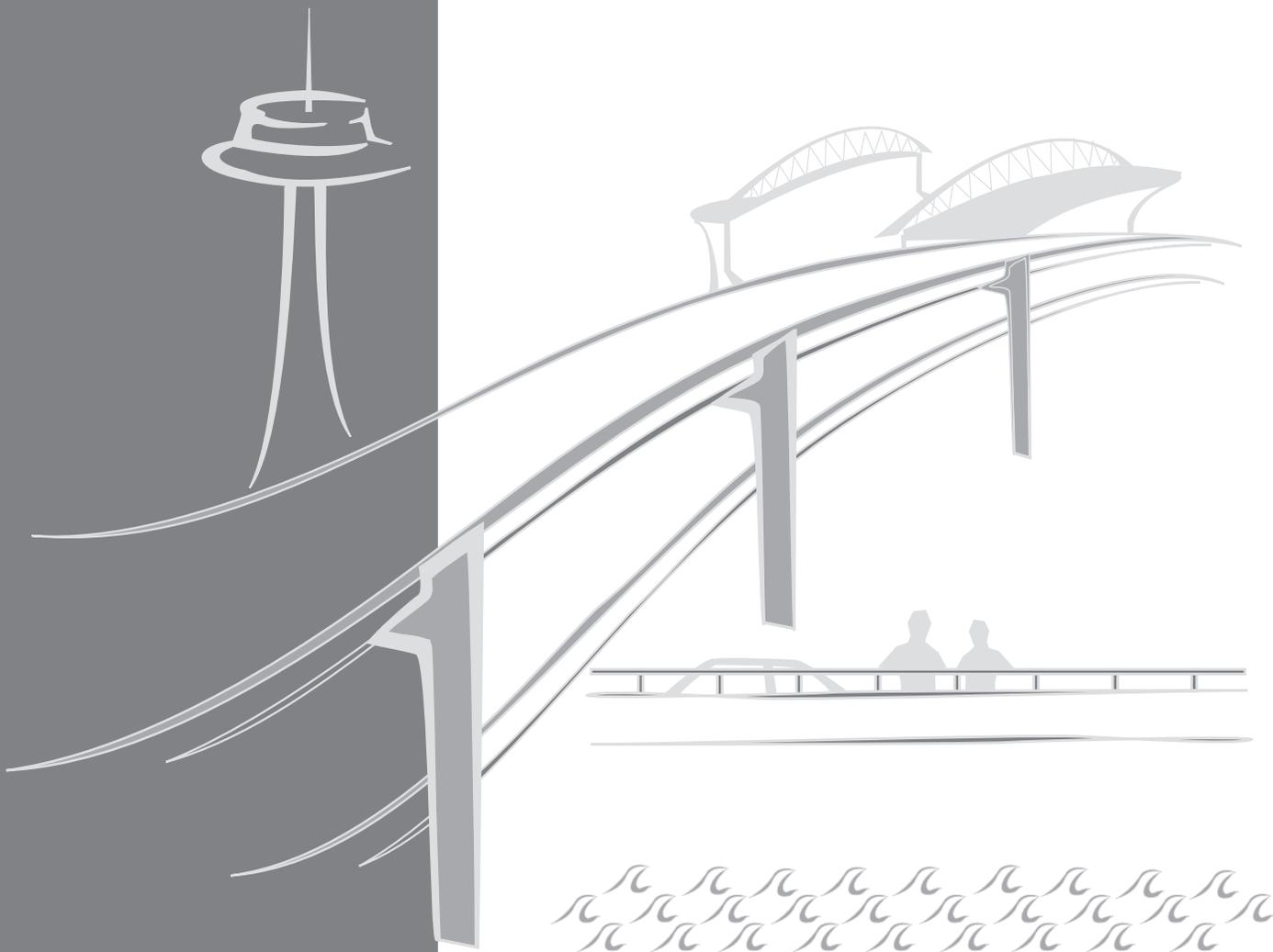


SR 99: ALASKAN WAY VIADUCT &
SEAWALL REPLACEMENT PROJECT

Draft Environmental Impact Statement Appendix I Social Resources Technical Memorandum



MARCH 2004

Submitted by:
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SR 99: ALASKAN WAY VIADUCT & SEAWALL REPLACEMENT PROJECT

Draft EIS Social Resources Technical Memorandum

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Submitted to:

Washington State Department of Transportation

Alaskan Way Viaduct and Seawall Replacement Project Office

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The SR 99: Alaskan Way Viaduct & Seawall Replacement Project is a joint effort between the Washington State Department of Transportation (WSDOT), the City of Seattle, and the Federal Highway Administration (FHWA). To conduct this project, WSDOT contracted with:

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ATTACHMENTS

ATTACHMENT A	Street Maps of the Project Study Area
ATTACHMENT B	Detailed Population and Demographic Characteristics of the Project Study Area
ATTACHMENT C	List of Preparers

ACRONYMS

BNSF	Burlington Northern Santa Fe Railway Company
DSHS	Department of Social and Health Services
ECEAP	Early Childhood Education and Assistance Program
EIS	environmental impact statement
ESD	Washington State Employment Security Department
FHWA	Federal Highway Administration
NEPA	National Environmental Policy Act
OFM	Washington State Office of Financial Management
SEPA	Washington State Environmental Policy Act
SIG	Seattle International Gateway
SMSA	Standard Metropolitan Statistical Area
SR	State Route
WSDOT	Washington State Department of Transportation

GLOSSARY

Block Group	A subdivision of a census tract, a block group is the smallest geographic unit for which the Census Bureau tabulates sample data.
Census	The census of population and housing is taken by the Census Bureau in years ending in zero. The census form includes both a short form (100% survey) and a long form (sample survey of one in six households).
Census Tract	This is a small, relatively permanent statistical subdivision for the purpose of presenting data. Census tract boundaries normally follow visible features, but may follow governmental unit boundaries or other non-visible features. Census tracts average about 4,000 inhabitants.
Hispanic/Latino	A self-designated classification for people whose origins are from Spain, the Spanish-speaking countries of Central or South America, the Caribbean, or those identifying themselves generally as Spanish, Spanish-American, etc. Origin can be viewed as ancestry, nationality, or country of birth of the person or person's parents or ancestors. Hispanic/Latino persons may be of any race, White and Non-White (Persons of Color).
Median	A value in an ordered set of values below and above which there is an equal number of values.
Race	Race is a self-identification characteristic of population and in 2000 included White and Non-White (Persons of Color). Non-White includes Black or African-American alone, American Indian or Alaska Native alone, Asian alone, Native Hawaiian or other Pacific Islander alone, some other race alone, or a mixture of two or more races. Non-White can include persons of Hispanic/Latino heritage. Some Hispanic/Latinos, however, are White.
Social Resources	Social elements of the environment, including population, housing, community facilities, religious institutions, social and employment services, cultural and social institutions, government institutions, military installations, and neighborhood cohesion.

Chapter 1 SUMMARY

This chapter summarizes the findings of research and analysis of potential environmental impacts on social elements of the environment from the construction and operation of the Alaskan Way Viaduct and Seawall Replacement Project (AWV Project). Local, state, and federal transportation agencies have been working together for more than two years to develop and evaluate alternatives to improve SR 99, including the Alaskan Way Viaduct and the Seawall. The project alternatives are evaluated in this Draft Environmental Impact Statement (EIS) as required by the Washington State Environmental Policy Act (SEPA) and the National Environmental Policy Act (NEPA).

This technical memorandum provides detailed information about the social context of the project corridor and potential effects that could directly or indirectly result from each of the project alternatives. The following sections summarize project background, the affected social environment, potential impacts to the neighborhood and larger community, and recommended mitigation for the project alternatives. The last section compares the impacts to social resources associated with the proposed project alternatives.

1.1 Background

The City of Seattle and the Washington State Department of Transportation (WSDOT) propose to make improvements to SR 99 in downtown Seattle. This roadway is one of two major north-south highways that provides access to and through the downtown urban core. SR 99 traverses the light industrial and manufacturing area south of downtown, follows the city's central waterfront, and then turns inland before continuing northwards. This portion of the city's central waterfront is defined by the seawall.

S. Spokane Street is the southern terminus of the project corridor, and Ward Street is the northern terminus. In the analysis related to the affected environment or impacts to SR 99, the corridor is evaluated for each of four segments. The south segment covers the area from S. Spokane Street north to S. King Street. The central segment covers the area from S. King Street to the south portal of the Battery Street Tunnel near First Avenue. The north waterfront segment continues along the waterfront as far north as Myrtle Edwards Park near Broad Street. The north segment continues from the south portal of the Battery Street Tunnel north on Aurora Avenue N. to Ward Street. Discussion of the affected environment and potential impacts resulting from the construction and operation of the seawall Build Alternatives are

separately discussed, though the affected area overlaps with portions of both the central and north waterfront segments.

Improvements are proposed due to the age, poor condition, and seismic vulnerability of this portion of SR 99. The soils in this corridor are primarily unconsolidated or fill material. The instability of the soils combined with periodic earthquakes have caused cumulative damage to the 50-year-old structure. The elevated portion of the roadway along the central waterfront, commonly referred to as the Alaskan Way Viaduct, is in especially poor condition. Recent inspections of the seawall along the downtown waterfront have indicated that this structure is also in extremely poor condition due to age, earthquake damage, and damage to timber supports from infestations of small marine invertebrates.

At this time, the City of Seattle and WSDOT have developed five alternatives to rebuild or reconstruct the SR 99 roadway. Key attributes of these alternatives along the downtown waterfront include the following:

- Rebuild the SR 99 viaduct and surface roadway in its current location.
- Construct a new aerial structure in essentially the same location as the existing structure.
- Construct a new underground tunnel and remove the existing aerial structure.
- Construct a smaller tunnel and remove the existing aerial structure.
- Remove the existing aerial structure and widen the existing surface street arterial.

Each of these alternatives also includes proposed methods to rebuild or reconstruct the seawall. Improvement of the roadway followed by construction activities to improve the seawall, and vice versa, would prolong disruption to the community within the same corridor. In addition, engineering design options for the two tunnel alternatives could allow the exterior wall of the tunnel structure to function as a seawall. For these reasons, improvements to the viaduct and seawall are being considered concurrently.

In addition to the proposed project alternatives, the No Build Alternative is evaluated. Three scenarios are considered for this alternative. Scenario 1 assumes the existing roadway and seawall will continue to be operated and repaired as needed, no major improvements will be made to the existing structures, and the facilities would likely be replaced before 2030. Scenario 2 assumes a moderate earthquake would occur in the near future and damage would occur to the existing facilities. Scenario 3 assumes a substantial

earthquake would occur and the existing facilities would likely experience catastrophic damage and/or collapse.

1.2 Social Resources

This technical memorandum discusses the potential impacts to social elements of the environment. Topics addressed include population, housing, community facilities, religious institutions, social and employment services, cultural and social institutions, government institutions, military installations, and neighborhood cohesion. In this report, these topics are collectively referred to as social resources. Other issues typically included as social resources based on guidelines in the WSDOT Environmental Procedures Manual (March 2003) include parks and recreation, public services and utilities, and environmental justice. For this project, each of these related topics is discussed in separate technical memoranda (see list below).

In addition, due to the interdisciplinary analysis of potential impacts on social resources, especially related to neighborhood cohesion, other technical memoranda and discipline reports were reviewed as part of the analysis. These other documents include:

Appendix C, Transportation Discipline Report

Appendix F, Noise and Vibration Discipline Report

Appendix G, Land Use and Shorelines Technical Memorandum

Appendix H, Parks and Recreation Technical Memorandum

Appendix J, Environmental Justice Technical Memorandum

Appendix K, Relocations Technical Memorandum

Appendix O, Public Services and Utilities Technical Memorandum

Appendix P, Economics Technical Memorandum

Appendix Q, Air Quality Discipline Report

Recorded verbal and written comments submitted at the project scoping meeting and many public involvement meetings, workshops, and briefings were also reviewed to better understand public perceptions of potential impacts to social resources.

1.3 Affected Environment

The project corridor traverses downtown Seattle, which is a dense urban environment with many social resources. The corridor traverses the city's light industrial and manufacturing area, the Port of Seattle container ship

loading area, the business and government center, the financial district, the waterfront tourist-oriented shops and attractions, the downtown commercial center, two historic districts, and mixed residential neighborhoods. The area has historic buildings, two large professional sports team stadiums, high-rise offices and residential condominiums, large department stores, small boutiques, older residential apartment buildings, big hotels and conference centers, and the many social and cultural institutions typical of a large metropolitan city.

The study area for analysis of potential social impacts is defined as the area within approximately 0.5 mile, or five city blocks, to either side of the project corridor. This study area captures the residents, buildings, and neighborhoods that would most likely be directly affected by the construction and operation of the proposed project. Potential effects could occur from right-of-way acquisition, construction activities, operation of temporary structures, and construction period detours, as well as the operation of the rebuilt or newly constructed roadway and seawall facilities.

The population of the study area consists of residents, employers, employees, visitors, and others. The residents may or may not be workers in the study area. Visitors that go to the downtown area to shop or attend cultural or sports events may reside in other Seattle neighborhoods or cities and towns in the metro area. Visitors include others from outside of the region.

The residents of the study area are a particularly diverse group of people. They include many Persons of Color (Black/African American, American Indian, Alaskan Native, Asian, Pacific Islander, and Others) and Hispanic/Latinos. They are primarily single-person households, but increasingly family households with children. Some are disabled, some have transportation mobility limitations, and many are reliant upon public transportation for their mobility. The residents in the study area include some of the city's richest and poorest residents. They reside in luxury downtown condominiums and apartment buildings, older apartment buildings and converted old hotels, subsidized residential buildings, or shelters for homeless persons. Some homeless people live under and around the viaduct. To assist the many moderate- and low-income persons, many social service agencies and non-profit organizations are located in the study area.

The study area spans an area extending from S. Spokane Street in the south to Ward Street. A total of seven City-designated neighborhood planning areas are crossed by or adjacent to the study area; these are (from south to north) the Duwamish, Pioneer Square, Commercial Core, Belltown, Uptown, Denny Triangle, and South Lake Union neighborhoods. The study area is not a single cohesive community, but rather a number of neighborhoods. Each of

these neighborhoods has its own character defined by the physical obstructions (including the viaduct), access to and from as well as within the neighborhood, mix of land uses, building size and scale, predominant building age and architectural style, mix of residents, and typical social interaction within the neighborhood.

1.4 Impacts and Benefits

Operational and construction effects on social resources of the environment are summarized below. They are based on engineering design, access, congestion, travel time and duration. In addition, they are based on the amount and type of properties acquired to construct the proposed project alternatives.

1.4.1 Operational Impacts

In many ways, the types of operational effects that will be experienced by social resources under all of the Build Alternatives will be similar. Relatively few properties would be acquired considering the dense urban environment, and only a few social resources will be affected under any of the alternatives. Residents, workers, businesses, and others, however, may need to adjust to changes in travel routes and travel times to and from the study area as well as within the neighborhoods.

In total, an estimated 14 to 33 parcels will be acquired for needed rights-of-way. This will displace between 8 and 20 structures. An estimated 273 to 581 jobs also would be displaced. No residential buildings will be acquired for construction of any of the Build Alternatives. Up to two of the displacements are neighborhood retail commercial businesses (a restaurant and a retail shop). All Build Alternatives will require modifying access to the Colman Dock Ferry Terminal to ensure access during construction. A portion of Terminal 46, which comprises several parcels, will be acquired, displacing three structures.

Two social resources could be directly affected by right-of-way acquisition. In the south segment of the Surface Alternative, right-of-way acquisition may require purchase of the property and building that currently houses the International Longshoremen's and Warehousemen's Union (Local 19). Under all alternatives, the acquisition of property owned by Seattle City Light would displace a social service that leases the property. At this site, CASA Latina operates their Day Workers' Center for day labor referrals. Potential relocation issues associated with these acquisitions is further discussed in Appendix K, Relocations Technical Memorandum.

Impacts on study area neighborhoods will differ by project alternative. The Rebuild and Aerial Alternatives will not result in substantial changes in the existing pattern of pedestrian or vehicular access in the study area. Less than 20 percent of existing parking spaces would be lost. The on- and off-ramps to SR 99 will be similar to current conditions, except the Battery Street and Western Avenue ramps will be re-designated for emergency use only.

The Tunnel, Bypass Tunnel, and Surface Alternatives will result in the removal of the existing aerial structure that is both a physical and visual obstruction to the waterfront area. The Tunnel and Bypass Tunnel Alternatives would result in a parking space reduction of 33 and 35 percent, respectively. The Tunnel Alternative will reduce traffic along the waterfront and associated noise and dust, but changes in ramp locations will likely create new disruptions, primarily increases in congestion, in neighborhoods located south and north of the Commercial Core.

Increased traffic volumes will characterize the northern section of Alaskan Way surface street. This is due to the construction of new ramps near Pike Street, which will affect the direct access to several cultural institutions, government institutions, and large residential complexes. The Bypass Tunnel Alternative will reroute through traffic into a tunnel along the waterfront, but downtown traffic will exit SR 99 to the north or south of the downtown core. This change in ramps will result in somewhat increased traffic congestion and disruption to neighborhoods north and south of downtown as well as along the waterfront. These effects caused by the Bypass Tunnel Alternative, however, will not be as great as the levels caused by the Tunnel Alternative.

The Surface Alternative will create impacts to study area residents and neighborhoods. The overall capacity of this alternative is less than the capacity of the other alternatives. Traffic congestion, noise, dust, and other disruptions to neighborhoods will occur along the length of the new roadway as well as on some adjacent parallel arterial roadways. This alternative will result in the removal of the existing physical and visual obstruction created by the existing aerial structure, but will replace it with a widened and congested principal arterial, which may act as a barrier that separates the waterfront area from adjacent neighborhoods. This alternative will result in a 35 percent reduction in available parking in the area and the wide, congested roadway may discourage pedestrians from attempting to cross the several lanes of congested traffic.

1.4.2 Operational Benefits

The construction of the proposed Build Alternatives will provide the residents of Seattle and the metropolitan region a number of important benefits. For all

of the Build Alternatives, most existing conditions of social resources will remain unchanged. An interchange will be constructed between SR 99 and SR 519 to facilitate vehicular and transit access to and from the stadium area to other Seattle neighborhoods and regional destinations. Access to the Colman Dock Ferry Terminal will be modified to ensure access during project construction. Traffic congestion will likely be reduced in the immediate neighborhood surrounding the existing Battery Street and Western Avenue ramps, which will be closed (except for emergency use) to improve traffic safety. The seawall will be reconstructed for long-term continued use of Seattle's central waterfront area museums, tourist attractions, and Port of Seattle offices.

Some of the proposed Build Alternatives will have additional benefits. The Aerial and Tunnel Alternatives will result in widening Mercer Street and constructing a Thomas Street bridge over Aurora Avenue N., which will improve traffic circulation in both the South Lake Union and Uptown neighborhoods. This change will also benefit these neighborhoods by improving connectivity with adjacent neighborhoods. The Tunnel and Bypass Tunnel Alternatives result in these same benefits plus the removal of the existing aerial structure and downtown ramps, which will reduce downtown traffic congestion and noise, improve neighborhood connectivity to the waterfront, and likely improve quality of life for both residents and workers. The Surface Alternative results in a greater increase in connectivity to Seattle's downtown by directing all traffic to use a widened Alaskan Way surface street with signals at most intersections along the central waterfront. For additional information, see Appendix C, Transportation Discipline Report.

1.4.3 Construction Impacts

The extent of the construction effects on social resources is similar for all of the Build Alternatives. None of the alternatives is anticipated to create a demand for specialized workers such that people would move to the region for work. For additional details, please see Appendix P, Economics Technical Memorandum.

The social resources impact area is defined based on the extent of noise impacts from construction activities. The anticipated noise level increases will primarily affect an area of approximately two blocks to either side of the project corridor and major detour route corridors.

Generally, residential buildings will be affected substantially more than community facilities, religious institutions, social and employment services, cultural and social institutions, and government institutions. In all, approximately 6,183 dwelling units (9,700 persons) are located within close

proximity (approximately one to two blocks) of the construction area. Almost two-thirds (62 percent) of corridor residents live in the central segment, though large numbers also live in the north waterfront and north segments.

Approximately 25 percent of the people who live in block groups along the corridor are low-income (based on 2000 census tract block group data). Approximately 38 percent of the residents living within two blocks of the project corridor in the south segment appear to be low-income persons, primarily living in one of the several homeless shelters in the area.

A small number of social resources are in close proximity to the SR 99 corridor. These include two educational facilities, one religious institution, three social or employment services organizations, three cultural institutions, and two government institutions. Social resources adjacent to the anticipated construction zone for rebuilding or constructing a new seawall include the Colman Dock Ferry Terminal, Seattle Aquarium, Seattle Art Institute, Odyssey Maritime Discovery Center, and Port of Seattle offices. Temporary changes in access for vehicles, transit, and pedestrians during the construction period are expected.

