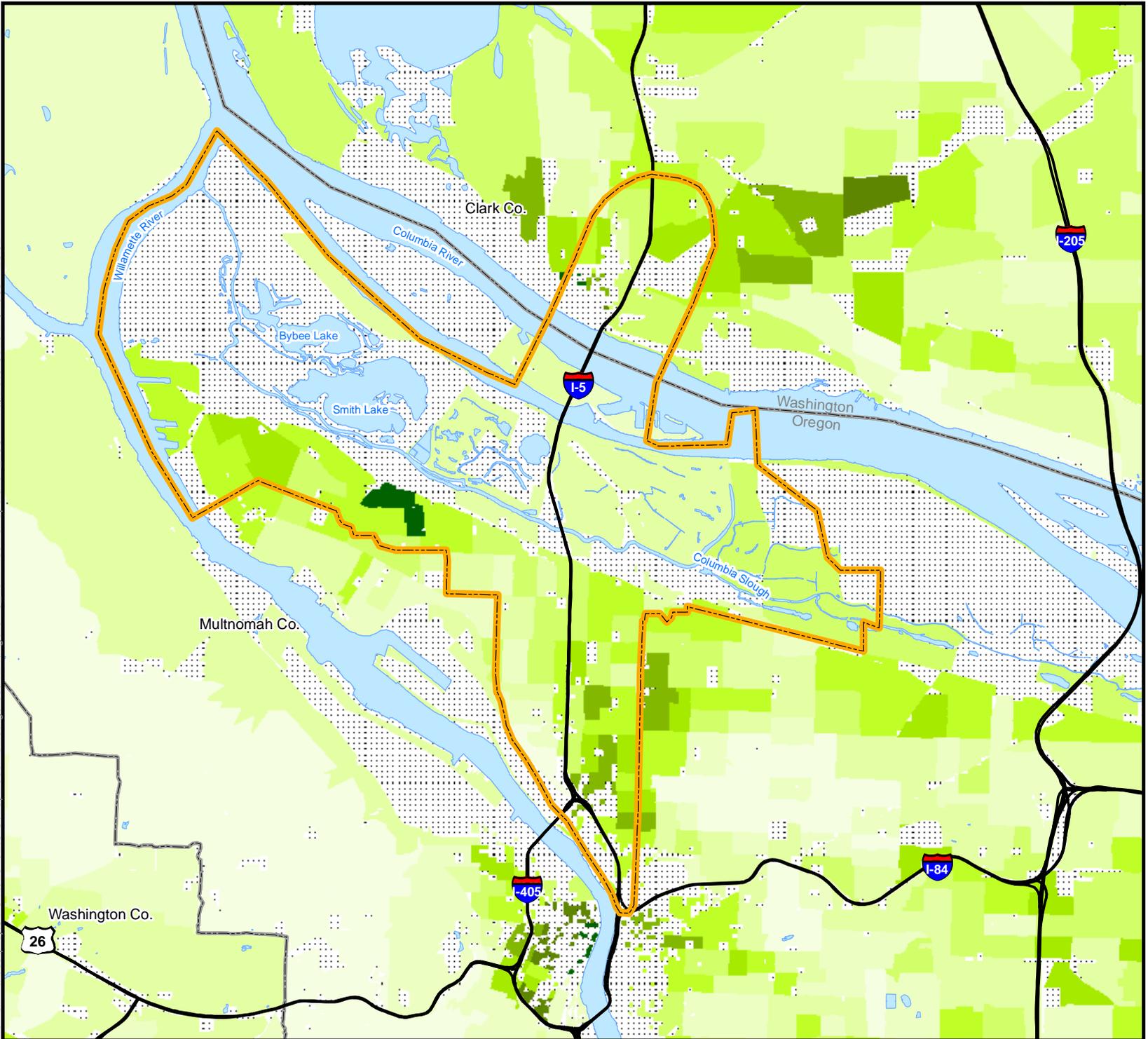
Source: Metro 2004; US Census Bureau, 2000



0 6 12  
Miles

**Figure 4-7**  
Portland SMSA  
Very Low-Income Population-  
Below the Poverty Line

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**I-5: Delta Park  
(Victory Boulevard to  
Lombard Section)**