Road closures, rerouting of traffic, and temporary pedestrian pathways will create hardship and stress upon some individuals, especially those with mobility limitations. The effects of construction will change the daily patterns of both residents and workers in neighborhoods. Accommodation of changes in access to transit and pedestrian routes would be more difficult for low-income persons, disabled persons with mobility limitations, and persons who are transit-dependent. Such changes will affect their daily lives as well as their ability to access community and social services. Construction activities, including those at potential staging areas and along detour routes will generally result in temporary increases in traffic congestion, noise, dust, and light and glare. These changes in the community, though temporary, will endure for between 7.5 and 11 years of construction, depending on which alternative is constructed. The long duration of construction will appear to be almost “permanent” for many residents.

1.4.4 Secondary and Cumulative Impacts

For all of the project alternatives, secondary effects will likely affect residents, community institutions, and organizations, as well as neighborhood cohesion. The most substantial effects will occur due to changes in the number and location of on- and off-ramps for SR 99. In addition, changes in the alignment different from the existing roadway and/or changes in the design of the project from an aerial structure to either a surface or tunnel alternative may change social interaction in neighborhoods of the study area. All of these

changes may result in long-term changes in the number and types of residential, retail, office, commercial, and/or industrial land uses in a neighborhood.

Many plans have been proposed for other transportation improvement and land use development projects in close proximity to the project corridor. Other transportation projects include Central Link light rail, the Colman Dock Ferry Terminal expansion, reconstruction of the Mercer Street corridor, the Monorail Green Line, SR 519, and possible redevelopment of Terminal 46. In addition, hundreds of residential units, retail space, and office development have been proposed in the project study area. As such, the cumulative effects of the proposed AWW Project on social resources in the community will not likely result in the only substantial changes to the study area. But together, all of the proposed transportation and urban development projects will gradually change the character (land uses, density, streetscape, etc.) of neighborhoods in the project study area.

1.5 Differences Between the Build Alternatives

This section compares and contrasts anticipated impacts on social resources in the project study area. Exhibit 1-1 presents a comparison of both construction and operational impacts for each of the project Build Alternatives. Exhibit 1-1 shows that construction impacts of the Build Alternatives are quite similar.

The length of the construction period for the Rebuild and Surface Alternatives is estimated to be nearly the same—a total of 7.5 and 8 years, respectively. The Rebuild Alternative will likely result in fewer construction impacts compared to the other alternatives. No impacts will occur in the north segment with the Rebuild Alternative. It will affect the fewest residents within two blocks of the construction zone and the fewest social resources adjacent to the construction zone. The Rebuild Alternative does not require a long-term traffic detour.

The Surface Alternative will have a similar duration for construction activities, but will require two major construction detours. The Surface Alternative will affect the most social resources. The duration of construction impacts for the Tunnel and Bypass Tunnel Alternatives will be 8 and 8.5 years, respectively. The construction effects for the Tunnel and Bypass Tunnel Alternatives will be the same. The Aerial Alternative has the longest construction period (11 years) and nearly the same construction effects as the Tunnel and Bypass Tunnel Alternatives. Considering the construction impacts of the Build Alternatives, the relative ranking of the alternatives (assuming that shorter construction periods are best) would be as follows:

- Fewest impacts for the shortest duration – Rebuild Alternative
- Most impacts during the next shortest duration – Surface Alternative
- Moderate impacts for a moderate duration – Tunnel and Bypass Tunnel Alternatives
- Moderate impacts for the longest duration – Aerial Alternative

Exhibit 1-1 also presents several variables that indicate the potential operational effects of the Build Alternatives on social resources. Overall, the direct long-term effects on social resources are very few. The Surface Alternative requires the purchase of property that currently houses an employment service in the community—the International Longshoremen’s and Warehousemen’s Union (Local 19). All of the alternatives require the relocation of one property—the historic Washington Street Boat Landing. All of the alternatives require displacement of a social resource (the CASA Latina Day Workers’ Center) currently leasing property that would be acquired.

The design of the Build Alternatives, however, will have an effect on project study area neighborhoods. Residents, workers, community facilities, social and employment services, religious institutions, cultural and social institutions, and government institutions will all likely be affected. The different Build Alternatives change existing access to and from the study area neighborhoods as well as access within neighborhoods. In particular, the change and total number of ramps provided by the Build Alternatives will cause increased or decreased vehicular and transit access to downtown areas based on the number of limited arterial off-ramps and/or signalized street intersections. These changes from current conditions potentially could change the long-term cohesion of project corridor neighborhoods.

Each of the alternatives will result in removing some existing ramps, keeping other existing ramps, and/or constructing new ramps. The existing SR 99 has a total of five ramp couplets (one on- and one off-ramp located in close proximity) that provide access to neighborhoods north and south of the downtown area as well as ramps to the downtown core. The Bypass Tunnel and Tunnel Alternatives will have only two and three ramp couplets, respectively. In addition, each of these alternatives will involve the removal of two existing ramp couplets. In contrast, the Surface Alternative will require the removal of all existing ramps, but will establish many more at-grade signalized intersections for traffic to access the downtown neighborhoods. The Surface Alternative provides greatly increased (beneficial) connectivity with local streets and between neighborhoods compared to any of the other Build Alternatives. The Rebuild and the Aerial Alternatives will be most similar to existing conditions.

Exhibit 1-1. Comparison of Social Impacts of the Alternatives

Issues	Rebuild	Aerial	Tunnel	Bypass Tunnel	Surface
Construction (short-term)					
Construction Duration (years)	7.5	11	9	8.5	8
Corridor Segments Affected	Not North	All	All	All	All
Detours for Traffic	None	Broad St. Thomas St	Broad St Thomas St	Broad St Thomas St	Broad St Thomas St
Affected Population (2 blocks)					
- Total Residents	7,393	9,759	9,759	9,759	9,759
- Low-Income Residents	1,779	1,895	1,895	1,895	1,895
Adjacent Social Resources					
- Residential	15	17	18	18	21
- Community Facilities	0	3	3	3	2
- Religious Institutions	0	1	1	1	1
- Social/Employment	0	1	1	1	1
- Cultural/Social Institutions	3	4	4	4	4
- Government Institutions	5	6	6	6	6
- Total	23	32	33	33	35
Operation (long-term)					
Parcel Acquisitions	14	18	20	20	33
Land Uses Displaced					
- Residential Buildings	0	0	0	0	0
- Retail Businesses	0	0	2	2	1
- Office/Industrial Structures	8	8	10	10	20
Social Resources Displaced					
- Community Facilities	0	0	0	0	0
- Religious Institutions	0	0	0	0	0
- Social/Employment	1 (Full)	1 (Full)	1 (Full)	1 (Full)	2 (Full)
- Cultural/Social Institutions	0	0	0	0	0
- Government Institutions	1 (Partial)	1 (Partial)	1 (Partial)	1 (Partial)	1 (Partial)
Jobs Affected by Acquisitions	334	273	356	356	581
SR 99 CBD Access (connectivity)	Same	Same	Fewer ramps	Fewer ramps	No freeway ramps, all signalized intersections
Congested Street Intersections	15	17	16	16	23
Parking Spaces Reduced	-270 (13%)	-360 (18%)	-670 (33%)	-710 (35%)	-720 (35%)
Improved Cohesion (fewer barriers, more linkage)					
- Waterfront	No	No	Yes	Yes	Potentially
- South Lake Union	No	Minor	Minor	Minor	Minor

Note: Surface Alternative acquisitions would be similar to the Tunnel and Bypass Tunnel Alternatives if the tail track extended north of the S. Royal Brougham Way.

1.6 Types of Mitigation

Mitigation measures are recommended to avoid, minimize, or eliminate the effects of the proposed project. Both operational and construction mitigation measures are presented below. This list only addresses mitigation measures specifically identified in this technical memorandum to address construction and operation impacts. Additional mitigation measures that will help to avoid, reduce, or minimize potential social impacts are also discussed in other technical memoranda or discipline reports. In particular, the reader should review mitigation measures addressing potential adverse effects to transportation, noise and vibration, land use and shorelines, parks and recreation, environmental justice, relocation, public services and utilities, economic, and air quality elements of the environment.

1.6.1 Operational Mitigation Measures

The following is a brief list of the key operational mitigation measures recommended for the proposed project. The changes in traffic access, routes, congestion, travel time, and parking all affect the interaction, behavior, routine, and daily patterns of people. Mitigation of adverse impacts on social resources addresses how impacts on human behavior can be avoided, minimized, or reduced. Communication of anticipated changes can substantially reduce the effects of such impacts. Recommended operational mitigation measures include the following:

- Work with neighborhood groups during final engineering design to address potential site-specific adverse social resource effects from the selected Build Alternative.
- Prior to the opening of the new facilities, plan and implement a substantial advertising campaign to alert and educate members of the public, community facilities, and organizations about the planned opening of the facilities and how the transportation network will work. Translate communication materials into foreign languages commonly spoken by residents in the project area.
- Coordinate the opening of the new facilities with all other providers of transportation (bus, light rail, train, trolley, monorail, taxi, etc.) so they may make plans to adjust their services to seamlessly meet public demand.
- Install an extensive network of temporary signs to guide vehicular and transit users of the new facilities. Consider using a special opening-event logo or theme so that signs are easily recognizable.

1.6.2 Construction Mitigation Measures

The following is a brief list of the key construction mitigation measures recommended for the proposed project. A more extensive list of mitigation measures is included in the body of the text. As the anticipated construction effects on social resources are likely to be similar from one alternative to another, these mitigation measures are recommended for all Build Alternatives.

- Prior to the start of construction, coordinate final efforts to develop mitigation measures with those who will be most affected by the construction of the selected alternative. Consider contacting residents, workers, businesses, community institutions, and social service organizations.
- Communicate planned construction activities (especially road closures, traffic detours, and changed pedestrian pathways) to the public. A wide spectrum of techniques and media should be used to convey planned construction activities. Messages should be translated into the most common languages spoken by residents of the project study area.
- Planned construction activities should be coordinated with providers of all other modes of transportation to enable them to adjust their services and seamlessly meet the needs of the public. This is especially important for providers who serve disabled persons with mobility limitations and persons reliant upon public transportation for the majority of their mobility needs.
- Use a wide spectrum of public outreach methods to instruct members of the public about how they may submit complaints, problems, and suggestions related to construction activities. Efforts will be made to ensure potential problems are resolved quickly.
- Monitor construction mitigation measures to ensure they are effective. Establish a process by which mitigation measures can be modified on an ongoing basis during construction.

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Chapter 2 METHODOLOGY

This chapter summarizes the methodology used to conduct the analysis presented in this technical memorandum. These topics include a review of pertinent government regulations and guidelines, definitions of terms used in this report, general sources of data and information, and specific information guiding the use and analysis of census data. The two last sections describe how the assessment of impacts was conducted and the organization of this document.

2.1 Regulatory Overview

The analysis of potential social impacts from the proposed AWW Project follows federal, State, and City laws, regulations, and guidelines. They include the following:

- National Environmental Policy Act (NEPA)
- Title VI of the Civil Rights Act of 1964
- Title 49 of the Code of Federal Regulations Part 21, Nondiscrimination in Federally Assisted Programs of the Department of Transportation, Effectuation of Title VI of the Civil Rights Act of 1964
- Title 23 of the United States Code Section 109(h), Federal Highway Administration Effectuation of Title VI of the Civil Rights Act of 1964
- Governor's Executive Order 93-07, Affirming Commitment to Diversity and Equity in the Service Delivery and in the Communities of the State.
- Washington State Environmental Policy Act (SEPA)

The federal and State guidelines include the following:

- Federal Highway Administration (FHWA) NEPA Guidelines
- FHWA Technical Advisory T6640.8A Guidance for Preparing and Processing Environmental and Section 4(f) Documents
- FHWA's Community Impact Assessment: A Quick Reference for Transportation
- WSDOT Environmental Procedures Manual Section 457 (March 2003)
- The City of Seattle's environmental policies and SEPA procedures (Seattle Municipal Code 25.05)

2.2 Use of Terms

To avoid misunderstanding and confusion, several key terms used in the analysis are defined below. A general glossary and list of acronyms follows

the Table of Contents at the beginning of this document. Additional terms are as follows:

- Project Corridor** - The project corridor encompasses the alignments and rights-of-way of the existing roadway and all of the project alternatives. The area generally extends along SR 99 from S. Spokane Street, through the downtown waterfront area, the Battery Street Tunnel, and north along Aurora Avenue N. to Ward Street. Some alternatives, however, do not extend as far south as S. Spokane Street and/or north to Ward Street. The project corridor also includes Elliott and Western Avenues and the waterfront area from approximately Pine Street north to Broad Street. In addition, the proposed project corridor includes Broad Street from the waterfront east to Aurora Avenue N.
- Study Area** - The area for this analysis of potential social resource impacts is defined primarily by the area that extends approximately 0.5 mile, or five blocks, to either side of the project corridor. Much of the analysis, however, is defined by the census tract block groups that encompass the project corridor.

Attachment A at the back of this report contains three street maps that cover both the project corridor as well as the larger project area. These maps help to show the physical proximity of social resources to the alignment of the proposed project alternatives and anticipated construction activities.

2.3 Data and Information

Data was collected from a variety of federal, state, and local sources. A major portion of the descriptive analysis relies on 1990 and 2000 statistics published by the U.S Bureau of the Census. Information also was obtained from local government agency web pages on the Internet. Information about social services located in downtown Seattle was reviewed to inventory the number and types of special housing and social and employment services located in the study area. In addition, the Yahoo! Yellow Pages <<http://yp.yahoo.com/>> were used to identify businesses as well as community facilities and social institutions located in the study area.

Particular community issues were identified through review of *Seattle's Comprehensive Plan* (City of Seattle, July 2000 as amended). In particular, the adopted goals and policies for the city-designated neighborhoods traversed by the project corridor were studied. These neighborhoods include the

following: Duwamish, Pioneer Square, Commercial Core, Belltown, Denny Triangle, Uptown, and South Lake Union.

Records of public comment on the AWW Project were studied, particularly those submitted at the scoping meetings and the many public information meetings. Additional information was obtained from meeting notes from the many public outreach activities. See Section 3.3 in this memorandum as well as Appendix A, Agency and Public Coordination, for detailed information.

Additional information used in the analysis of potential impacts to social resources was obtained from other technical memoranda and discipline reports prepared for the AWW Project. Section 3.1 lists all of these reports. In particular, the findings from a field survey of the types and sizes of businesses adjacent to the project corridor were reviewed. The detailed analysis of this information is contained in Appendix P, Economics Technical Memorandum.

2.4 Census Data Analysis

As mentioned above, much of the data analysis in this report, particularly population and demographic information, is based on statistics published by the U.S. Bureau of the Census. Data was collected for census tract block groups that approximated the study area. Generally, the study area defined by the census tract block groups is larger than the study area defined by the area encompassing five city blocks to either side of the project corridor.

The boundaries of some census tracts as well as some census tract block groups, however, changed slightly between 1990 and 2000. Generally, the boundary changes for the census tracts are not significant, and the census tract data of 1990 and 2000 are comparable. The boundary changes for the census tract block groups, however, were more substantial. Some block groups were divided to create two block groups where one block group existed before. In other cases, two block groups were combined to represent the same area previously represented by a single block group. The division and combining of block groups resulted in some renumbering of block groups. Because of such changes, the geographic area of block groups from one census to the next is not necessarily comparable.

Because the geographic area of block groups changed, the analysis presented in this memorandum summarizes data for the study area matching as closely as possible the geographic area covered by 1990 and 2000 census tract block groups. Only the summary tables are presented in the main body of the report. The detailed tables of the descriptive statistics are contained in Attachment B.

Census demographic statistics also were collected for the City of Seattle. The city demographic characteristics were used to evaluate how the characteristics of the study area are similar or different from those describing the entire city. Census figures from the 1990 census and the 2000 census for these two geographic areas are also compared and contrasted to evaluate changes over the past decade.

In addition, the analysis of demographic characteristics was used for other project activities. It was used to help develop and execute the public involvement activities (see Section 3.3). Public outreach activities were used to verify and/or substantiate the demographic characteristics identified by census data as well as other information descriptive of the project study area. Furthermore, much of the population and demographic data and analysis found in this document were used in the analysis of potential environmental justice impacts (see Appendix J, Environmental Justice Technical Memorandum).

2.5 Impact Assessment

The purpose of this report is to evaluate potential impacts to social resources as required by environmental regulations. Potential social resource impacts discussed in this report include the population and its demographic characteristics, city neighborhoods, housing, and community facilities and services. Impacts to community centers, educational facilities, cultural and social institutions, religious institutions, social service agencies, and government institutions are discussed. An assessment of potential changes that could occur to neighborhood cohesion as a result of the proposed project alternatives is also included. Other topics often included as part of the analysis of impacts to social resources as defined in the WSDOT *Environmental Procedures Manual* (March 2003) are discussed in separate technical memoranda. Full reports have been prepared covering the following issues: parks and recreation (Appendix H), environmental justice (Appendix J), public services and utilities (Appendix O).

Potential impacts to social resources can be adverse, beneficial, or a mixture of adverse and beneficial. They are defined by criteria to ensure like comparison. Potential effects could include substantial changes in the following:

- 1) Positive or negative changes in population or demographics that occur within a short period of time.
- 2) Reduced availability of housing or an increased cost of housing within a short period of time.

- 3) Negative changes in jobs that occur within a short period of time.
- 4) Purchase of right-of-way property that is actively used (land and/or buildings) by community facilities, religious institutions, social and employment services, cultural and social institutions, or government institutions including national defense installations.
- 5) Increased difficulty in pedestrian, vehicular, or transit access to community facilities, religious institutions, social and/or employment services, cultural or social institutions, or government institutions.
- 6) Establishment of neighborhood obstructions, deterioration in infrastructure, changes in linkages between community facilities, loss of neighborhood commercial businesses and services, loss of unique community identity, or other changes in the perceived quality of life that define neighborhood cohesion.

In contrast, beneficial social impacts include substantial changes in the following:

- 1) Future land use development consistent with local government comprehensive plans and zoning regulations supporting the routine needs of neighborhood residents and businesses.
- 2) Increased pedestrian, vehicular, and/or transit access resulting in improved linkages between residences, facilities, services within neighborhoods, and improved neighborhood cohesion.
- 3) Increased pedestrian, vehicular, and/or transit access resulting in improved connectivity between neighborhoods and communities outside of the project area and benefiting persons working and shopping in study area neighborhoods.
- 4) Reduced traffic congestion resulting in improved air quality, reduced noise levels, and generally improved human environment and quality of life in neighborhoods.
- 5) Improved pedestrian safety resulting in improved quality of life in neighborhoods.

A key factor in adverse impacts is whether or not a social resource is located on property that would be acquired for construction of one of the proposed project alternatives. Alternative engineering design, transportation system connectivity, travel routes and durations, local traffic congestion, and neighborhood parking availability (on-street and off-street) are other key factors affecting social resources long-term. Construction impacts, however, are more limited in geographic area and are chiefly limited to properties in

close proximity of the project corridor. This is primarily because noise impacts from anticipated construction activities would extend only an estimated two blocks from the project corridor. Construction traffic detours, however, could result in impacts to social resources some distance from the project corridor. Comparison of all of these issues for the project alternatives identifies quantifiable attributes and qualitative characteristics of both operational and construction impacts.

This information on operational and construction impacts will be used to compare and contrast the project alternatives, specifically regarding potential impacts to social resources. The final decision to select a preferred alternative for the AWW Project will be based on additional information that will address many factors and considerations beyond just potential impacts to social resources.

2.6 Document Organization

This Social Resources Technical Memorandum consists of 10 chapters plus three attachments. Chapter 3 briefly describes the studies and coordination conducted as part of the analysis. Chapter 4 provides a detailed description of existing social resources in the study area. Potential operational and construction impacts and benefits to these social resources are assessed in Chapters 5 and 6, respectively. Secondary and cumulative impacts are discussed in Chapter 7. Operational and construction mitigation measures are recommended in Chapters 8 and 9. Chapter 10 lists references consulted in the preparation of this report. Attachment A is a series of street maps of the project study area and beyond. Attachment B contains detailed population and demographic statistics of the project study area. Attachment C is a list of preparers.

Chapter 3 STUDIES AND COORDINATION

The analysis contained in this report is based on other studies and reports, as well as coordination with local and state government agencies, non-profit organizations, and members of the public. The following sections describe the studies, coordination efforts, and public involvement activities that contributed to the preparation of this report.

3.1 Studies

Due to the interdisciplinary context of the assessment of social impacts, many other technical memoranda and discipline reports prepared for the AWWV Project were consulted in preparation of this report. In particular, the following project documents were reviewed:

- Appendix A, Agency and Public Coordination
- Appendix B, Alternatives Description and Construction Methods Technical Memorandum
- Appendix C, Transportation Discipline Report
- Appendix D, Visual Quality Technical Memorandum
- Appendix F, Noise and Vibration Discipline Report
- Appendix G, Land Use and Shorelines Technical Memorandum
- Appendix H, Parks and Recreation Technical Memorandum
- Appendix J, Environmental Justice Technical Memorandum
- Appendix K, Relocations Technical Memorandum
- Appendix O, Public Services and Utilities Technical Memorandum
- Appendix P, Economics Technical Memorandum
- Appendix Q, Air Quality Discipline Report

A complete list of references used to prepare this document is contained in Chapter 10.

3.2 Coordination

A variety of local government organizations and non-profit agencies were contacted for information. Contact was made with the Washington Employment Security Department in order to obtain updated nonagricultural employment data for the counties of the Puget Sound region. This information was used to describe the economic base and stability of the project area.

The City of Seattle Department of Neighborhoods, Office of Housing, and the Seattle Housing Authority were contacted for information on housing, including low-income, emergency, and transitional housing. These agencies

provided databases with the name, address, number of units, and type of housing for individual buildings. The Archdiocesan Housing Authority and the Plymouth Housing Group were contacted about existing and proposed low-income housing in Seattle. Together this information was helpful in assessing potential effects on low-income and homeless persons.

The Crisis Clinic, a non-profit organization, provided information about social services (government and non-profit). The organization has a comprehensive database of social services, contacts, and brief descriptions of services provided. Child Care Resources and the Seattle School District were also contacted regarding childcare facilities and programs available in the downtown area.

Interviews were conducted with some social service agencies in the study area. The purpose of these interviews was to better understand the types of services provided, the agency's clientele, typical means of access to and from the agency or non-profit organization's building, and potential linkages between social service agencies located in downtown. In addition, the social service agencies were asked to identify their concerns about the proposed rebuilding or replacement of the viaduct and seawall. These interviews were part of an expanded public outreach communication program implemented for this project (see Section 3.3).

The development of this memorandum was closely coordinated with the three lead agencies involved in the project. These agencies include the FHWA, WSDOT, and the City of Seattle. A technical memo discussing the methodology proposed to conduct the analysis, an outline of the report, and an early draft of the affected environment chapter of this document were shared with these agencies and comments were solicited. A coordination meeting to discuss the proposed approach and initial findings of the analysis was held on June 25, 2003. Comments received at these times and during several subsequent reviews were incorporated into this document.

3.3 Public Involvement Activities

A very extensive public involvement and communication outreach program has been conducted in association with the project EIS scoping efforts. This program has been implemented on a nearly continual basis since June 2001.

From the beginning of project planning efforts, the project team was asked to develop a detailed public involvement plan. As time has passed and public comment has been evaluated, this plan has been updated and revised to meet the needs of the project communication outreach activities. For detailed information, please see the *Communications Strategy* (EnviroIssues 2003).

Public meetings, open houses, community briefings, and design workshops have been held. Interviews with local businesses, social service agencies, and community arts organizations have been conducted. In addition, briefings have been held for both elected officials and a citizen advisory group. Between June 2001 and December 2003, 15 public meetings and open houses, over 140 community briefings, and eight Community Leadership Group meetings have been held in the greater Seattle area.

As part of this effort, the public involvement consultant has developed a wide variety of materials to ensure widespread communication about the proposed project. The project team has prepared written materials (newsletters, brochures, and fact sheets), display boards, and a project web page. The general project fact sheet was translated into four foreign languages. These included Chinese, Tagalog, Vietnamese, and Spanish, which are the four most common foreign languages spoken by Seattle residents (U.S. Census 2000). Displays were set up at city and county libraries, community centers, and neighborhood service centers. In addition, a telephone hotline was established.

As public involvement activities have been conducted, public comments and responses from each individual event have been recorded. Summary notes have been prepared for each event and have been released to the project team on an ongoing basis. In addition, specific comments submitted by members of the public have been entered into a database of comments. Public comments related to social resources included the following:

- Construction traffic, noise, light and glare, and air quality.
- Construction detours and road closures that would affect pedestrian, vehicular, and transit access to and from neighborhoods as well as businesses, residences, community facilities, social services, and sports and cultural events.
- Long-term transportation network connectivity between downtown Seattle and its neighborhoods.
- Long-term pedestrian, vehicular, and transit access from downtown neighborhoods and the Seattle waterfront.
- Long-term opportunities to enhance the urban landscape of downtown Seattle neighborhoods.
- Long-term control and/or development of residual portions of property acquired for the construction of the proposed project for the benefit of local neighborhoods.

Appendix A, Agency and Public Coordination, provides additional information on public involvement activities and comments received.

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Chapter 4 AFFECTED ENVIRONMENT

This chapter describes the affected environment for social resources in the project study area. Topics discussed include regional and community growth, boundaries of the study area, population and demographics, housing, community facilities and services, social and employment services, cultural and social institutions, government institutions, and neighborhood cohesion. Other related topics, including parks and recreation (Appendix H), environmental justice (Appendix J), and public services and utilities (Appendix O) are discussed in separate reports (see Section 3.1).

4.1 Regional and Community Growth

This section describes growth trends of the Puget Sound region and helps to establish the socioeconomic context of the project study area. This discussion addresses regional population, employment, major employers, and regional economic stability.

4.1.1 Regional Population and Employment

The study area is located within the U.S. Census designated Seattle-Tacoma Standard Metropolitan Statistical Area (SMSA). This designation reflects the economic ties between the four centrally located Puget Sound counties (see Exhibit 4-1). Snohomish County is the most northern of the three counties. King County is centrally located, and Pierce County is located to the south. Kitsap County is located west of King County across the Puget Sound. Seattle is the county seat of King County and is located centrally on the Puget Sound coastline. The City of Tacoma is the county seat of Pierce County and the City of Everett is the county seat of Snohomish County.

Exhibit 4-2 shows the historical population trends for the four counties. Historically, King County has comprised more than 50 percent of the Puget Sound region's population and more than 30 percent of the total population of the state. The population of Pierce and Snohomish Counties are approximately equal, and each accounts for about 20 to 25 percent of the region's total population. The population of Kitsap County is by far the smallest, with only 7 percent of the region's total population. The three larger counties (King, Pierce, and Snohomish Counties) are the first, second, and third most populated counties in Washington, respectively.



Alaskan Way Viaduct 554-1585-025/06(0620) 2/04 (K)



**Exhibit 4-1
Map of the Puget
Sound Region**

Exhibit 4-2. Regional Population Trends, 1980–2003

Area	1980	1990	2000	2003	1990–2000 Avg. Annual Increase
King County	1,269,898	1,507,305	1,737,034	1,779,300	1.5%
Kitsap County	147,152	189,731	231,969	237,000	2.2%
Pierce County	485,667	586,203	700,820	733,700	2.0%
Snohomish County	337,720	465,628	606,024	637,500	3.0%
Metro area	2,240,437	2,748,867	3,275,847	3,387,500	1.9%
Washington State	4,132,353	4,844,663	5,894,121	6,098,300	2.1%

Source: OFM (2003a,b).

Over the past decade, the regional population increased by over 600,000 people, a substantial increase. Between 1990 and 2003, the population of King County increased by almost 272,000 persons. Pierce County increased by approximately 147,500 and Snohomish County by almost 172,000. In contrast, the population of Kitsap County only increased from 198,731 to 237,000. The average annual population increase for King County between 1990 and 2000 was 1.5 percent. The average annual increase for Pierce, Kitsap, and Snohomish Counties was 2.0, 2.2, and 3.0 percent, respectively. The average annual increase over this period for the region was just 1.9 percent compared to 2.1 percent for all of Washington. Though the population increase in King County was larger than for the other counties, population growth of adjacent counties occurred at a faster rate.

The City of Seattle is the largest city in King County. Of the 39 cities within the county, only six cities had an estimated population greater than 50,000 in 2003 (OFM 2003a). The population of Seattle in 2003 was 571,900 and the next largest city, Bellevue, was only 116,400. The other large cities include Kent, Federal Way, Renton, and Shoreline. Over 32 percent of the entire county's population, however, resides in Seattle.

Population forecasts for the region indicate that historical growth trends will likely continue. The Washington Office of Financial Management (OFM) published a 20-year population forecast for counties (OFM 2002). In the next 20 years, the population of the Puget Sound region is expected to continue to increase, though at slightly decreased average annual growth rates compared to past trends. The population of Washington State is expected to increase to over 7.5 million by 2020. The population of King County is forecasted to increase to approximately 2 million; Pierce and Snohomish Counties are expected to increase to almost 900,000 each, and Kitsap County is expected to increase to approximately 300,000. Average annual increases are anticipated to be less than 2 percent for the three smaller counties and less than 1 percent

for King County. Though population increases are expected to decrease somewhat, these rates indicate that relatively strong population growth can be expected for the four-county region in the future.

The chief reason for the increase in population is the overall size of the regional economy. The three larger counties include the first, second, and third largest countywide work force of all counties in the state. In 2002, these counties accounted for approximately 68 percent of all jobs in the state, but only 52 percent of the population (OFM 2003a; ESD 2003). A total of 75 percent of all of the region's jobs are located in King County (ESD 2003). Many workers commute to jobs in King County from Kitsap, Pierce, and Snohomish Counties. King County is clearly the economic engine of both the region and the state.

As the largest city in King County, Seattle has the major share of all jobs in the county. In 2000, the Puget Sound Regional Council reported a total of 540,419 jobs, which means that approximately 45 percent of King County's total number of jobs were located in Seattle (PSRC 2003). Approximately 70 percent of these jobs were equally spread among three sectors: manufacturing, trade/transportation/ utilities, and services.

The economic strength of the region and King County, however, is different than the rest of the state (see Exhibit 4-3). The Puget Sound region has only a small proportion of the total number of workers employed in the resource sectors of the economy. These sectors include agriculture, forestry, fishing, and mining. In contrast, the region has higher employment in the financial, wholesale trade, transportation, services, and manufacturing sectors of the economy. For additional detail and analysis on the regional and local economy, please see Appendix P, Economics Technical Memorandum.

Exhibit 4-3. Regional Average Annual Nonagricultural Employment, 2002

Economic Sector	King County	Pierce County	Snohomish County	Metro Area	Washington
Natural Resources & Mining	2,000	1,000	**	3,000	9,000
Construction	78,000	16,000	17,800	111,800	155,000
Manufacturing	165,000	20,000	45,700	230,700	286,000
Wholesale Trade	69,000	9,000	6,000	84,000	116,000
Retail Trade	144,000	29,000	27,000	200,000	306,000
Transportation, Warehousing, & Utilities	51,000	9,000	3,100	63,100	88,000
Information	73,000	3,000	3,700	79,700	94,000
Financial Activities	89,000	13,000	11,200	113,200	146,000
Professional & Business Services	180,000	20,000	16,100	216,100	290,000

**Exhibit 4-3. Regional Average Annual Nonagricultural Employment, 2002
(continued)**

Economic Sector	King County	Pierce County	Snohomish County	Metro Area	Washington
Education & Health Services	135,000	37,000	20,300	192,300	307,000
Leisure & Hospitality	119,000	24,000	17,800	160,800	245,000
Other Services	49,000	11,000	8,500	68,500	98,000
Government	200,000	52,000	34,500	286,500	516,000
TOTAL	1,355,000	243,000	212,300	1,810,300	2,655,000

Notes:

Equivalent 2002 fourth-quarter benchmark data for Kitsap County was not available.

** = data suppressed due to confidentiality.

Sums may not total due to rounding.

Source: ESD (2003).

4.1.2 Major Regional Employers

Today, the Seattle-Tacoma SMSA region has a diverse economy. It is a “national center for manufacturing, high technology industries, services, international trade and tourism” (EDC 2003). It is a major manufacturing center for transportation equipment and wood products. The region’s several seaports, international airport, and extensive network of railroad and trucking services make it one of the nation’s largest import-export centers. It is a regional finance and services center for the Pacific Northwest region. The high-tech and biotech industries have been a growing sector of the economy. In addition, the region is home to several military bases.

The manufacture of wood products has been the foundation of the regional economy for over 150 years. There are sawmills for lumber and shingles as well as manufacturing plants for doors, window frames, and wood veneers. Products are shipped around the world. Major regional employers include the Weyerhaeuser Company, Simpson Timber Company, and Plum Creek Timber Company. Changes in environmental regulations, world trade, and tariff factors, however, have hurt these sectors in recent years.

The region also has a substantial agricultural sector, despite increasing pressures from urban development. Key agricultural centers are located in Snohomish County and the southeastern portions of King and Pierce Counties and produce fruit and vegetable crops, along with dairy and poultry products.

Over the past half century, the regional economy has been heavily dependent upon the manufacturing sector, especially airplane manufacturing. The Boeing Company, one of the world’s largest airplane manufacturers, has established assembly plants and offices throughout the region. Major plants are located in

Everett, Renton, and Auburn. The Boeing Company has increasingly outsourced functions to independent contractors, which has stimulated the formation of many related aerospace businesses in the region. The aerospace industry has long been affected by cyclic ups and downs. Since the early 1990s, total regional employment in the aerospace sector has steadily declined from peak employment levels exceeding 100,000 workers. The increasing diversification of the regional economy helps to mitigate the cyclic impacts of changing employment levels at Boeing, although large-scale layoffs still have strong direct and indirect effects on the local economy. Other major transportation-related manufacturing firms in the region include Todd Shipyards and Paccar.

Over the past two decades, the computer and high-tech sector of the regional economy has grown considerably and has risen to national prominence. Employment peaked in the late 1990s, and the economic recession caused employment to decline in the early 2000s. The major employer is Microsoft, which now employs over 12,000 workers in the Puget Sound region. The rapid growth of Microsoft has also been the catalyst for the formation of many computer software and Internet companies, which together now employ tens of thousands of workers in the region. Employment in the biotechnology and medical technology sectors has also grown considerably over the past decade. The Fred Hutchinson Cancer Research Center, Amgen (previously Immunex), and other biotechnology firms are located at the south end of Lake Union and in downtown Seattle.

The region is the financial hub for Washington State and the Pacific Northwest. The state's banking, financial services, insurance firms, security and commodity brokers, holding companies, and investment firms are primarily headquartered in Seattle. Washington Mutual Bank and Safeco Insurance Company are both headquartered in Seattle. These industries experienced considerable upheaval as banking institutions merged in the 1990s.

The region has several major port facilities. The Port of Seattle is the fourth largest container shipping port in the nation and the largest in Washington. The Port of Tacoma is the second largest port in Washington. Recently, the volume of goods passing through the Port of Tacoma has rivaled the Port of Seattle, in part due to the inter-modal rail system that puts the Port of Tacoma on the cutting edge of container shipping technology. There is also a deep-water port in Everett, which was historically involved in the export of raw logs and locally manufactured wood products. In addition, the Port of Seattle's Seattle-Tacoma International Airport facilitates international shipping of large volumes of cargo goods. Together with the interconnected network of railroad and trucking services, these facilities make the region one of the nation's most important West Coast gateways for import-export trade, especially with Pacific Rim countries.

The regional economy is further strengthened by the presence of major military facilities, especially in Pierce and Snohomish Counties. The army and naval bases and supporting businesses directly and indirectly provide an estimated 11,000 jobs, including civilian jobs. Moreover, the military's presence is not limited to payrolls, as numerous contractors supply goods and services to these facilities.

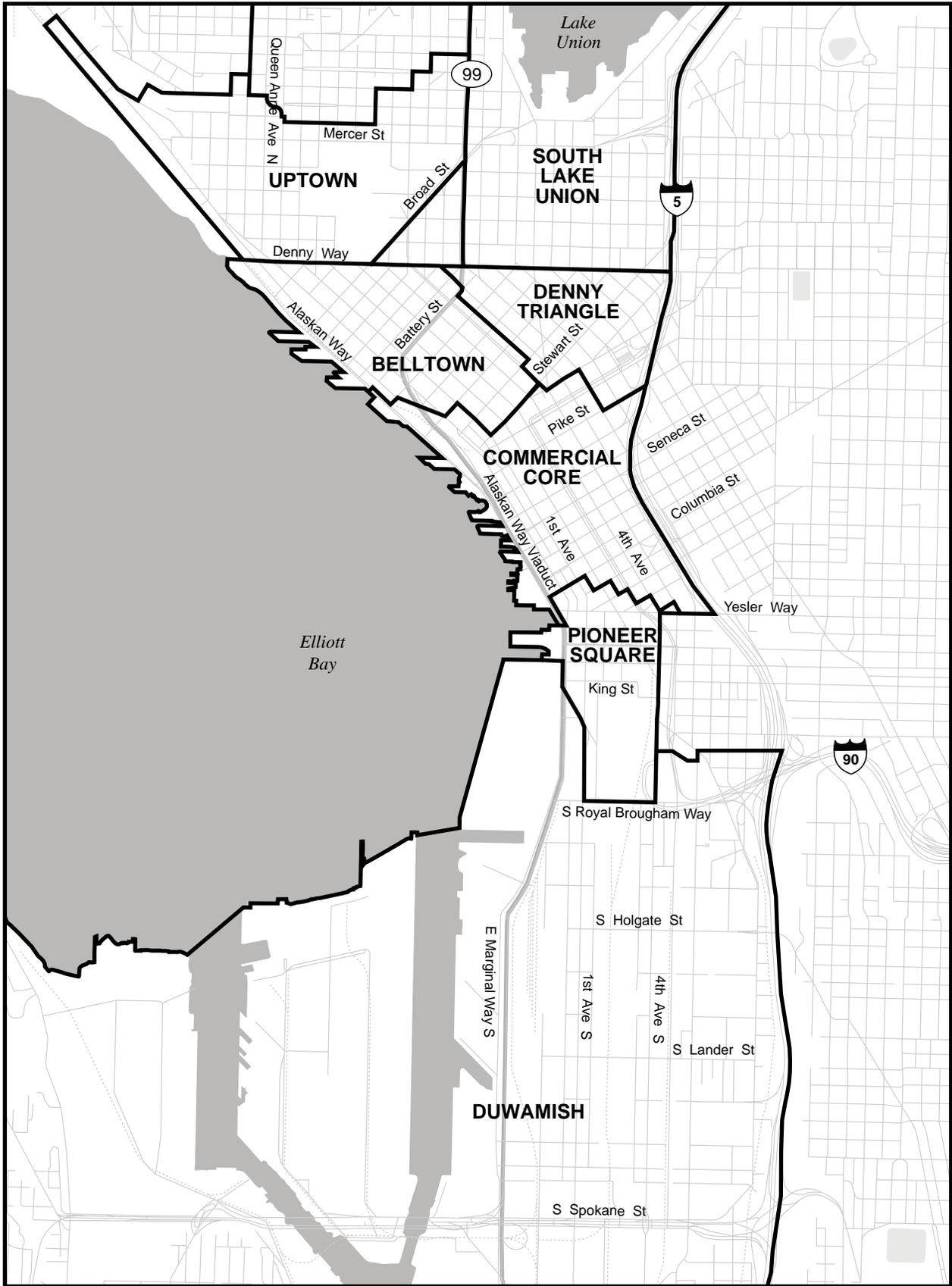
4.1.3 Regional Economic Stability

The Puget Sound region has provided and is anticipated to continue to provide a favorable business environment for existing and new businesses. Seattle is an important business and commercial center. Key factors that attract businesses include the highly skilled work force, well-recognized major educational institutions, manufacturing capabilities, access to both domestic and international markets, and a diverse regional economy. For residents, the Puget Sound offers a high quality of life, nationally recognized performing arts, professional sports teams, and scenic beauty. All of these factors contribute to defining conditions that are expected to bring continued employment and population growth to the region for the foreseeable future.

4.2 Project Study Area Overview

SR 99 is one of two major regional transportation facilities that connect downtown Seattle to both Everett in Snohomish County and Tacoma in Pierce County. Many of those who use the roadway live outside of the project area and either work in the downtown core, visit for shopping, or attend cultural performances. The roadway also services truck traffic between the Duwamish and Interbay industrial areas located to the south and north of downtown Seattle, respectively. People who live and work in the study area also use SR 99 for travel outside of the Seattle area.

The study area generally extends north along the city of Seattle's waterfront from approximately S. Spokane Street, south of the downtown area, to Myrtle Edwards Park located north of downtown. The project corridor also encompasses the Battery Street Tunnel and Aurora Avenue N. (north to Ward Street). The existing SR 99 project corridor traverses several neighborhood planning areas designated by the City of Seattle (Seattle 2000). Starting from the south and moving north, the study area includes the Duwamish, Pioneer Square, Commercial Core (including the Pike and Pine Street subareas), Belltown, Uptown, Denny Triangle, and South Lake Union neighborhoods (see Exhibit 4-4).