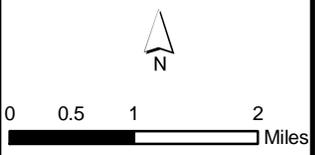
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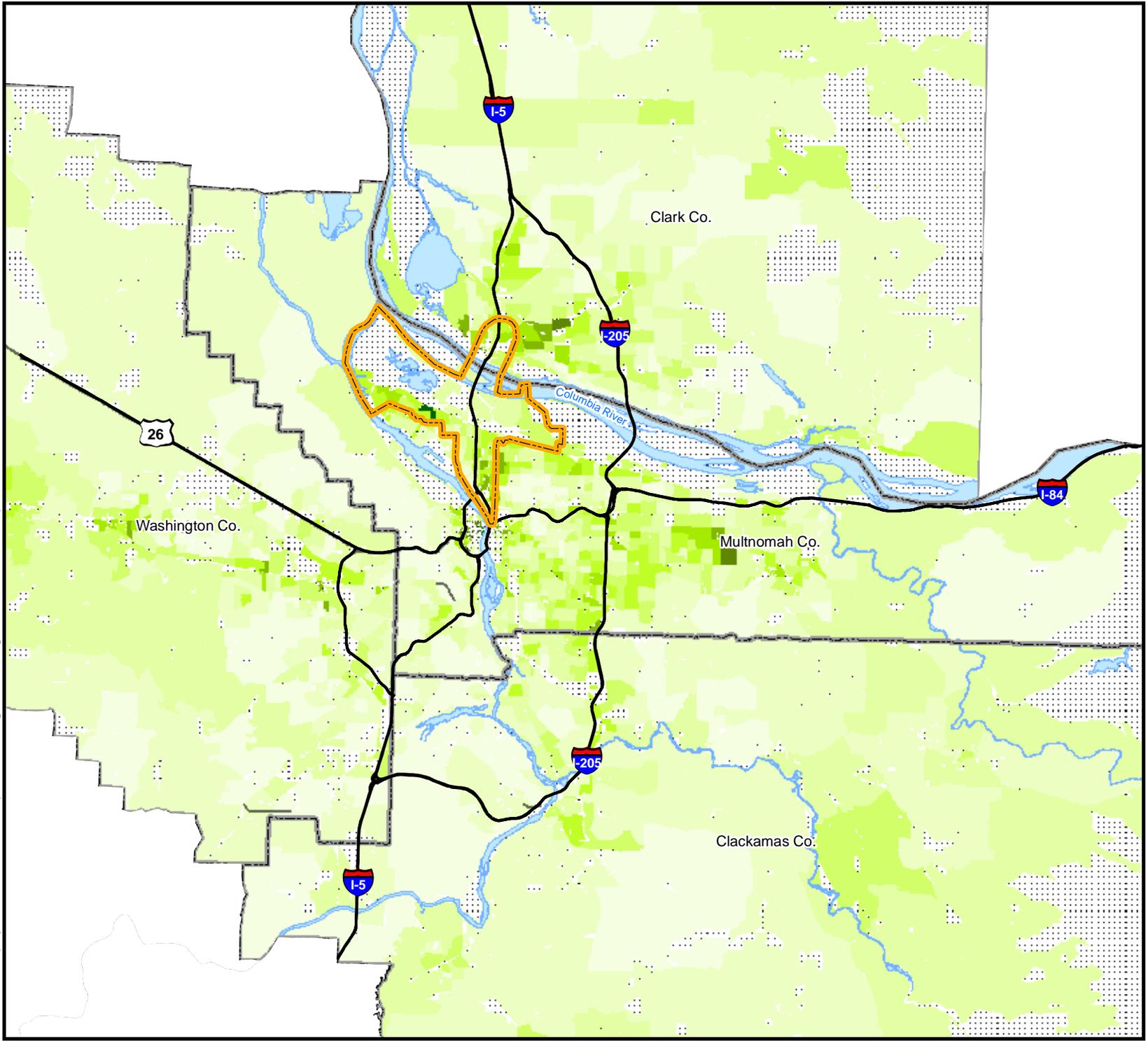
**Legend**

- Study Area Boundary
  - Highways
  - Counties
  - Rivers and Streams
- Percent Below 2x the Poverty Line (By Census Block Group)
- 0% - 10%
  - 10% - 20%
  - 20% - 30%
  - 30% - 40%
  - 40% - 50%
  - 50% - 60%
  - 60% - 70%
  - 70% - 80%
  - 80% - 90%