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Exhibit 4-4
Map of the Neighborhoods
in the Study Area

For analysis purposes, the project corridor is divided into four roadway segments – south, central, north waterfront, and north. Analysis of the seawall alternatives is discussed separately. The boundaries of these segments, however, do not coincide with the boundaries of any of the city-designated neighborhoods. A single neighborhood planning area may be encompassed by more than one of the corridor segments. The following sections provide more detailed descriptions of each of the roadway segments and the neighborhoods traversed by the project corridor. Additional information about land uses along the roadway segments is contained in Appendix G, Land Use and Shorelines Technical Memorandum.

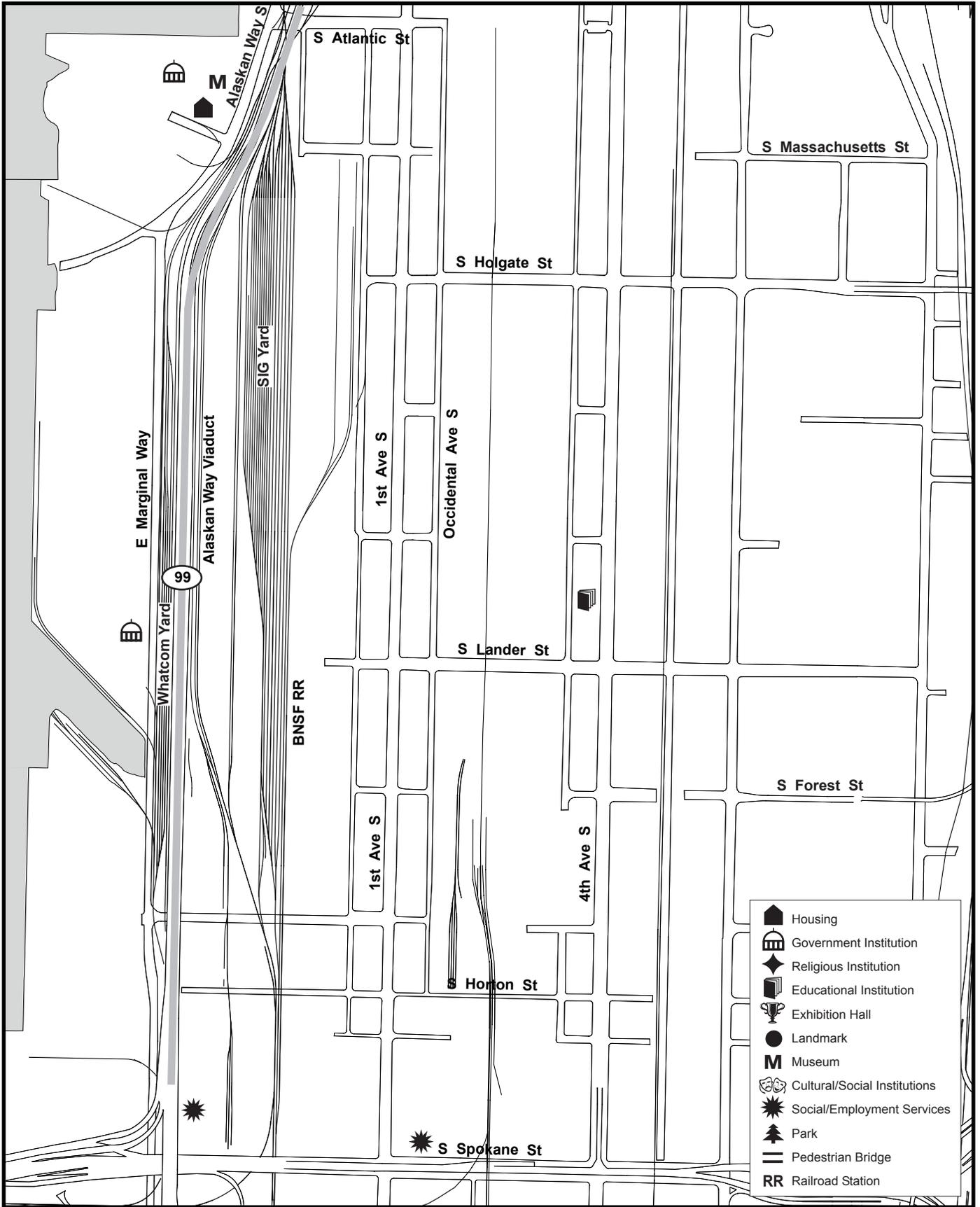
4.2.1 South – S. Spokane Street to S. King Street

The south segment primarily encompasses the very northern portion of the Duwamish neighborhood. The roadway currently separates major railroad yards south of downtown. Further north, Port of Seattle piers and terminals are west of the roadway and industrial and warehouse land uses are to the east.

Duwamish Neighborhood

The Duwamish area is generally south of S. Atlantic Street and has wholesale, warehouse, outdoor storage yard, trucking, industrial, and manufacturing businesses. Office buildings and retail businesses are more likely to be located in the northern portion, nearer to downtown Seattle. The city's central railroad tracks and spurs crisscross the area to create a discontinuous street network. Large barges and tugs move commerce up and down the Duwamish Waterway. The Port of Seattle's ocean-going container ship loading operations are located on Harbor Island.

Though the daytime work force population is very large, few residents live in this portion of the project corridor. Less than 1,000 persons are estimated to reside along this portion of the project corridor. This neighborhood is more likely to have Persons of Color, Hispanics/Latinos, family households, disabled persons, and people living at or below the poverty level compared to other neighborhoods in the study area. The area has only a few community facilities and social services (see Exhibit 4-5). Apartment buildings and old motels are scattered along the major arterial roads. Many of the streets lack curb, gutter, and sidewalks, which creates potential safety issues for pedestrians and persons waiting for buses. Gas stations and fast-food restaurants cater to employees of the area's commercial and industrial businesses. The major visitor attractions in this portion of the study area are the Seahawks Stadium, Safeco Field, and the Stadium Exhibition Hall.



Alaskan Way Viaduct 554-1585-025/06(0620) 2/04 (K)

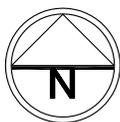
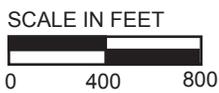


Exhibit 4-5
Map of Social Resources:
South Segment

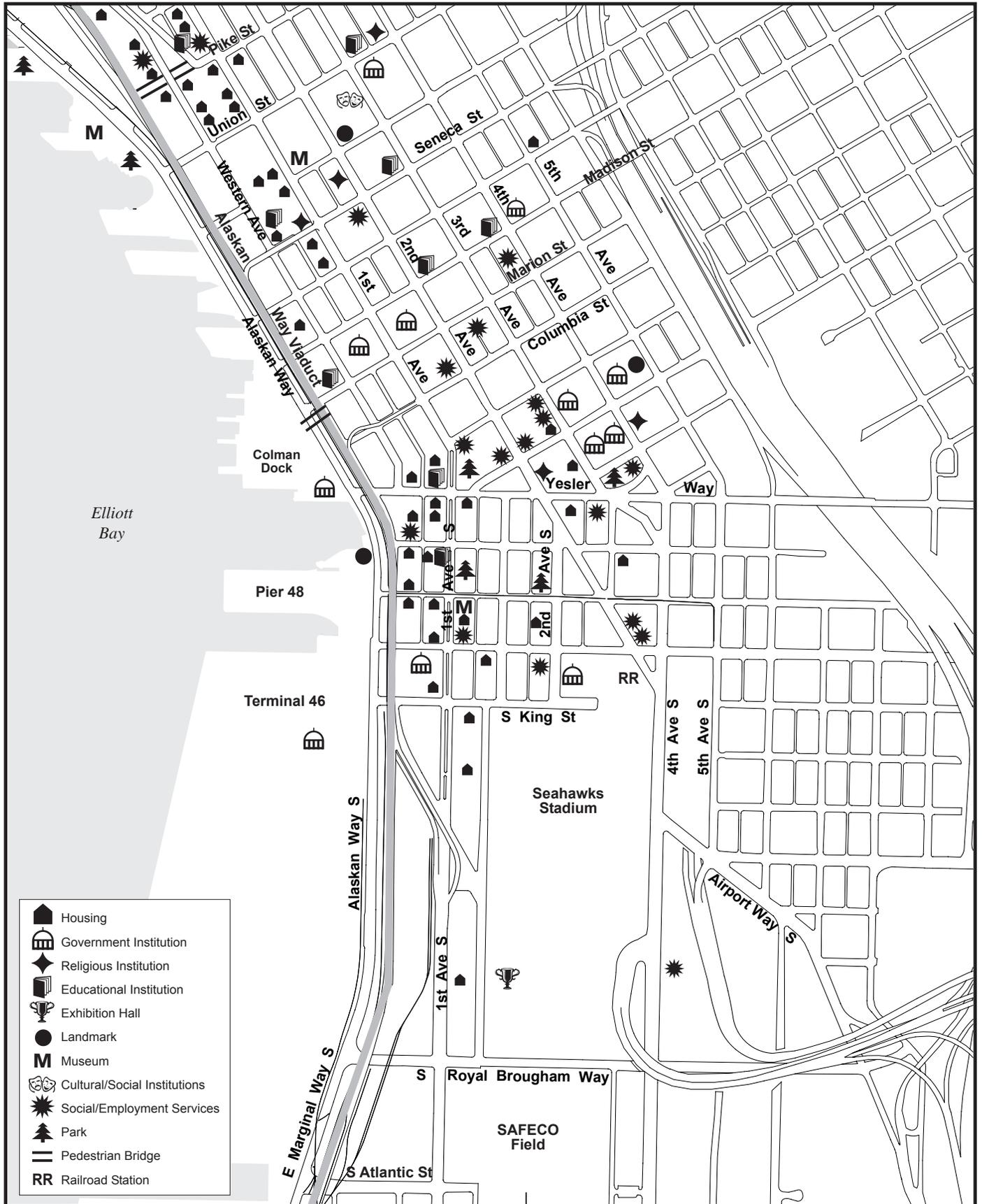
4.2.2 Central – S. King Street to the Battery Street Tunnel

The central segment encompasses the heart of Pioneer Square, the Commercial Core, and a portion of the Belltown neighborhoods. The urban development along this portion of the corridor is a dense mixture of land uses. It includes Seattle's business and financial centers, the government center, and the downtown retail district. Tens of thousands of workers commute from surrounding communities to downtown Seattle on a daily basis. People shop downtown, including the city's two historic districts (Pioneer Square and Pike Place Market) and attend events at major regional cultural institutions located downtown and at the Seattle Center. Many people both live and work in this portion of the project corridor. In total, an estimated 9,000 people live in this segment of the project corridor. Persons of color, Hispanic/Latinos, and persons living at or below the poverty level tend to live in the Pioneer Square area or in the vicinity of the Pike Place Market. Area residents also include some of the City's most affluent. Exhibit 4-6 shows social resources located in this segment.

Pioneer Square Neighborhood

The historic Pioneer Square neighborhood, formerly the city center of Seattle, is generally located between Yesler Way and S. Royal Brougham Way. It was established in the late 1800s. The boundaries of the Pioneer Square neighborhood also encompass the National Register historic district and the slightly larger City-designated historic district. The city blocks are relatively small and the streets are narrow. Smaller-scale two- and four-story brick buildings, many with unique architecture, and several large plazas, characterize the historic district.

Walking through the neighborhood, including the Seattle Underground Tour, is a popular attraction for visitors. The interiors of several old brick warehouse buildings have been remodeled into artists' lofts and office buildings. Neighborhood residents live in the many older apartment buildings, new condominium buildings, and a few emergency shelters for homeless men. Popular retail businesses, restaurants, and boutique shops line First Avenue S. (see Exhibit 4-6), landscaped with large sycamore trees planted in the street median. Several newer office buildings, including a new King County government office complex, have recently been built in the neighborhood. Seattle's main railroad station, King Street Station, is located in the neighborhood. The adjacent historic Union Station was restored and is now used as the Central Puget Sound Regional Transit Authority's headquarters. The new Safeco Field (professional baseball) and Seahawks Stadium (professional football) are also located in this neighborhood and are a regional attraction for thousands of sports fans.



Alaskan Way Viaduct 554-1585-025/06(0620) 2/04 (K)

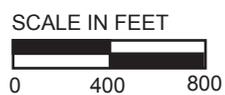


Exhibit 4-6
Map of Social Resources:
Central Segment

Commercial Core Neighborhood

The Commercial Core is Seattle's major downtown area and generally extends along the waterfront between Yesler Way and Pike Street. The neighborhood is set apart from adjacent neighborhoods by a change in the orientation of the street network to the north and south and is characterized by many high-rise office buildings. Tens of thousands of workers commute to the Commercial Core each day. The neighborhood includes the city's financial district and retail core. First class hotels, restaurants, museums, theatres, and the symphony hall are found here (see Exhibit 4-6). The Colman Dock Ferry Terminal and the Seattle Aquarium are located on the waterfront, along with many tourist shops and other visitor attractions. The Pike Place Market Historic District is located just up the hill from the waterfront and is a popular attraction. Subsidized housing and social service agencies are also clustered near the Pike Place Market. Government office buildings, including the Federal Reserve Bank of San Francisco, Federal Office Building, King County Administrative Center, and U.S. Court House, are found in this part of Seattle. In the past 10 to 15 years, a number of high-rise luxury condominiums have also been constructed in the city's Commercial Core.

Belltown Neighborhood

Belltown is located immediately north of the city's downtown area and generally extends from Stewart Street north to Denny Way. Characterized by mixed business, commercial, and residential land uses, this neighborhood is located between the waterfront and the downtown, and extends east to approximately Fifth Avenue. Several restaurants, the long-established Edgewater Hotel, Bell Street Conference Center, Odyssey Discovery Maritime Museum, and the Port of Seattle offices are located along the waterfront.

The neighborhood has undergone substantial redevelopment over the past 10 to 15 years. Expensive mid-rise condominiums have been constructed along the waterfront. High-rise condominiums and apartment buildings have also been built up the hill overlooking the waterfront. The neighborhood also retains many of the city's historic hotels and apartment buildings. Many of these older buildings have been converted into subsidized housing for low-income persons. The neighborhood continues to have a residential character with shade trees lining many streets. This area includes the vast majority of social service agencies located in the study area (see Exhibit 4-7). The shops, restaurants, coffee houses, and bars in the neighborhood cater to the diverse local clientele. Some smaller-scale office buildings are located in the neighborhood.

4.2.3 North Waterfront – Pike Street to Broad Street

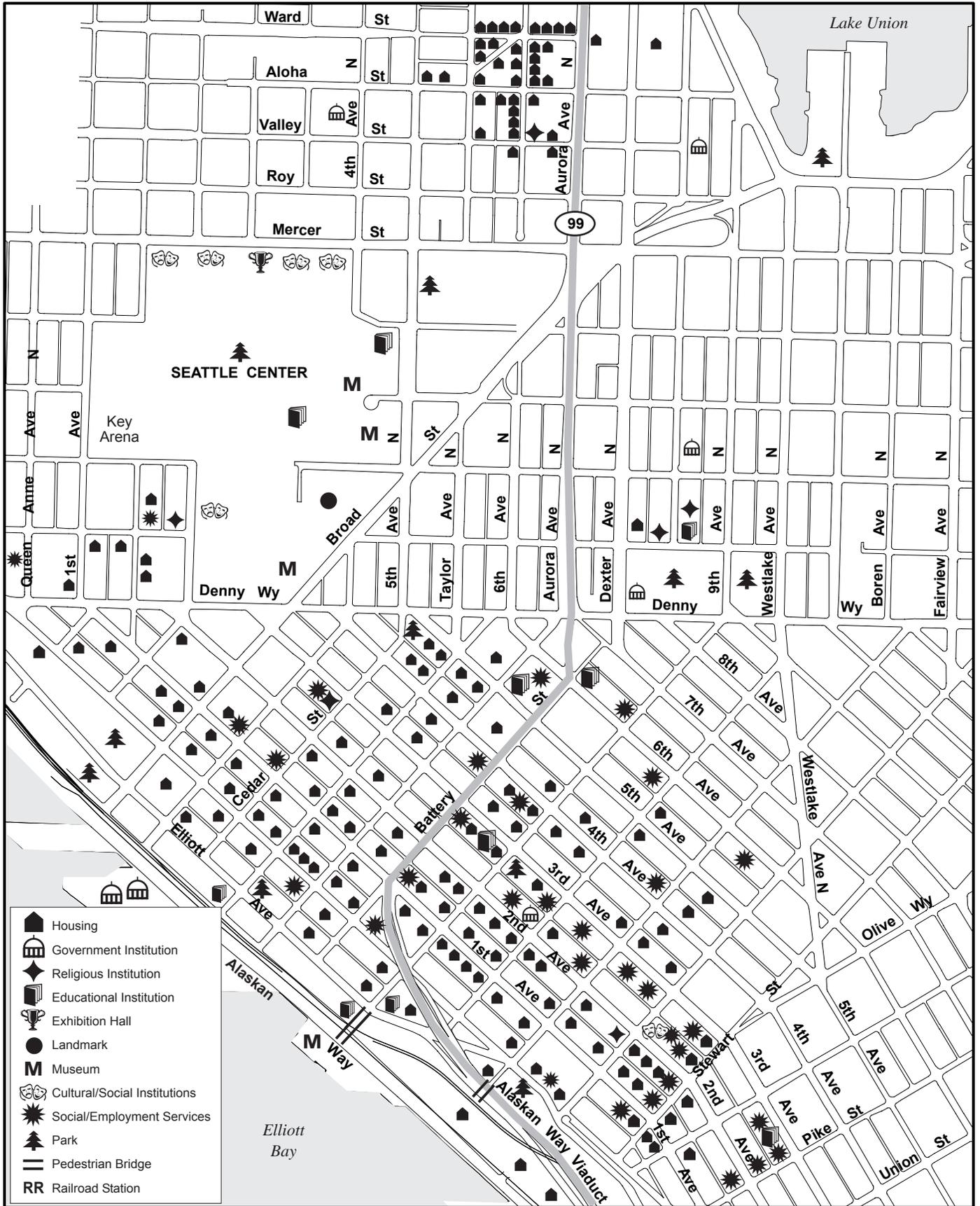
Portions of the Commercial Core, Belltown, and Uptown neighborhoods are in the north waterfront segment (see descriptions above). The area encompasses the several blocks immediately adjacent to the seawall. Major streets in this area are the Alaskan Way surface street, Elliott Avenue, Western Avenue, Post Alley, and First Avenue between Pike Street and Broad Street. This segment includes downtown office buildings, older apartment buildings, and new waterfront luxury condominiums and townhouses. In total, an estimated 1,200 residents live in this portion of the project corridor. This area includes much of the city's tourist-oriented waterfront, commercial tour boats, the Seattle Aquarium, Odyssey Maritime Discovery Center, restaurants, hotels, a conference center, the cruise line terminal, the Port of Seattle offices, and souvenir shops. Exhibits 4-6 and 4-7 show social resources located in the north waterfront segment.

4.2.4 North – Battery Street Tunnel to Ward Street

The north segment encompasses portions of the Belltown, Uptown, and Denny Triangle neighborhoods. Land uses above the Battery Street Tunnel are characterized by both old and new residential buildings, retail shops and restaurants, and low- to mid-rise office buildings. An estimated 5,400 persons live in this segment of the project corridor. A higher percentage of White persons and persons with higher incomes live in this area compared to other neighborhoods in the study area. Land uses to either side of Aurora Avenue N. (SR 99) are one- to two-story office buildings, gas stations, hotels, retail commercial, and light industrial and manufacturing. As Aurora Avenue N. was the original north-south highway through Seattle, many of these businesses continue to be oriented towards highway traffic. Light industrial buildings typify the land uses down the hill and east of Aurora Avenue N. Exhibit 4-7 shows social resources located in the north segment.

Uptown Neighborhood

The mixed-use Uptown neighborhood lies north of Belltown and generally extends from Denny Way north to Mercer Street and further north along Aurora Avenue N. The focal point of this neighborhood is the Seattle Center, the site of the 1962 World's Fair. Today, the Seattle Center is home to several theatres, the Marion Oliver McCaw Hall (opera and ballet), the Pacific Science Center, Key Arena (home of the Seattle Supersonics basketball team), the Seattle Children's Theatre, the Space Needle, Seattle Public Schools' Memorial Stadium (sports and special events stadium), and an amusement park. The Seattle Center receives about 10 million visitors annually (Seattle Center 2003).



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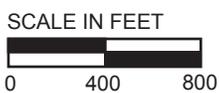


Exhibit 4-7
Map of Social Resources:
North Segment

Restaurants and shops serving the needs of residents and those attending local arts events are found on First Avenue N. and Queen Anne Avenue N. The surrounding area is characterized by two- to four-story office buildings and older apartment buildings. Single-family residences and small apartment buildings characterize the west side of Aurora Avenue N. on Valley, Aloha, and Ward Streets. Very few subsidized or special needs housing or social service agencies are located in this area (see Exhibit 4-7).

Denny Triangle Neighborhood

The Denny Triangle is north of the Commercial Core and east of Belltown. This neighborhood is a mixture of apartment, retail, commercial, and mid-rise office buildings. With its close proximity to the freeway, a number of the local streets carry traffic to or from highway on- and off-ramps. The neighborhood is in transition as downtown high-rise office development is expanding northwards into the neighborhood.

South Lake Union Neighborhood

The historically industrial South Lake Union neighborhood lies north of Denny Way and east of Aurora Avenue N. It is currently a mixture of commercial, wholesale, and light industrial uses. It is traversed by Mercer Street, which handles heavy traffic flows from Uptown and Seattle Center to the I-5 on-ramps. This major arterial separates land uses along the lakeshore and the southern portion of the neighborhood. Vacant or underused parcels and buildings are scattered around the neighborhood. Several old unused railroad spur lines crisscross the area. Many streets lack curb, gutter, and sidewalks. The lakefront is characterized by marinas, a maritime museum, South Lake Union Park (12 acres), boat building and repair facilities, and maritime materials and supply businesses.

Restaurants, hotels, and several biotech research offices have recently been built along the waterfront. The area currently has only a few apartment buildings and retail/commercial establishments to meet the needs of area residents. Proposed plans by the Vulcan Company, a major owner of property in the neighborhood, call for substantial residential, retail, and biotech business development. These plans indicate the neighborhood will experience major redevelopment in the coming 10 to 20 years. Very few social resources are located in this neighborhood (see Exhibit 4-7).

4.2.5 Seawall – S. King Street to Myrtle Edwards Park

The portion of the project corridor that will have rebuilt or reconstructed seawall overlaps with the waterfront portions of the central and north waterfront segments described above. The area encompasses several blocks

immediately adjacent to the waterfront. It includes historic retail and residential buildings in the Pioneer Square Historic District, downtown office buildings immediately east of the existing elevated viaduct structure, tourist-oriented shops and restaurants on the piers, special marine attractions, and both old and new residential buildings. Local residents, downtown workers, visitors, and others mingle along the waterfront sidewalks and pedestrian trails. Exhibits 4-6 and 4-7 shows social resources located in the seawall segment.

4.2.6 Study Area Summary

The project study area is comprised of four roadway segments and a separate analysis area for the proposed replacement of the seawall. The project corridor encompasses six very distinct neighborhoods in downtown Seattle. The study area for social resources includes (1) portions of the region's industrial and manufacturing center adjacent to the city's seaport; (2) the Pioneer Square and Pike Place Market historic districts; (3) the city's financial, government, retail, and cultural centers; (4) a redeveloped residential neighborhood; (5) a vibrant mixed-use community surrounding one of the city's major arts and entertainment centers; and (6) part of the city's old light industrial core south of Lake Union.

4.3 Population and Demographics

The population trends and demographic characteristics of the study area are both similar and very different from the population of the city of Seattle. The most comprehensive recent source of demographic information for the study area is information published by the U.S. Bureau of the Census. The following sections describe characteristics of the study area and compare them to those of the city. Characteristics described include total population, race and ethnicity, language, age, household status, income, disability, housing, and transit dependency. Summary statistics are shown below. Detailed statistics by census tract block group are contained in Attachment B.

4.3.1 Study Area Census Tract Block Groups

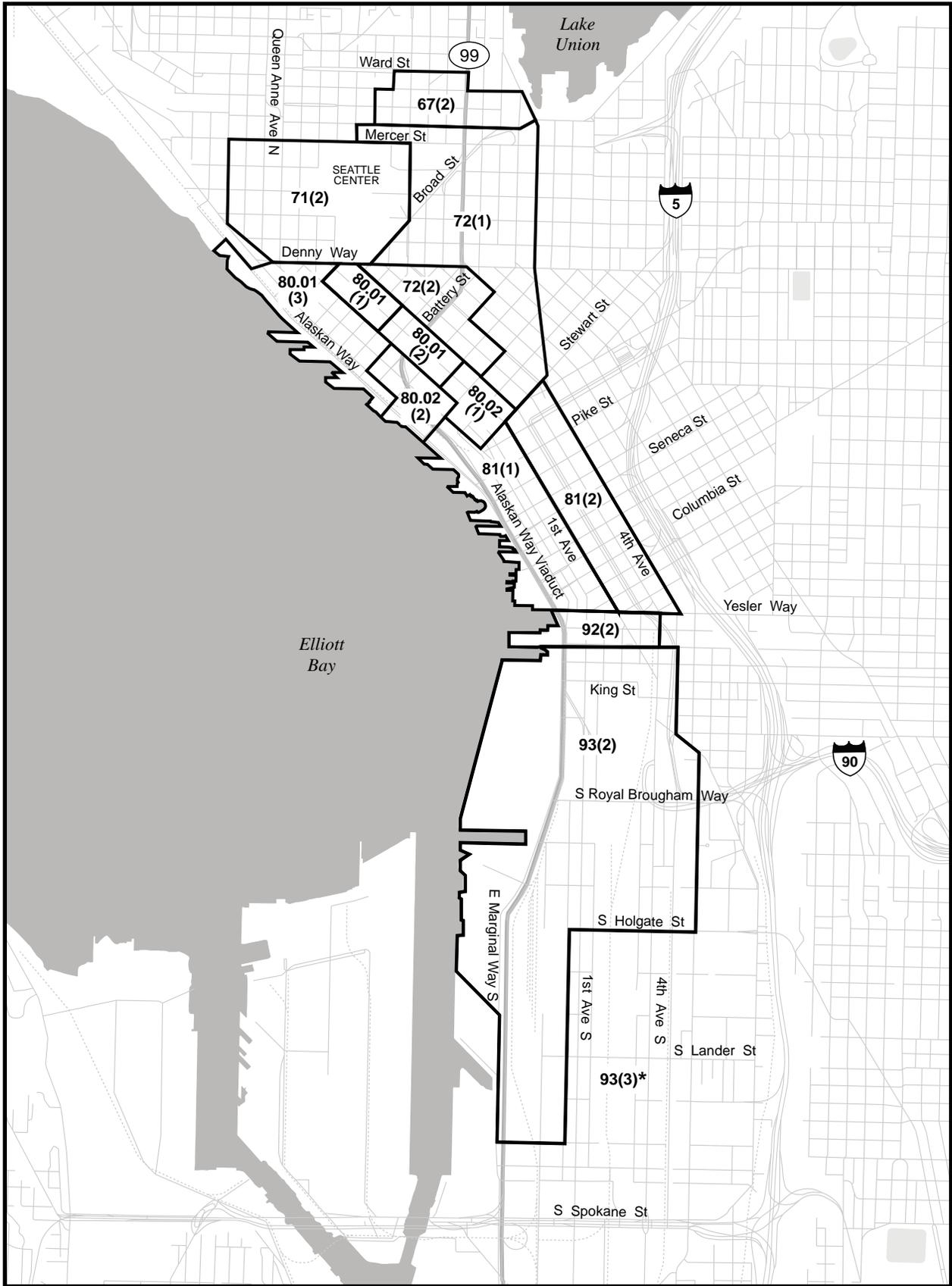
The study area is defined as approximately five blocks to either side of the project corridor and encompasses all or most of approximately 13 census tract block groups. Exhibit 4-8 is a list of these census tract block groups for 2000 and the nearly equivalent 1990 census tract block groups. (See Section 2.4 for an explanation of the differences.) Exhibit 4-9 is a map of the 2000 census tract block groups.

Exhibit 4-8. Census Tract Block Group Equivalencies for 1990 and 2000

Area	1990 Tract	1990 Block Group	2000 Tract	2000 Block Group
Project Study Area	67.98	2	67	2
	71	1	71	2
		2		
	72	1	72	1
		2		
		4		
	72	3	72	2
	80	1	80.01	1
				2
	80	2	80.02	1
				2
	80	3	80.01	3
	80.99	3		
	81	3	81	1
		4		
	81	1	81	2
		2		
	92	2	92	2
		3		
	93	8	93	2
93.99	8			

Note: Census Tract 80.99 Block Group 3 includes residents who lived on boats in Census Tract 80 Block Group 3. Census Tract 93.99 Block Group 8 includes residents who lived on boats in Census Tract 93 Block Group 8. In 2000, Census Tract 80 was divided into two census tracts, 80.01 and 80.02. As such, the sum of the data for 1990 Census Tracts 80 and 80.99 are comparable to the sum of the data for 2000 Census Tracts 80.01 and 80.02.

Source: U.S. Census (1990, 2000).



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 Source: U.S. Census 2000.

*Note: Census Tract 93 Block Group 3 was excluded as the study area covers less than 1/3 of total block group area.



93(3) Census Tract (Block Group)

Exhibit 4-9
Map of the Census Tracts
of the Study Area

4.3.2 Population, Race, and Ethnicity

The study area, though located in the densely developed downtown area, comprises only a small percent of the total population of Seattle. In 2000, the population of the study area was an estimated 15,839 (see Exhibit 4-10). This was less than 3 percent of the total population of the city. This reflects the industrial and commercial office character of much of the study area.

Exhibit 4-10. Race and Ethnic Characteristics, 1990 and 2000

Area	Total Pop	Race ¹					Ethnicity ²
		White	Black/ African Am	Am Ind & AK Native	Asian & Pacific Islander	Other	Hispanic or Latino
1990 Census							
Project Study Area	9,525	7,673 (81%)	1,008 (11%)	290 (3%)	376 (4%)	160 (2%)	937 (10%)
City of Seattle	516,259	388,858 (75%)	51,948 (10%)	7,326 (1%)	60,819 (12%)	7,308 (1%)	18,349 (4%)
2000 Census							
Project Study Area	15,839	11,701 (74%)	1,545 (10%)	377 (2%)	1,184 (7%)	1032 (7%)	1,200 (8%)
City of Seattle	563,374	394,889 (70%)	47,541 (8%)	5,659 (1%)	76,714 (14%)	38,571 (7%)	29,719 (5%)

Notes:

¹The definitions for racial groups used by the U.S. Census changed between 1990 and 2000. In 1990, the groups were (1) White, (2) Black, (3) American Indian, Eskimo, and Aleut, (4) Asian or Pacific Islander, and (5) Other. In 2000, the groups were (1) White, (2) Black/African American, (3) American Indian/Alaska Native, (4) Asian, (5) Native Hawaiian/Pacific Islander, (6) Other, and (7) Two or more races. For purposes of comparison in the table, groups have been combined. Percentages may not sum to 100 due to rounding.

²The category Hispanic or Latino is not a racial group but an ethnic identity, and persons may be of any race. The racial statistics for Hispanic or Latino people are included in the race categories in the previous columns. Source: U.S. Census (1990, 2000).

The population of the study area increased dramatically over the previous decade. In 1990, the population of the study area was only 9,525. Since 1990, more than 6,000 new residents have made the area their home. This is an estimated average annual increase of approximately 6 percent. In contrast, the population of Seattle increased an average of less than 1 percent per year. Section 4.5 below further describes the existing housing stock and recent residential development in the study area.

Generally speaking, the racial characteristics of the study area residents are similar to the population of the City of Seattle, though slightly less racially diverse (see Exhibit 4-10). In 1990, approximately 81 percent of the population residing in the project study area was White and 19 percent was Non-White. Black/African Americans and Asian/Pacific Islanders composed approximately 11 and 4 percent of the population, respectively. For comparison, the 1990 population of the city was approximately 75 percent White and 25 percent

Non-White. The Black/African Americans and the Asian/Pacific Islanders were the two largest racial groups and composed approximately 10 and 12 percent of the total population, respectively.

Like Seattle, the study area has become more racially diverse over the past decade. Between 1990 and 2000, the White percentage of the study area population decreased from 81 to 74 percent. This change is comparable to the city's White population decrease from 75 to 70 percent. The percentage of the population in the study area that was Black/African American did not change much between 1990 and 2000. The Asian/Pacific Islander population, however, increased from 4 to 7 percent. The proportion of the population included in the 'Other' category of racial groups also increased from 2 to 7 percent of the total population. The added racial group categories from which persons could select on the 2000 census form generally tended to show increased racial diversity because people were not asked to select only one racial group if they were of mixed heritage.

The proportion of the population in the study area that identified themselves as Hispanic or Latino (White and Non-White persons) in both 1990 and 2000 was higher than citywide characteristics. In 1990, an estimated 10 percent of the study area population and 4 percent of Seattle's population was Hispanic or Latino. These percentages changed only slightly in 2000 to 8 percent and 5 percent, respectively.

Another U.S. Census statistic that measures ethnic diversity is the primary language spoken in the home. A total of four general language categories were reported for census tract block groups in both 1990 and 2000. These included English only, Spanish, Asian and Pacific Islander, and Other languages. In addition, the U.S. Census assessed whether or not households were linguistically isolated from the community due to the lack of an adult person in the household who had a good command of the English language. In 1990, a total of 89 percent of the households in the study area spoke only English at home and only 2 percent of the households were linguistically isolated (see Exhibit 4-11). The statistics for Seattle were very similar, though a slightly larger percent of the population was linguistically isolated, and fewer spoke only English at home.

The percentage of households speaking other non-English languages in the home were nearly equal among the several language groups for the study area in both 1990 and 2000. The percent of households speaking Spanish in the study area was similar to Seattle, though slightly less than the percentage of the population that identified themselves as Hispanic or Latino (see Exhibit 4-11). The city also had a higher percentage of households where Other languages were spoken in the home, and a slightly higher percentage of the households were linguistically isolated compared to the study area.

Exhibit 4-11. Language Characteristics, 1990 and 2000

Area	Households Predicted	English Only	Spanish	Asian & Pacific Islander	Other Languages	Linguistically Isolated
1990 Census						
Project Study Area	6,104	5,403 (89%)	156 (3%)	221 (4%)	324 (5%)	140 (2%)
City of Seattle	236,908	199,280 (84%)	6,429 (3%)	16,985 (7%)	14,214 (6%)	9,110 (4%)
2000 Census						
Project Study Area	9,956	8,368 (84%)	338 (3%)	533 (5%)	717 (7%)	498 (5%)
City of Seattle	258,635	205,381 (79%)	11,636 (4%)	23,047 (9%)	18,571 (7%)	13,590 (5%)

Note: A linguistically isolated household is one in which no member 14 years or older speaks only English or speaks a non-English language and speaks English “very well.” These statistics are based on a sample survey, not the 100 percent census, therefore the number of households is predicted and not the actual number of households. Percentages may not sum to 100 due to excluded data.

Source: U.S. Census (1990, 2000).

4.3.3 Age Characteristics

The age characteristics of the study area are distinct from those of the city of Seattle. As shown in Exhibit 4-12, study area residents have a lower proportion of children than the rest of the city. In 1990, children under the age of 18 years of age composed only an estimated 3 percent of the total population of the study area compared to nearly 17 percent for Seattle. The demographic characteristics for children have changed little for either the study area or the city over the past decade. The proportion of adults 18 to 64 years of age, however, increased and the proportion for elderly persons decreased over the past decade for both areas. The study area, however, has had a slightly higher percentage of elderly residents compared to the city—approximately 19 percent versus 15 percent, respectively.

Exhibit 4-12. Age Characteristics, 1990 and 2000

Area	Total Population	0–4 Years	5–17 years	18–64 Years	65 Years and Older
1990 Census					
Project Study Area	9,525	90 (1%)	146 (2%)	7,522 (79%)	1,765 (19%)
City of Seattle	516,259	29,269 (6%)	55,661 (11%)	352,929 (68%)	78,400 (15%)
2000 Census					
Project Study Area	15,839	202 (1%)	296 (2%)	13,594 (86%)	1,745 (11%)
City of Seattle	563,374	26,215 (5%)	61,612 (11%)	407,740 (72%)	67,807 (12%)

Note: Percentages may not sum to 100 due to rounding.

Source: U.S. Census (1990, 2000).

4.3.4 Household Characteristics

Considering that the population of the study area has fewer children and a higher proportion of adults 16 to 64 years of age, it is logical that the household characteristics of the study area are different from the city of Seattle (see Exhibit 4-13). In 1990, the U.S. Census reported that approximately 78 percent of the households in the study area were one-person households and only 2 percent of the households were families with children. In contrast, Seattle households were approximately 40 percent one-person households and 20 percent families with children, respectively. Using the 2000 census statistics for the study area, the average number of persons per household is approximately 1.58, compared to 2.18 for Seattle. In the study area, households with elderly members reduced by nearly 50 percent between 1990 and 2000. Today, the proportion of elderly persons in the study area is less than the proportion for the city.

Exhibit 4-13. Household Characteristics, 1990 and 2000

Area	Households	One-Person Households	Family Households	Families with Children	Single Parent Families with Children	Elderly Households
1990 Census						
Project Study Area	6,024	4,673 (78%)	846 (14%)	119 (2%)	61 (1%)	1,535 (25%)
City of Seattle	236,702	94,179 (40%)	112,969 (48%)	47,629 (20%)	3,630 (2%)	52,931 (22%)
2000 Census						
Project Study Area	10,028	7,391 (74%)	1,589 (16%)	260 (3%)	142 (1%)	1,286 (13%)
City of Seattle	258,499	105,542 (41%)	113,400 (44%)	50,083 (19%)	16,366 (6%)	45,017 (17%)

Note: Families are households with more than one person related by blood or marriage or adoption. Families with children are households with one or more child less than 18 years of age residing in the home. Elderly households have at least one member 65 years or older.
Source: U.S. Census (1990, 2000).

4.3.5 Income Characteristics

Income statistics for the study area show another aspect of the diversity of residents in the project study area. Generally, the residents are less well off than residents of the city (see Exhibit 4-14). Over a decade ago, the median income of households in the study area was considerably less than the median income of households in Seattle. In 1990 and 2000, the median income of the study area and city increased from \$16,453 to \$35,472 and \$29,353 to \$45,736, respectively. The rate of increase of the median income of households in the study area was faster over the decade and reflects a change to higher income households in the study area. The per capita income of the project study area exceeds the per capita income of households in Seattle.

Exhibit 4-14. Income Characteristics, 1990 and 2000

Area	Households	Median Household Income	Per Capita Income	Households With Public Assistance	Population At or Below the Poverty Level
1990 Census					
Project Study Area	6,024	\$16,453	\$19,926	792 (13%)	2,574 (29%)
City of Seattle	236,702	\$29,353	\$18,308	15,051 (6%)	61,681 (12%)
2000 Census					
Project Study Area	10,028	\$35,472	\$41,646	418 (4%)	3,781 (25%)
City of Seattle	258,499	\$45,736	\$30,306	7,638 (3%)	64,068 (12%)

Note: Income statistics for the 1990 census are for year 1989 and statistics for the 2000 census are for year 1999.
Source: U.S. Census (1990, 2000).

The increased median household income in the project study area does not mean that there are not substantial numbers of low-income persons residing in the area. In 1990, an estimated 13 percent of households in the study area received public assistance and 29 percent of the population lived at or below the poverty level. These levels were more than double the 6 percent and 12 percent, respectively, for Seattle households and residents. Over the decade, there was a clear trend for both the study area and the city to have a smaller proportion of households reliant upon public assistance. However, the percent of the population living at or below the poverty level has remained approximately 25 to 29 percent compared to approximately 12 percent for the city.

It appears that residents in the study area include two distinct groups: low-income persons and high-income individuals. Median household incomes of the study area have increased more substantially than for the city as a whole, which could imply a growing number of middle-income households. However, this does not appear to be the case due to conflicting higher per capita income and high proportions of the population living at or below the poverty level.

4.3.6 Disabled Persons

The 2000 U.S. Census estimated the number of persons with disabilities residing in the study area based on responses to questions on the census short form. The U.S. Census short form asked respondents if they had any of the following long-term conditions: (1) blindness, deafness, or a severe vision or hearing impairment (sensory disability) or (2) a condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying (physical disability). In addition, respondents were asked if they had a physical, mental, or emotional condition that made it difficult to perform certain activities, including (a) learning, remembering, or concentrating (mental disability); (b) dressing, bathing, or getting around

inside the home (self-care disability); (c) going outside the home alone to shop or visit a doctor's office (go-outside-the-home disability); and (d) working at a job or business (employment disability).

Respondents could report more than one type of disability, and the disabilities could cause limitations to one or more activities. Not all limitations, however, can be assumed to affect the mobility of persons. Moreover, children 5 to 15 years of age generally have family members who assist them. As such, it is not appropriate to report all persons with all disabilities as representative of persons with mobility limitations.

The best statistic to describe disabled persons with mobility limitations is the number of persons 16 years and older who have a disability that affects their ability to go outside of the home alone. Exhibit 4-15 presents these statistics for the study area and the city of Seattle. In 2000, an estimated 1,363 persons, or approximately 9 percent of the study area population, had mobility limitations. This proportion is considerably higher than for the city, which had an estimated 6 percent of the population with a mobility disability.