Population = 0  
Source: Metro 2004; US Census Bureau, 2000



**Figure 4-8**  
Environmental Justice Study Area  
Low-Income Population  
Below Two Times the Poverty Line



**I-5: Delta Park  
(Victory Boulevard to Lombard Section)**

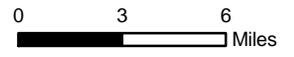
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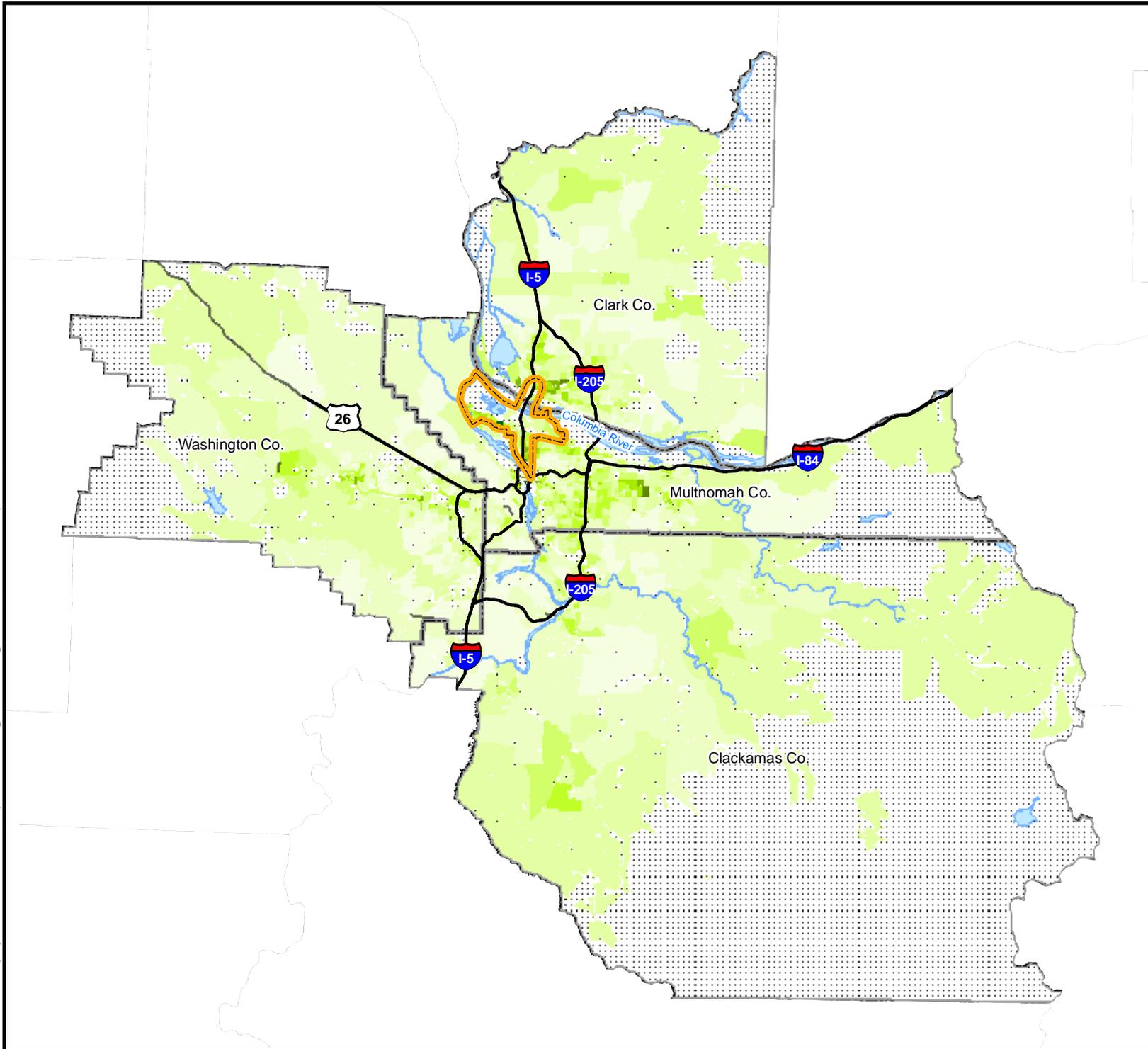
- Study Area Boundary
- Highways
- Counties
- Rivers and Streams
- Percent Below 2x the Poverty Line (By Census Block Group)
  - 0% - 10%
  - 10% - 20%
  - 20% - 30%
  - 30% - 40%
  - 40% - 50%
  - 50% - 60%
  - 60% - 70%
  - 70% - 80%
  - 80% - 90%
- Population = 0

Source: Metro 2004; US Census Bureau, 2000



**Figure 4-9**

Portion of Portland SMSA  
Low-Income Population  
Below Two Times the Poverty Line



**I-5: Delta Park  
(Victory Boulevard to  
Lombard Section)**

Multnomah County,  
Oregon



**Legend**

- Study Area Boundary
- Highways
- Counties
- Rivers and Streams

Percent Below 2x the Poverty  
Line (By Census Block Group)

- 0% - 10%
- 10% - 20%
- 20% - 30%
- 30% - 40%
- 40% - 50%
- 50% - 60%
- 60% - 70%
- 70% - 80%
- 80% - 90%

Population = 0

Source: Metro 2004; US Census Bureau, 2000



0 6 12  
Miles

**Figure 4-10**

Portland SMSA  
Low-Income Population-  
Below Two Times the Poverty Line