Exhibit 4-15. Disabled Persons With Mobility Limitations, 2000

Area	Population	Population 16 Years or Older With Disability	Percent of Total Population
Project Study Area	15,839	1,363	9%
City of Seattle	563,374	32,051	6%

Source: U.S. Census (2000).

4.3.7 Transit Dependency

The 2000 U.S. Census reported means of transportation available to households. Respondents were allowed to report the number of vehicles available for personal use (as opposed to vehicles only available for business or work that might be kept at home). For the study area, a large proportion of households had no vehicle available for personal use (see Exhibit 4-16). For the project study area, approximately 49 percent of the households in 2000 had no private vehicles, whereas only an estimated 16 percent of households in Seattle did not have use of a vehicle for personal use. This proportion of the study area population that is transit-dependent is more than three times the citywide statistic. Without a vehicle available, these residents must rely upon public transit (trains, monorail, buses, and taxis) for most of their transportation needs.

Exhibit 4-16. Transit-dependent Households, 2000

Area	Dwellings	Occupied	No Vehicle Available	Percent
Project Study Area	11,542	10,028	4,925	49%
City of Seattle	270,524	258,499	42,180	16%

Source: U.S. Census (2000).

4.4 Housing

This section describes housing in the study area. General housing characteristics are described, as well as subsidized and special-needs housing.

4.4.1 General Characteristics

Over the past decade, substantial residential development has occurred in the study area. This development has considerably diversified the type of housing available in downtown neighborhoods. Between 1990 and 2000, the total number of dwellings in the study area increased dramatically from approximately 6,024 to 11,542 (see Exhibit 4-17). This is a 92 percent increase. Downtown Seattle has many new high-rise residential buildings, especially in the Belltown and Uptown neighborhoods. The higher vacancy rates in 2000 in part reflected the excess supply of new residential units in the area. Compared to Seattle, a higher percentage of study area residents rent rather than own their dwellings. This would generally be expected due to the high cost of real estate in the downtown area and lower median income of households.

Exhibit 4-17. Housing Characteristics, 1990 and 2000

Area	Total Dwellings	Vacant	Occupied	Own	Rent	Other Non-Institutional Group
1990 Census						
Project Study Area	6,024	685 (10%)	6,024 (90%)	812 (13%)	5,212 (87%)	1,829
City of Seattle	249,032	12,330 (5%)	236,702 (95%)	115,709 (49%)	120,993 (51%)	5,384
2000 Census						
Project Study Area	11,542	1,514 (13%)	10,028 (87%)	2,179 (22%)	7,849 (78%)	2,282
City of Seattle	270,524	12,025 (4%)	258,499 (96%)	125,165 (48%)	133,334 (52%)	8,921

Note: Other non-institutional group housing includes college dorms, military quarters, and other non-institutional group quarters such as emergency shelters.

Source: U.S. Census (1990, 2000).

One of the changes in housing in the study area over the past decade has been the near doubling of homeownership. Homeownership rates, however, still lag substantially behind those for the city. For the study area, homeownership increased from 13 to 22 percent. This occurred during a time when homeownership in Seattle decreased from 49 to 48 percent. This is in part because much of the new housing in the Belltown, Uptown, and Commercial Core neighborhoods has been condominiums, which generally cost less than the single-family residences typical of most of Seattle's

residential neighborhoods. However, some condominium market prices in downtown Seattle are very high, especially for those with views of the downtown cityscape, Puget Sound, and mountains.

Despite the dramatic increase in the number of housing units available in the study area, there has been an increase in persons living in non-institutional group housing, including emergency shelters. Over the past decade, the U.S. Census reported an approximate 25 percent increase in this population in the project study area. Though the rate of increase of persons living in non-institutional group housing was substantially lower than for all of Seattle, the study area comprises approximately one-quarter of this population. This is disproportionate considering the study area population is less than 3 percent of the total population of the city.

4.4.2 Subsidized and Special Needs Housing

The study area includes much of Seattle’s downtown subsidized and special needs housing. Special needs housing includes low-cost and low-income housing, senior housing, transitional and long-term residential services, emergency temporary housing, and shelters. Exhibit 4-18 is a list of subsidized rental housing within approximately five blocks of the proposed project corridor. In total, there are approximately 2,605 subsidized units in the project study area. Exhibit 4-19 is a list of special needs housing within five blocks of the project study area. The special needs housing serves the needs of battered women and their children, persons with developmental disabilities and mental health issues, and the homeless and transient persons. The Archdiocesan Housing Authority and the Plymouth Housing Group, two large non-profit housing agencies, and the Seattle Housing Authority operate many of these facilities. The City of Seattle, other government agencies, and non-profit organizations also operate social services in the vicinity for residents of these special needs housing (see Section 4.8 below).

Exhibit 4-18. Subsidized Housing in the Study Area

Subsidized Housing	Units
Apex Belltown Co-op	21
Bayview	28
Bell Tower	120
Bremer	50
Cedars I	29
Cedars II	31
Donald	14
Dorothy Day House	43
Elliott Hotel	39

Exhibit 4-18. Subsidized Housing in the Study Area (continued)

Subsidized Housing	Units
Ellis Court	58
Frye Apartments	234
Gatewood Hotel	96
Glen Hotel	38
Guiry/Schillstad	28
Haddon Hall (new)	66
Heritage House	62
John Carney	26
Josephinum	222
Kasota	49
LaSalle Cliff House	40
Lewiston	53
Lexington/Concord Apartments	59
Livingston Baker	96
Market House	51
New Pacific	42
Oregon Hotel	83
Post Alley Court	59
Ross Manor	100
Sanitary Market	22
Scargo Hotel	50
Security House	107
St. Regis Hotel	80
Stewart House	87
Sunset House	82
Vincent House	61
Vine Court	54
YWCA Opportunity House (new)	125
YWCA Women's Residence	100
TOTAL	2,605

Sources: City of Seattle (2003); Crisis Clinic (2002, 2003).

Exhibit 4-19. Special Needs Housing in the Study Area

Special Needs Housing
Transitional Housing and Residential Services
AHA-Rose of Lima House
AHA-Sacred Heart Shelter
AHA-Westlake Hotel
Second Chance – Reynolds Work Release Program
Valley House
Emergency Housing and Homeless Facilities
AHA-Noel House
AHA-St. Martin de Porres Shelter

Exhibit 4-19. Special Needs Housing in the Study Area (continued)

Special Needs Housing
Bread of Life Mission
Catholic Community Services -Denny Place Youth Shelter
Compass Center
Compass Center (new)
Compass Center – Hammond House
Downtown Emergency Service Center – Lyon Building
Downtown Emergency Service Center – Morrison Hotel
Downtown Emergency Service Center – Union Hotel

Notes: AHA -Archdiocesan Housing Authority; SHA -Seattle Housing Authority.
Source: Crisis Clinic (2002, 2003).

4.5 Community Facilities

This section describes community facilities located in the study area. These facilities include community centers and educational facilities. Religious, cultural, and social institutions are described separately in other sections of this document.

4.5.1 Community Centers

Seattle has a number of community centers, performing arts centers, and late-night recreational program centers. There are no such community facilities, however, located in the study area. The Yesler Community Center is the closest, but it is located over eight blocks away from the project corridor. The current location of this facility is temporary, however, as funding for a new community center was recently approved. At this time, the location, facilities, and programs for the new facility have yet to be decided.

4.5.2 Educational Facilities

Though there are only a few public educational facilities located in the study area, there are numerous childcare facilities, private academic schools, colleges, and universities, as well as professional and technical training schools. Exhibit 4-20 lists the names of these institutions. For additional information, please see Appendix O, Public Services and Utilities Technical Memorandum. The following is a brief summary of educational facilities in the study area.

The Seattle School District has one facility located in the downtown area. The Center School is within the Center House Building in the Seattle Center. The school is a specialized, arts-oriented high school for grades 9 through 12. In June 2003, a total of 220 students were enrolled at the school.

Also located at the Seattle Center is Seattle Public Schools' Memorial Field. This is a large sports stadium located on the east side of the Seattle Center that

is accessed from Fifth Avenue N., just north of Broad Street. This field is used for citywide high school sport team events, such as football and soccer, as well as special events such as music concerts.

In addition, there is a special program sponsored by the Seattle School District that is located in the study area. The Youth Education Program is located in the Alaska Building. This program serves approximately 90 students.

In downtown Seattle, there are a number of private childcare facilities. Of particular interest are childcare facilities that serve low-income residents of the study area. No daycare facilities operate as a social service agency or non-profit organization solely for low-income or homeless families. Rather, facilities are licensed by the state and as a licensed facility can choose to accept government subsidy payments from families. In Washington, the childcare subsidies include the federally funded Head Start Program, the state-funded Early Childhood Education and Assistance Program (ECEAP), and other special programs offered by agencies such as Child Protective Services, Child Welfare Services, and the Division of Vocational Rehabilitation. The Washington State Department of Social and Health Services (DSHS) administers these programs. The City of Seattle also has a separate program for city residents who are not eligible for the DSHS -administered programs. In the project study area, there are a total of six childcare facilities that provide services to low-income families (see Exhibit 4-20). These facilities together provide services for a total of 317 children between the ages of 1 month and 6 years of age. Several of the childcare facilities are located close to the project corridor.

Exhibit 4-20. Educational Facilities in the Study Area

Educational Facilities
Child Care Centers and Family Child Care (only those accepting government subsidies)
Beginnings II
Bright Water School
Little Eagles Childcare Center
Paideia Academy
Pike Market Child Care Center
YWCA Infant/Toddler Center
Seattle School District
The Center School
Memorial Field
John Stanford Center for Educational Excellence – School to Work Program/Career Center Services
GED Instruction
Educational Clinics, Inc.
Washington State Employment Security-Worksource
Colleges or Universities
Antioch University

Exhibit 4-20. Educational Facilities in the Study Area (continued)

Educational Facilities
Professional/Technical Schools
Academy of Languages Translation & Interpretation Services
American School of International Training
Floral Design Institute
Pacific Maritime Institute
The Art Institute of Seattle (North Campus)
The Art Institute of Seattle (South Campus)
The Pottery School
Washington Academy of Languages

In addition, there are a number of private secondary education and professional training institutions located in the study area. Exhibit 4-20 lists the names of these institutions. Antioch University enrolls approximately 1,000 students and offers both undergraduate bachelors of arts and graduate degrees in education, psychology, and several other programs. The Pacific Maritime Institute is associated with the Maritime Institute of Technology and Graduate Studies in Baltimore, Maryland. The Institute offers a series of professional maritime training programs. The Art Institute of Seattle enrolls approximately 2,700 students and offers nationally accredited vocational degree programs in visual arts and photography; culinary skills; and fashion, industrial, interior, and computer design.

4.6 Religious Institutions and Cemeteries

There are a total of 12 religious institutions located in the project study area. For the purposes of this study, religious institutions are defined as places of worship, meditation, or gathering places for members. They include six Christian churches, one Jewish synagogue, one Christian Science reading room, and other institutions (see Exhibit 4-21). These institutions are dispersed across the project area, though all are located north of Yesler Way. A number are located either among or within office high-rises in the Commercial Core neighborhood. Others are located in the more residential areas of Uptown and Belltown. Still other religious institutions, including the very large First United Methodist Church and the Plymouth Congregational Church, are located in downtown Seattle, but are outside of the study area. Members of the religious institutions may live in nearby residential areas or may live quite distant from the place of worship or gathering. There are no cemeteries either associated with these religious institutions or separately located in the study area.

Exhibit 4-21. Religious Institutions in the Study Area

Religious Institutions
Anchorpointe Seventh-Day Adventist
Bethel Temple
Chinese Temple & Observatory
Christian Science Reading Room
Church of Christ Scientist
Church of Scientology
Congregation Elitz
Denny Park Lutheran Church
Emmanuel Road Church
Horizon Church
Sacred Heart Church
Seattle Unity Church

4.7 Social and Employment Services

There are many public and non-profit social service providers located within the study area. These social service organizations provide hot meals, food bank services, drop-in hygiene facilities, clothing, employment and mental health counseling, and legal services, as well as referrals for other social services and employment (see Exhibit 4-22). Because many of the providers offer a number of services at one location, it is difficult to place individual providers into a single category. Many of these services focus on serving low-income and homeless persons residing in the study area.

Exhibit 4-22. Social and Employment Service Providers in the Study Area

Social Services
AARP – Senior Community Service Employment Program
AHA – Lazarus Center
AHA – Matt Talbot New Hope Recovery Center
AHA – Women’s Referral Center
AHA – Women’s Wellness Center
Archdiocese of Seattle – Catholic Seamen’s Club
Boomtown Cafe
CASA Latina
Catholic Community Services – Working Zone
Chief Seattle Club – Drop-In Center
Day Workers’ Center
DSHS Halfway House (proposed)
Downtown Emergency Service Center
Downtown Emergency Service Center – Clinical Services
Downtown Emergency Service Center – Mental Health Services
Fare Start Job Training
Fare Start at Antioch University
Family Services of King County – Baby Boutique

**Exhibit 4-22. Social and Employment Service Providers in the Study Area
(continued)**

Social Services
Family Services of King County – Downtown Seattle Main Office
Family Services of King County – Pioneer Square Office
First Avenue Service Center
International Longshoremen’s and Warehousemen’s Union – Local 19
International Rescue Committee
Job Corps – Deljen
King County Dept. of Community and Human Services – Veterans Program
King County Dept. of Community and Human Services – Work Training Program
King County Labor Agency – AFL-CIO
Millionaire Club Charity
New Horizons Ministries
Northwest Justice Project
Office of Port Jobs – Apprenticeship Opportunities Partnership
Operation Sack Lunch at City Hall Park
Pike Market Senior Center – Downtown Food Bank
Pike Market Senior Center – Senior Center
Pioneer Human Services – Hygiene Center
Salvation Army – Adult Rehabilitation Center
Salvation Army – Northwest Divisional Headquarters – Services to Aging
Salvation Army – Service Extension Dept.
Seattle/King County Public Health – Refugee Health Program
Seattle/King County Public Health – Downtown Clinic
Seattle/King County Public Health – Downtown Needle Exchange Site
Seattle/King County Public Health – Pike Place Market Clinic
Seattle Donated Dental Services
Senior Services of Seattle/King County
SHARE – WHEEL
Society of St. Vincent de Paul – Hot Meals Program
Street Outreach Services
The Giving Tree Workshop
Washington Adult Day Services Association
Washington Department of Corrections, Division of Community Corrections – Intervention Services
Washington Department of Corrections, Division of Community Corrections – Offenders Rehabilitation Services
Washington State Dental Association Outreach Program
Washington State Employment Security (Belltown Office)
Washington Works
YMCA – Family Services and Mental Health Program, Independent Living Program, Young Adults in Transition
YWCA – Angeline’s Women’s Day Refuge

Note: AHA – Archdiocesan Housing Authority
Sources: Crisis Clinic (2002, 2003).

As evident in the names of the social services, there are many types of social services located in the study area. They offer a wide variety of services and

are supported by a number of different types of public, private, and non-profit organizations. Some social services provide only one type of service and others provide a variety of services under the umbrella of a single organization. Interviews with some of the social service providers in the study area revealed that some providers, especially the referral service providers, typically work closely with other downtown social service providers. Coordination may include the types of services provided, referrals, and even transportation from one service provider to another (Goetchius 2002). As such, the many social service agencies and organizations located in the study area form a network of social services that support the daily lives of many downtown residents.

4.8 Cultural and Social Institutions

There are many cultural and social institutions located in the Seattle downtown area in close proximity of the project corridor. These include exhibition centers, community landmarks, museums, performing arts institutions, and stadiums. They attract residents from the Puget Sound region as well as business visitors, tourists, and others. Hundreds to tens of thousands of people may attend individual events at the many downtown cultural or social institutions. Events occur during daytime and evening hours on weekdays, as well as on Saturdays and Sundays. Individual events may last several hours or occur over a period of several days. Several museums located in close proximity to the project corridor are open daily, and exhibits change on a periodic basis. Exhibit 4-23 is a list of the cultural and social institutions located within several blocks of the project corridor.

Exhibit 4-23. Project Area Cultural and Social Institutions in the Study Area

Institution
Exhibition Centers
Bell Harbor Conference Center (Pier 67/68)
Exhibition Hall
Stadium Exhibition Center
Landmarks
Garden of Remembrance (veterans memorial)
Memorial Plaza
Occidental Square
Pioneer Place
Seattle Center (Site of 1962 World's Fair)
Seattle Center Monorail (Fifth Avenue from Broad Street to Pine Street)
Space Needle (Seattle Center)
Washington State Ferries (Pier 52)
Museums
The Center Children's Museum
Coast Guard Museum of the Northwest (Pier 36)
Experience Music Project

**Exhibit 4-23. Project Area Cultural and Social Institutions in the Study Area
(continued)**

Institution
Klondike Gold Rush National Historic Park
The Odyssey Maritime Discovery Center (Pier 66)
Pacific Science Center
Seattle Art Museum
Seattle Aquarium (Pier 59)
Performing Arts
Seattle Repertory Theatre
Benaroya Hall (Symphony)
Intiman Playhouse
Marion Oliver McCaw Hall (Ballet & Opera)
Mercer Arts Arena
Moore Theatre
Seattle Children's Theatre
Professional Sports Facilities
Key Arena (Basketball)
Safeco Field (Baseball)
Seahawks Stadium (Football)
Seattle Festivals and Special Events (select list)
St. Patrick's Day Dash (March charity run from Seattle Center to Seahawks Stadium via Alaskan Way Viaduct)
Seattle International Children's Festival (May at Seattle Center)
Northwest Folklife Festival (Memorial Day weekend at Seattle Center)
Bite of Seattle (July at Seattle Center)
Seafair Torchlight Run and Parade (early August charity run on Fourth Avenue)
Bumbershoot (Labor Day weekend at Seattle Center)
Susan B. Komen Race for the Cure (September charity run from the Seahawks Stadium along Alaskan Way Viaduct back to Seahawks Stadium)

In general, there are several concentrations of cultural and social institutions in the study area. One large concentration is located in the southern portion of the study area. This is the historic center of Seattle. Here is the site of Klondike Gold Rush National Historic Park, the nation's smallest national park, which celebrates the early days of Seattle. Occidental Square is the focal point of first Thursday of the month Art Walks among area art galleries. The area also has other historic landmarks, museums, and two large professional sports team stadiums (Seahawks Stadium and Safeco Field) that attract local residents and visitors alike.

Several other cultural and social institutions are found in the Commercial Core. The Odyssey Maritime Discovery Center and Seattle Aquarium are located along the waterfront with the Bell Street Pier 66 conference center. Further up the hill, the Seattle Art Museum, Garden of Remembrance veterans' memorial, and Benaroya Hall are clustered near Second Avenue and Union Street.

The largest concentration, however, comprises the many auditoriums, theatres, stadiums, arts, and entertainment facilities located at the Seattle Center near the intersection of Mercer Street and Fifth Avenue N. Seattle Center is also the site for regional annual arts and entertainment events. The Seattle Folklife Festival is held over Memorial Day weekend, the Bite of Seattle is held over a weekend in July, and Bumbershoot takes place over Labor Day weekend. In addition, the Seattle Center hosts community trade and business events throughout the year.

4.9 Government Institutions and National Defense Installations

Many government agency offices are located within the study area or within close proximity (see Exhibit 4-24). They represent city, county, state, and federal administrative offices, libraries, public safety offices, and detention centers, as well as judicial offices and courts. Most are located in the Commercial Core. They are in high-rise buildings entirely occupied by government agencies and in office buildings scattered among businesses. In addition, there are a number of Port of Seattle properties along the waterfront. These Port properties are discussed in more detail in Appendix P, Economics Technical Memorandum.

Most of the government office buildings are located in the central and southern area of the Commercial Core. Two office buildings entirely occupied by federal agencies are the Henry M. Jackson Building and the Federal Office Building. Both are located between Western and Second Avenues south of Marion Street. Other key federal government buildings in the study area include the U.S. Post Office Main Office and the Pioneer Square Post Office. The U.S. Coast Guard Station located at Pier 36 is the government installation located closest to the Alaskan Way Viaduct. Other government offices, such as the U.S. Ninth District Court, are located in downtown Seattle, but are located outside of the boundaries of the study area.

The State of Washington has many agency offices located in downtown Seattle, though most of them are scattered among the city's many office buildings, and most are located outside of the study area. The Colman Dock Ferry Terminal is located at Pier 52 and is the only state facility in the study area. The Port of Seattle is a special government district that has headquarter offices located at the far north end of the Seattle waterfront, immediately adjacent to the seawall.

Exhibit 4-24. Key Government Institutions in the Study Area

Government Institution
City
Municipal Court of Seattle
Seattle Municipal Building
Seattle Parks & Recreation Department
Seattle Parks & Recreation Maintenance Division
Seattle Public Library (under construction)
Seattle School District #1 Admin. & Service Center
County
King County Administrative Center
King County Courthouse
King County King Street Center
King County Library Offices
Senior Services of Seattle/King County
Special District
Port of Seattle – Cruise Ship Terminal at Pier 30 (Holland America Line and Princess Line)
Port of Seattle – Hanjin Shipping Co. Terminal at Pier 46
Port of Seattle – Cruise Ship Terminal at Pier 69 (Norwegian Cruise Line)
Port of Seattle – Marine Headquarters at Pier 69
State
Washington State Ferries Terminal at Pier 52
Federal
Federal Office Building
Henry M. Jackson Federal Building
U.S. Coast Guard at Pier 36
U.S. Post Office – Main Office
U.S. Post Office – Pioneer Square Office

Several City and County office buildings are clustered in the six-block area between Third and Sixth Avenues and Cherry and Jefferson Streets. A new Seattle Public Library is currently under construction on Fourth Avenue between Spring and Madison Streets. The Seattle Parks and Recreation Maintenance Division is located at Denny Park.

4.10 Neighborhood Cohesion

As described in the above sections, the project study area lies at the center of the Puget Sound region and encompasses a number of diverse Seattle neighborhoods. Land uses, population characteristics, public facilities, community services, and special landmarks all help to define these neighborhoods. Transportation services and infrastructure define accessibility within and between the neighborhoods. A key aspect of cohesion is connectivity of land uses, facilities, services, and population; and the inter-relationships between these elements that define the human environment.

The following sections highlight these issues that define the cohesiveness of the study area as a whole and the several neighborhoods traversed by the project corridor.

4.10.1 Transportation Services and Infrastructure

SR 99 is one of two major highways that provide direct access to downtown Seattle. The route is a primary north-south arterial located west of I-5. It follows the Duwamish Waterway, the city waterfront, and continues north through several neighborhoods. High volumes of traffic (including passenger vehicles, commercial vans, delivery trucks, freight trucks, taxis, and buses) use the highway daily. Appendix C, Transportation Discipline Report, provides a detailed description of this facility and the function of this facility in the regional transportation network.

The existing SR 99 is generally constructed at-grade in the south section of the study area. As it proceeds north, the roadway becomes elevated above surface streets at about S. Holgate Street as it follows the waterfront. Towards the north end of the project study area, the elevated roadway enters the Battery Street Tunnel to traverse the residential Belltown and South Lake Union neighborhoods. At approximately John Street, the roadway emerges from the tunnel to again become an at-grade roadway.

This profile of the roadway, however, affects the use of local streets. In the south end of the study area, SR 99 generally has no intersections or interchanges with other streets. Through much of the downtown waterfront, the existing Alaskan Way Viaduct is elevated and local streets cross under the roadway structure, thus not interrupting local traffic flow. Access to and from the elevated portions of the Alaskan Way Viaduct, however, is limited to only a few on- and off-ramps in the downtown area. There are no on- or off-ramps to the Battery Street Tunnel from ground-level streets, and aboveground traffic passes over the tunnel on local surface streets.

As the traffic emerges from the Battery Street Tunnel, the local street grid is disrupted by the differences in elevation between SR 99 and the adjacent local streets, the high volume of traffic, and use of concrete barriers between the two directions of traffic. Between Denny Way and Ward Street at the far north end of the project study area, there are two existing streets that allow traffic to travel from the west side of the project corridor to the east side. These streets are Mercer and Broad Streets. For all other streets, traffic is only allowed to make right turns off of SR 99 to local streets, and local street traffic is only permitted to make right turns to merge with traffic on SR 99. As such, the roadway interrupts the local street network at both the southern and northern limits of the project study area.

Most of the project area is accessible by public transit from outside of the downtown area. Buses, taxis, the monorail, and a waterfront trolley provide transportation service throughout the central business district and waterfront area. In addition, there is no charge to use the buses serving the central business district. This level of service provided at minimal cost to transit riders is a critical support service to downtown residents, especially those who are low-income, homeless, and/or reliant on transit.

4.10.2 Land Uses

Along the project corridor, different types of land uses are both separated and split by SR 99. At the south end of the project study area, the roadway traverses light industrial land uses. Warehouses, wholesale, and manufacturing businesses are primarily located east of the roadway. The Port of Seattle container ship loading facilities are located west of the roadway. The roadway, however, splits the Whatcom Rail Yard and the BNSF SIG Yard. Further north, elevated portions of the roadway separate the Port of Seattle facilities from the mixed residential, retail, and light industrial land uses near Safeco Field and the Seahawks Stadium.

In the central downtown area, the elevated Alaskan Way Viaduct lies immediately adjacent and to the east of the Alaskan Way surface street. The Colman Dock Ferry Terminal, restaurants, tourist-oriented retail shops, the Seattle Aquarium, a small marina, and the Bell Harbor International Conference Center at Pier 66 are located adjacent to the two roadways. Mixed land uses, including high-rise offices, restaurants, retail shops, and residential buildings, extend along the east side of the Alaskan Way Viaduct. As such, the land uses are quite similar, and the elevated roadway is a physical as well as a visual obstruction between the land uses.

At the north end of the project study area, land uses are more typically lower-density residential buildings and smaller-scale business and office buildings. Through much of this portion of the corridor, the roadway is in a tunnel. Here, the project corridor does not act as an obstruction to divide the neighborhood either physically or visually. North of Denny Way, however, vehicles on SR 99 leave the Battery Street Tunnel. The difference in elevation and the use of retaining walls cause the roadway to act as a physical obstruction that divides the Uptown and South Lake Union neighborhoods. Pedestrian movement is also interrupted in the neighborhood because of the roadway. Since SR 99 is below-grade or at-grade, the roadway is not the visual obstruction it is along the central waterfront. For additional details on land uses in the project area, please see Appendix G, Land Use and Shorelines Technical Memorandum.

4.10.3 Population Characteristics

Different types of people use different portions of the project corridor. In the south segment, the predominant light industrial land uses and activities at the Port of Seattle facilities and railroad tracks in the Duwamish neighborhood mean that the population is primarily workers present during weekday business hours. To the north, as the roadway enters the Pioneer Square neighborhood, the population becomes mixed. There are office workers, residents (including homeless persons), visitors, and others. A portion of this mixed group of populations is present at all times. Other segments of the population, however, are present only during weekday business hours, sports events, or tourist seasons.

Along the central portion of the Alaskan Way Viaduct, the population is more predominantly weekday office workers and visitors. The exception is the large numbers of residents of the region riding the ferries to and from work or to and from vacation and second home destinations. Increasingly, however, residents of downtown apartments and condominiums are a part of the mix of people found in the central segment.

The population characteristics of the northern portion of the project corridor are similar to those of the Pioneer Square neighborhood. There are many apartment buildings and condominiums, including a large concentration of low-income, subsidized, transitional, and emergency housing. Residents patronize the neighborhood retail shops and restaurants. The many performing arts, entertainment, and sports events held at the Seattle Center attract large evening and weekend crowds. The theatres, museums, and other cultural resources at the Seattle Center attract visitors as well.

4.10.4 Linkages to Community Facilities

Most of the residents of the project study area have few linkages with the many community facilities found in the community. There is no community center in the project study area. There are only a few schools or educational institutions in the area. Furthermore, the number of religious institutions is small considering that the population of the study area is over 15,000. The theatres, performing arts centers, and sports stadiums attract people from the region. Undoubtedly, residents of the study area attend the cultural and arts events, but the large proportion of low-income and homeless persons residing in the area would have little income to spend on such events. As such, the linkages between the many community facilities in the project study area and a large proportion of its residents are weak.

4.10.5 Ties to Community Services

As described in the sections above, there are many community and social services operating in the project study area. These services include emergency housing, counseling, hot meals, food banks, public hygiene and health clinics, employment referrals (including day labor opportunities), and other services. Some of these services provide assistance to people residing outside of the immediate area. The vast majority of these services, however, help support the many low-income and homeless persons residing in the project area. A substantial portion of study area residents depend on existing linkages of community and social services for their survival.

4.10.6 Unique Community Identity

The Pioneer Square area, in the south end of the project area, is an important symbol of the city and its historic early days as the shipping off point for thousands of miners heading for the Klondike Gold Rush in Alaska. In particular, the totem pole and pergola at the square as well as the Smith Tower represent the surrounding historic district. In the central portion of the study area along the waterfront, the ferries are a unique symbol of Washington and the city of Seattle. Ferries provide residents and visitors with easy and affordable transportation across Puget Sound. The piers and ferries broadly represent the community's ties to the waterfront, Puget Sound, the San Juan Islands, the fishing industry, and international trade.

The International District is located east of the study area, but also serves as a unique element in the city. This district was originally home to Seattle's many Chinese residents who migrated to Seattle at the turn of the nineteenth century and early twentieth century. Today, this district is the heart of Seattle's Asian communities. Chinese, Japanese, Vietnamese, and Korean retail businesses, restaurants, grocery stores, and produce markets are found in this neighborhood.

The Pike Place Market, Seattle Center, and the Seattle Space Needle are all located in the north segment of the project corridor. The Pike Place Market is one of the country's oldest continuously operating farmers' markets, and it annually attracts thousands of downtown workers, visitors, and residents alike. At over 600 feet, the Space Needle represented the futuristic space-age theme of the 1962 World's Fair held at the Seattle Center. On a clear day, the observation deck offers territorial views of Puget Sound, the San Juan Islands, and the Olympic and Cascade Mountains.

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Chapter 5 OPERATIONAL IMPACTS AND BENEFITS

This section of the technical memorandum describes anticipated effects on social resources following construction of the proposed project alternatives. These effects are referred to as operational impacts and include both adverse effects and benefits. Effects on population and housing, community facilities, religious institutions, social and employment service providers, cultural and social institutions, and government institutions are discussed for each proposed project alternative, including the No Build Alternative. For a detailed description of the proposed project alternatives, see Appendix B, Alternatives Description and Construction Methods Technical Memorandum. Other topics included as part of an analysis of impacts to social resources as defined by the WSDOT *Environmental Procedures Manual* (March 2003) are discussed in separate technical memoranda, including parks and recreation (Appendix H), environmental justice (Appendix J), and public services and utilities (Appendix O).

The first several sections comprehensively describe the anticipated adverse effects for each alternative by roadway segment: south, central, north waterfront, and north segments. Brief qualitative statements about potential effects are provided for alternative options. Potential effects for the entire length of the proposed seawall alternatives are also described. Following these sections is a summary of the benefits of each alternative. Mitigation measures for operational impacts are discussed separately in Chapter 8.

5.1 No Build Alternative

5.1.1 Scenario 1 – Continued Operation of the Viaduct and Seawall with Continued Maintenance

Under Scenario 1 of the No Build Alternative, the viaduct and seawall will continue to operate. Plans to rebuild or replace the existing facilities will be deferred. Plans will be made at some time in the future to rebuild or replace both the roadway and the seawall. Annual maintenance work and repairs will continue to be planned and made to the facilities so they will continue to operate. Unplanned maintenance may also be required. During such maintenance, work may require temporary closures of the viaduct and/or Alaskan Way surface street. Both facilities will likely be replaced before 2030.

No changes will occur to the existing SR 99, Alaskan Way Viaduct, Battery Street Tunnel, Aurora Avenue N., or seawall. Traffic will continue to use the existing roadway. Existing parking spaces, both on-street and off-street, will continue to be available. Peak traffic congestion will be slightly more than

current conditions. The number of congested intersections will increase slightly for each segment, but the duration of peak traffic conditions on SR 99 will remain similar to current conditions, approximately 4 hours per day.

With this alternative, no direct, long-term changes are likely to substantially affect surrounding neighborhoods, their residents, public facilities, social service providers, cultural and social institutions, or government institutions. Current neighborhood cohesion conditions will remain intact.

5.1.2 Scenario 2 – Sudden Unplanned Loss of the Facilities, but Without Major Collapse or Injury

Scenario 2 of the No Build Alternative assumes operation and maintenance of the viaduct and seawall will continue, but a minor or moderately sized earthquake will occur. Such an event could lead to sudden unplanned damage or weakness to the viaduct and/or seawall. It could require temporary road closures, minor or major repairs of the structure(s), possible damage to adjacent buildings or piers, potential relocation of businesses or residents, temporary traffic detours, and other related disruptions in the community.

This damage to the viaduct and seawall could affect social resources located in adjacent buildings. Adjacent social resources include the U.S. Coast Guard Complex, St. Martin de Porres Shelter, the Colman Dock Ferry Terminal, and the Seattle Aquarium. Access to these buildings could be affected.

Continuing north along the waterfront, seawall damage could affect the Bell Street Conference Center, Odyssey Maritime Discovery Center, the Port of Seattle cruise ship terminal and headquarter offices, and the waterfront trolley on the Alaskan Way surface street. Continuing to the Battery Street Tunnel and north to Aurora Avenue N., damage could affect the CASA Latina Day Workers' Center, the Catholic Seamen's Club, the Lexington/Concord Apartments (subsidized housing), the Art Institute, and Antioch University. The actual extent of damage to adjacent buildings, if any, is unknown and would depend on the strength of the earthquake.

Together, the loss of one or more of these buildings could affect a number of residents in the community. The damage could require low-income persons and elderly persons to relocate. This could be extremely upsetting to some residents who may have resided in their home for many years and/or may not have financial resources to relocate. In addition, there could be a temporary loss of a substantial number of beds for homeless persons. Employment referral and social service agencies, including those who assist low-income and homeless persons, may need to temporarily disrupt some or all of their services. In addition, vehicular, transit, and pedestrian access within the

downtown area as well as to outlying areas would likely be disrupted for some period of time. Local and state emergency management agencies, the Red Cross, and other such organizations would help mitigate these unplanned disruptions, but it would be at great financial and emotional cost to the community.

5.1.3 Scenario 3 – Catastrophic Failure and Collapse of the Viaduct and/or Seawall

Scenario 3 of the No Build Alternative assumes operation and maintenance of the existing viaduct and seawall will continue, but a major earthquake would occur at the some time in the foreseeable future. Such an event could cause extensive damage or total destruction to the Alaskan Way Viaduct (SR 99), the Battery Street Tunnel, and/or the seawall. Adjacent buildings would likely be damaged. Another risk associated with a major earthquake would be potential fires caused by damage to underground oil and natural gas pipelines and to electrical equipment. Moreover, the challenge to contend with such fires would depend upon the extent of damage to underground water mains needed to control and extinguish one or more fires. Potential damage to social and community resources and potential interruption of social services could be severe, though emergency management agencies would be prepared for such an event. The effects of Scenario 3 would be more severe and more extensive than the effects described for Scenario 2. Disruptions to the community would be much longer in duration, potentially many months or even years. Such circumstances would result in substantial adverse impacts on the community.

5.2 Impacts Common to All Build Alternatives

The following sections discuss potential effects to social resources following construction of any one of the proposed project Build Alternatives—the Rebuild, Aerial, Tunnel, Bypass Tunnel, and Surface Alternatives. The analysis focuses on effects primarily due to right-of-way acquisition and effects on population and housing common to all alternatives.

5.2.1 Population and Housing

The proposed AWV Project is a transportation project and does not involve the construction of new housing in the study area. As such, the construction of any one of the project Build Alternatives will not result in a direct increase in housing or population in the project study area.

The construction of the proposed Build Alternatives will not require the acquisition of any existing housing in the project corridor. Properties acquired for right-of-way for any of the proposed project Build Alternatives

will not include single-family houses, apartment buildings, condominiums, special needs housing, or emergency housing. Properties proposed to be acquired are currently vacant, parking lots or garages, industrial or manufacturing buildings, retail or wholesale commercial buildings, or office buildings. Appendix K, Relocations Technical Memorandum, provides detailed information about the properties that will be acquired. Appendix P, Economics Technical Memorandum, provides detailed information on potential displacement of businesses and jobs. As no residential buildings will be acquired, no persons will be displaced from existing residences. None of the Build Alternatives will directly result in decreases in population or housing.

The operation of the proposed Build Alternatives will require workers to repair and maintain the infrastructure. Workers will be required for all of the Build Alternatives to monitor the proposed fire/life safety equipment and other facilities associated with the Build Alternatives. The number of employees will likely be small and already employed by WSDOT, Seattle Department of Transportation, Seattle Public Utilities, Seattle City Light, and other private utility personnel; therefore, the project may not create any new jobs. Any new jobs will be a very small number and persons will likely be hired from the regional labor force, as the types of new jobs will not likely require employees with highly specialized skills. The project will not likely attract workers from outside of the region and thus will not result in increases in regional population or demand for housing.

5.2.2 Community Facilities

No community facilities will be affected long-term by any of the project alternatives due to property acquisition. Right-of-way acquisitions will not include the purchase of property currently used by childcare facilities, public schools, instructional institutes, or professional or technical schools or colleges.

5.2.3 Religious Institutions

None of the project Build Alternatives will require the purchase of property currently used by religious institutions.

5.2.4 Social and Employment Services

Under all Build Alternatives, the acquisition of property currently owned by Seattle City Light would displace the CASA Latina Day Workers' Center, which currently leases the site for day labor referral. From two trailers on-site, this organization assists primarily low-income and minority persons find

casual day labor jobs. Permanent positions are also found for clients. In 2002, this organization dispatched an estimated 6,700 jobs (Stern and Zamora 2002).

5.2.5 Cultural and Social Institutions

None of the project Build Alternatives will require the purchase of property currently used by cultural or social institutions.

5.2.6 Government Institutions

The acquisition of required right-of-way for any of the project Build Alternatives will not adversely affect any of the government institutions located in the study area. No local, state, or federal government agency offices will be affected. No national defense installations will be affected.

Each of the alternatives, however, includes modification of the existing access to the Colman Dock Ferry Terminal. This will ensure vehicular access to the parking holding area for the ferries during construction of the AWV Project. The revised access will require acquisition of property and buildings currently located at Terminal 46. This site is owned by the Port of Seattle, but the Hanjin Shipping Company Ltd. has a long-term lease for use of the property. The company is a major handler of container ship cargo entering and exiting the Port of Seattle. The several buildings located on this property that could be affected by right-of-way acquisition include (1) a storage warehouse and maintenance building, (2) an administrative building, and (3) a guard shack and restroom facilities. Other minor facilities, including scales, gates, and utilities, could also be affected.

5.2.7 Neighborhood Cohesion

Potential changes to neighborhood cohesion could occur following construction of one of the Build Alternatives. A key aspect of cohesion is connectivity. For this project, connectivity between the region and the project corridor neighborhoods, as well as between neighborhoods, will change for certain segments of the project corridor. In the south segment, there will be a substantial improvement in SR 99 connectivity with SR 519 and local streets in the stadium area for all alternatives. In contrast, the connectivity between SR 99 and the north waterfront segment will generally decrease in the Elliott Avenue and Western Avenue corridor. In the north segment, there will be trade-offs between the proposed changes for the Mercer Street corridor and the local street grid. For additional information, please see Appendix C, Transportation Discipline Report.

The designs of the proposed project alternatives affect predicted volumes of traffic using SR 99, the Alaskan Way Viaduct, parallel arterials, and Aurora

Avenue N. The alternatives also will affect travel routes and durations, transit service, pedestrian access, and the character of land uses in neighborhoods. In particular, right-of-way acquisition will eliminate some industrial, warehouse, parking facilities, offices, and commercial businesses. These topics are discussed in detail for each of the project alternatives below.

Noise levels for the project alternatives are predicted to be similar to current levels despite forecasted increases in traffic volumes for all Build Alternatives. The existing facility operates near or exceeds roadway capacity. The future roadways will also operate close to capacity. Noise levels from traffic volumes are only a portion of total noise levels. In urban areas, a large proportion of the total noise comes from other sources. The predicted noise levels for the Build Alternatives in the downtown core will generally approach or exceed FHWA noise abatement criteria. For additional information, please see Appendix F, Noise and Vibration Discipline Report. As changes in noise levels are generally not substantial, and will not have substantial adverse effects on neighborhood quality.

Air quality levels for the Build Alternative are generally predicted to be below current levels (2030). The computer modeling of key project corridor intersections was based on forecasted peak condition traffic volumes, speeds, and congestion. Criteria pollutants modeled include: carbon monoxide, nitrogen oxides, ozone, sulfur dioxide, lead, greenhouse gases (carbon dioxide), and particulates. The modeling indicated that there would be a few localized increases above existing conditions, and overall conditions would be less than current conditions due to anticipated improvements in anti-pollution technology and the reduction in the number of vehicles without appropriate pollution equipment. In all cases, the predicted air quality levels are anticipated to be below the National Ambient Air Quality Standards (NAAQS) for the project corridor.

5.3 Rebuild Alternative

For the Rebuild Alternative, there is only one engineering concept proposed. No alternative options are proposed. The alternative will be very similar to existing conditions. The Battery Street and Western Avenue ramps, however, will be closed except for emergency use. Connectivity will continue to be very similar to existing conditions.

5.3.1 South – S. Spokane Street to S. King Street

In the south segment of the Rebuild Alternative, SR 99 will be rebuilt in nearly the same alignment as the existing roadway. Near the Whatcom Rail Yard, the alignment of the new at-grade roadway will be relocated to the west of the

existing alignment, allowing the Whatcom Rail Yard to be combined with the exiting BNSF Seattle International Gateway (SIG) Rail Yard. Ramps will ascend from SR 99 to provide access on and off of the elevated SR 519 between S. Atlantic Street and S. Royal Brougham Way. At approximately S. Dearborn Street, SR 99 will transition to a side-by-side aerial structure.

Forecasted peak traffic conditions in this segment will be more congested than current conditions. A total of three intersections would be congested, where none are currently congested. The duration of congestion on SR 99 would remain similar to current conditions (approximately 3 to 4 hours). The loss of approximately 311 spaces, or 37 percent of available parking spaces (three-quarters long-term, on-street parking) will occur under this alternative.

Population and Housing

Travel to area residential development and overall traffic patterns in the south segment of the Rebuild Alternative will be very similar to current conditions of connectivity, though travel times could increase somewhat. No adverse effects will be experienced by residents in the few residential buildings located in this segment. The exception will be that traffic volumes near the St. Martin de Porres Shelter are expected to increase, which could affect both vehicular and pedestrian travel to and from this homeless shelter (Goetchius 2002).

Community Facilities

There is only one community facility located in the south segment of the study area: the John Stanford Center for Educational Excellence. This facility is not immediately adjacent to the alignment of the Rebuild Alternative, so vehicular, transit, and pedestrian travel routes to this facility are not anticipated to change following construction of the Rebuild Alternative.

Religious Institutions

There are no religious institutions located in the south segment, so there will not be any long-term effects on such facilities.

Social and Employment Services

There are only two social or employment service providers located in the south segment. These are the proposed new DSHS halfway house and the Salvation Army Adult Rehabilitation Center. Both facilities are several blocks from roadway improvements proposed as part of the Rebuild Alternative and will not be affected long-term. Direct access to and from these facilities will be very similar to current conditions, and traffic patterns are generally not expected to change in the vicinity of these facilities. No adverse effects will occur.

Cultural and Social Institutions

There are several major cultural and social institutions located in the south segment. These facilities include the Seahawks Stadium, Safeco Field, Stadium Exhibition Center, and the U.S. Coast Guard Museum of the Northwest. All of these facilities are clustered in the vicinity of the proposed grade-separated SR 519 ramps. General vehicles and transit vehicles are expected to use the new ramps. Traffic patterns before and after sports events will be different from current conditions. The new ramps will help reduce the duration of congestion following large sports events. Travel routes to these facilities using local streets are not likely to change. Under this alternative, there will be a reduction in parking spaces, which could adversely affect some visitors to the stadiums. The number of parking spaces lost, however, will likely be only a very small percentage of the total number of spaces required for the thousands of fans attending stadium events. Overall, no adverse effects on these facilities are expected.

Safeco Field is the focus of a number of regional charity walks and runs in which tens of thousands of people participate. These include the St. Patrick's Day Dash, the Susan B. Komen Race for the Cure, and others. The route of these events typically start and end at the sports stadium and make a loop on a portion of the existing elevated Alaskan Way Viaduct. All vehicular traffic is diverted off of the viaduct during these events. Proposed roadway changes under the Rebuild Alternative will not substantially alter the starting point, ending point, or route of these charity runs. The proposed roadway improvements could offer new opportunities to change the current route of these events, including incorporating the new SR 519 ramps into the route.

Government Institutions

Other than Terminal 46 (discussed above), there is only one additional major government institution located in the south segment (see Section 5.2.6). This is the U.S. Coast Guard facility located on the west side of the project corridor at Pier 36. New ramps connecting SR 99 and SR 519 will be constructed east of this facility, but other existing ramps on and off of SR 99 will be rebuilt in nearly the same configuration as current conditions. Direct access to and from the site and general travel patterns in the vicinity of this facility will not change substantially in the future. As such, there will be no adverse effects on this government institution.

Neighborhood Cohesion

The street network and links to existing community facilities and services with the Rebuild Alternative in the south segment will be very similar to existing conditions. A total of four non-residential structures would be

acquired, but none of the businesses in these structures serve neighborhood needs. An estimated 193 jobs could be displaced, but this would not be a substantial change considering the large number of workers in the Duwamish industrial area. The new SR 519 ramps will increase perceived accessibility to shops and businesses located in the stadium area. Pedestrian movement and interaction of people should be similar to existing conditions. The effects on neighborhood cohesion in the south segment are expected to be mixed.

5.3.2 Central – S. King Street to the Battery Street Tunnel

In the central segment, the existing Alaskan Way Viaduct (SR 99) will be rebuilt in nearly the same alignment as the existing roadway. The future configuration will be the same stacked aerial structure. Slight modifications will occur north of Union Street to retrofit the existing structure as it approaches the Battery Street Tunnel. All existing ramps on and off of the elevated structure will be retrofitted. The existing on- and off-ramps at Battery Street and Western Avenue will be closed, except for emergency access.

Peak traffic conditions in this segment are forecasted to remain similar to current conditions, though two intersections would change from moderately congested to highly congested. The duration of SR 99 congestion would be similar to existing conditions. The availability of parking spaces (approximately 874 spaces) will be slightly greater than existing conditions. There will be a loss of 8 parking spaces in the Pioneer Square area and a net gain of 43 spaces in the central waterfront area.

Population and Housing

With the Rebuild Alternative, vehicular, transit, and pedestrian travel to residential buildings and general traffic patterns in the central segment will be similar to current conditions. Traffic associated with the ramps will also be similar to current conditions. The Battery Street and Western Avenue ramps to SR 99 will be restricted to emergency use only. Traffic volumes on First Avenue S. are expected to decrease slightly and will likely be perceived as an improvement to current conditions for residents living in close proximity to these ramps. Vehicle, transit, and pedestrian access to and from the Bread of Life Mission and the Lutheran Compass Center facilities are not expected to change. No adverse effects will occur.

Community Facilities

There are a number of community facilities, including childcare facilities, public schools, technical schools, and a university branch campus, located in the central segment. No buildings are located within close proximity to the

proposed roadway, so direct access to such facilities will not need to be modified. General travel patterns are not expected to change substantially for the Rebuild Alternative, so travel routes to these community facilities is not expected to change in the future.

Religious Institutions

Several religious institutions are located in the central segment, but most are more than two blocks away from proposed road improvements for the Rebuild Alternative. The Anchorpointe Seventh-Day Adventist Church, however, is located across the street from the Seneca Street on-ramps. These ramps will be rebuilt under this alternative. Direct access and traffic patterns in the vicinity of religious institutions will not change. No adverse effects will occur.

Social and Employment Services

The central segment encompasses an area that has a substantial number of low-income residents who require social and employment services. Many such services are located in this portion of the project corridor. In the central segment, none of the existing social and employment services (exclusive of emergency or special needs housing services described above) are located immediately adjacent to proposed improvements associated with the Rebuild Alternative. Direct street access to buildings containing social and employment service providers will not change for pedestrians. Local street access as well as vehicular access from the rebuilt SR 99 will be nearly the same as existing conditions.

For clients of these social and employment services, pedestrian and bus access is not expected to change substantially. The restricted use of the Battery Street and Western Avenue ramps immediately south of the Battery Street Tunnel will change travel routes for some potential employers who might hire workers through social services like the Millionaire Club Charity. Also, the Catholic Seamen's Club uses these ramps, but will be able to use alternate travel routes to the facility (Waud and Dias 2003). The proposed road improvements associated with the Rebuild Alternative will not differ substantially from existing conditions, so local street access between social and employment service providers will not be adversely affected. Neither vehicle access nor parking for social service volunteers would likely change substantially. These potential changes will not result in adverse effects to either providers or clients of social and employment service organizations.

Cultural and Social Institutions

There are a number of cultural and social institutions located in the central segment, but all are located several blocks away from proposed roadway

improvements for the Rebuild Alternative. Direct vehicular and pedestrian access, as well as general vehicular and transit access to these institutions, will be very similar to current conditions. All but one pair of downtown ramps on SR 99 will be maintained. The Battery Street and Western Avenue ramps will be closed to general use, but available for emergency access. No adverse effects will occur to cultural and social institutions under the Rebuild Alternative.

Government Institutions

Many City of Seattle, King County, Washington State, and federal government office buildings are located in the central segment. The City and County offices and court facilities are primarily located on Third and Fourth Avenues at the south end of downtown near Yesler Way. Except for the Pioneer Square Post Office, the federal offices are generally located north of the local government offices and between First and Second Avenues. Direct street access as well as general vehicular, transit, and pedestrian access to these buildings will not change for the Rebuild Alternative.

The primary government property located in close proximity to the proposed roadway improvements for the Rebuild Alternative is the Colman Dock Ferry Terminal (Pier 52). The proposed alignment of the Alaskan Way surface street in front of the pier will be altered and will be slightly west of the existing roadway. For additional detail, see Appendix C, Transportation Discipline Report. The new alignment will require relocation of the existing historic Washington Street Boat Landing to the western end of Pier 46, and pedestrian access will be established to the new site. In addition, access to the ferry dock will be modified to ensure access to the dock during construction of the AWW Project. These changes will not result in adverse effects.

Neighborhood Cohesion

The proposed Rebuild Alternative in the central segment will be very similar to current conditions defining transportation network connectivity, traffic congestion, and parking. Perceived accessibility to shops and businesses in this segment will not change. Right-of-way acquisition would require purchase of four non-residential structures. This would affect an estimated 141 jobs, a small proportion compared to the total in the area. None of the businesses serve the retail and service needs of the surrounding neighborhood. The movement and interaction of people, both residents and workers, will be very similar to existing conditions, especially considering the alternative includes replacement of the Marion Street pedestrian bridge over the Alaskan Way surface street. Changing the use of the Battery Street and Western Avenue ramps could be perceived as an improvement in the

neighborhood due to potentially lower levels of traffic. The elimination of the ramps for general use, however, could also create inconveniences for local residents who currently use the ramps. Long-term effects on neighborhood cohesion are expected to be mixed.

5.3.3 North Waterfront – Pike Street to Broad Street

The existing Alaskan Way surface street will be rebuilt in its existing footprint in the north waterfront segment of the Rebuild Alternative. No property will be acquired in this segment, and direct access to adjacent buildings will not change. Peak traffic congestion is forecast to increase somewhat. Available parking spaces (net gain of 6 spaces) and pedestrian access would be similar to existing conditions. Furthermore, long-term use of this roadway is expected to be very similar to current use. General access to community facilities, religious and cultural/social institutions, social and employment services, and government institutions will generally be very similar to current access. Neighborhood cohesion in this segment of the project alternative is not expected to change. Proposed changes in this segment of the Rebuild Alternative are not expected to result in any adverse effects on social resources.

5.3.4 North – Battery Street Tunnel to Ward Street

For the Rebuild Alternative, no improvements will be made to the Battery Street Tunnel, Aurora Avenue N., Mercer Street, or any of the other east–west streets in close proximity to Mercer Street. Parking spaces will not be affected long-term. Peak traffic conditions are forecasted to be somewhat more congested. The number of congested intersections will increase from three to five, though the duration of congestion on SR 99 would be similar to current conditions.

There will be little effect on population, housing, community facilities, religious institutions, social and employment services, cultural and social institutions, or government institutions. There will be no property acquisition in this segment nor loss of businesses or jobs. There will be no need to make minor modifications to existing access to buildings (e.g., driveways, stairs, doors). General use of the existing local streets will be the same as current use. The attributes of current neighborhood cohesion will continue for the foreseeable future. The street grid in the South Lake Union neighborhood will remain discontinuous and parking availability will be similar to existing conditions.

5.3.5 Seawall – S. King Street to Myrtle Edwards Park

For the Rebuild Alternative, the existing seawall will be rebuilt from S. King Street to Virginia Street. From Virginia Street north to Myrtle Edwards Park, exclusive of the section at the Cruise Ship Terminal (Pier 69), the seawall will also be rebuilt. No properties will be acquired.

These improvements are not expected to affect social resources long-term. The new seawall will be placed in an alignment similar to the existing structure. It will be below the level of the roadway pavement and therefore will not be any more visible to passersby than the current seawall. Nearby residents and housing will not be directly affected. There are no community facilities or religious institutions located in close proximity to the seawall. The provision of services by social services and employment organizations will not be affected. Following construction of a new seawall, there will be no effects to access to or operation of nearby cultural and social institutions. Use of the existing Port of Seattle offices located at Pier 69 will continue.

A new seawall will not affect neighborhood cohesion long-term. Land uses, linkages with community facilities, ties to community services, and the unique characteristics of the Seattle waterfront are not expected to change. People will continue to walk and drive along the waterfront and have access to the shops, restaurants, the Seattle Aquarium, and the Odyssey Maritime Discovery Center. A new seawall will not be visible, so views of Elliott Bay will not be affected. The Washington Street Boat Landing will need to be relocated, potentially nearby to Pier 48. This minor relocation is not expected to substantially change current patterns of congregation and interaction of people at this historic landmark.

5.4 Aerial Alternative

The Aerial Alternative proposes double-stacked configuration for replacement of the roadway as well as an optional design concept for the south and north segments of the roadway. A proposed alternative as well as an option are also proposed for the seawall. The alternatives and options for the viaduct and seawall are evaluated below.

5.4.1 South – S. Spokane Street to S. King Street

Stacked Aerial With SR 519 At-Grade

In the south segment, no improvements are proposed between S. Spokane Street and S. Stacy Street. The existing at-grade roadway north to approximately S. Walker Street will be rebuilt along the existing alignment, thus continuing to separate the Whatcom Rail Yard and the BNSF SIG Rail

Yard. Between S. Walker Street and S. Massachusetts Street, the roadway will start to transition to an aerial side-by-side structure and then a double-stacked aerial configuration. This structure will be on an alignment to the west of the existing Alaskan Way Viaduct. Ramps will descend from the aerial structure to provide access to the at-grade SR 519. The aerial structure for SR 99 will continue north of the SR 519 ramps.

Peak traffic conditions are forecasted to be slightly more congested than current conditions with an increase to two moderately congested intersections (none exist now). The duration of congestion on SR 99 will be similar to current conditions (approximately 3 to 4 hours). The proposal, however, will result in a modest decrease of 121 parking spaces, or 15 percent, in available parking spaces in the area. Though there will be more than a doubling of available short-term, on-street parking, there will be a loss of approximately 81 percent of existing long-term, on-street parking spaces.

Population and Housing

Access to residential development and traffic patterns for the south segment of the Aerial Alternative will be similar to current conditions. Vehicular access, including the daily transport of residents between the Lazarus Day Center in the Pioneer Square area and the St. Martin de Porres Shelter, could be affected due to the new SR 519 ramps proposed immediately north of S. Massachusetts Street. The additional congestion will affect the ability of drivers to turn from St. Martin de Porres into traffic flow on the Alaskan Way surface street. In addition, the new ramps will change traffic patterns and volumes. These changes should not affect pedestrian access to the facility. As described for the Rebuild Alternative, no adverse effects will be experienced by the few residents living in this segment.

Community Facilities

The John Stanford Center for Educational Excellence is not located in close proximity to the alignment of the Aerial Alternative. Direct access and general travel patterns are not anticipated to change, so general access to this facility is not expected to change long-term.

Religious Institutions

There are no religious institutions located in the south segment, so there will be no long-term effects on such facilities.

Social and Employment Services

The proposed new DSHS halfway house and the Salvation Army Adult Rehabilitation Center are the only two social or employment service providers located in the south segment. Both facilities are several blocks from roadway

improvements proposed as part of the Aerial Alternative and will not be affected long-term. Vehicle, transit, and pedestrian access to these facilities and the general pattern of traffic are not expected to substantially change in the vicinity of these facilities. No adverse effects will occur.

Cultural and Social Institutions

Cultural and social institutions located in the south segment include the Seahawks Stadium, Safeco Field, Stadium Exhibition Center, and the U.S. Coast Guard of the Northwest. All of these facilities are clustered in the vicinity of the proposed new grade-separated SR 519 ramps. The new ramps will likely be used to access to these facilities. Traffic patterns before and after sports events will be different from current conditions, and the new ramps will generally lessen the duration of congestion following events. Vehicular access to these facilities from local streets will not change. The substantial (40 percent) reduction in parking spaces could affect attendees at sports events, but the number of lost parking spaces will be very small compared to total parking required by sports fans. Overall, no substantial adverse effects are expected to affect these facilities under the Aerial Alternative.

In addition, Safeco Field is the focus of a number of regional charity runs, including the St. Patrick's Day Dash, the Susan B. Komen Race for the Cure, and others. The routes of these events typically incorporate the existing portions of the elevated Alaskan Way Viaduct and attract thousands of people. Proposed roadway changes under the Aerial Alternative, including the new alignment slightly to the west of the existing roadway, are not expected to substantially alter these events. The proposed new SR 519 ramps could offer new opportunities, including use of Alaskan Way surface street.

Government Institutions

Other than Terminal 46 (discussed above), the U.S. Coast Guard facility located at Pier 36 is the only major government institution located in the south segment. New ramps connecting SR 99 and SR 519 will occur east of the facility, but on an alignment slightly west of the existing elevated roadway. Other existing ramps on and off of SR 99 will be reconstructed in nearly the same configuration as the current facility. Neither direct access nor general travel patterns in the vicinity of this facility will change substantially. There will be no substantial adverse effects on government institutions.

Neighborhood Cohesion

Like the Rebuild Alternative, the Aerial Alternative in the south segment will result in street network connectivity and traffic congestion conditions that will be very similar to current conditions. Right-of-way acquisition will require the purchase of four non-residential properties, which could affect an

estimated 130 jobs in the neighborhood. None of the businesses displaced serve the retail and/or services needs of the surrounding neighborhood. Vehicular access to community facilities and services will be similar to existing conditions. The reduction in parking spaces, however, will alter perceptions of accessibility, which could adversely affect both residents and businesses in the area. The movement and interaction of people will likely be adversely affected due to the loss of parking, however, no substantial adverse effects are expected.

Option: SR 99 At-Grade With SR 519 Elevated Interchange

The option to the Aerial Alternative in the south segment would involve construction of an at-grade roadway and SR 519 would be elevated. Other proposed road improvements would be the same as proposed for the alternative. This option is the same configuration as proposed for the Rebuild Alternative, so the potential effects on social resources would be the same as described earlier for that alternative. No adverse effects are anticipated, as proposed roadway improvements would be very similar to existing conditions.

5.4.2 Central – S. King Street to the Battery Street Tunnel

In the central segment, the Aerial Alternative will be constructed as a stacked aerial structure. It will be constructed on an alignment similar to the existing Alaskan Way Viaduct. As the roadway approaches the Battery Street Tunnel, the existing structure will be reconstructed. The roadway will transition into a side-by-side configuration over the BNSF railroad tracks, Western Avenue, and Elliott Avenue. The roadway will then descend into the Battery Street Tunnel. Overall, the structure configuration, but not the alignment, will be similar to the existing viaduct. The existing on- and off-ramps at Columbia and Seneca Streets and Western and Elliott Avenues will be maintained. The ramps at Battery Street and Western Avenue, however, will be closed except for emergency access.

Peak traffic conditions will be slightly more congested than existing conditions with two intersections changing from moderately to highly congested conditions. The duration of congestion periods on SR 99 would be nearly the same as current conditions. Under this alternative, however, the number of parking spaces in both the Pioneer Square and central waterfront areas will decrease substantially. In the Pioneer Square area, there will be a loss of 88 parking spaces, or 47 percent (primarily short-term, on-street spaces). In the central waterfront area, there will be a loss of approximately 24 percent, approximately 157 parking spaces (nearly all short-term on-street spaces).

Population and Housing

Similar to the Rebuild Alternative, vehicular access to residential development and traffic patterns for the central segment of the Aerial Alternative will be similar to current conditions. Traffic associated with the ramps will be similar to current conditions. Vehicle and pedestrian access to the Bread of Life and the Lutheran Compass Center are not expected to substantially change, except that drivers could use the new SR 519 ramps located south of the facilities. Residents will no longer be able to use the Battery Street and Western Avenue ramps as they will be closed for general purpose use, but will continue to be available for emergency use. Vehicle routes and travel time to and from the downtown area will change slightly. Traffic volumes on First Avenue S. are expected to decrease and will likely be perceived as an improvement to current conditions for residents living in close proximity to the project corridor. No adverse effects will occur.

Community Facilities

Childcare facilities, public schools, technical schools, and a branch campus of a university are all located in the central segment. No community facilities are located within close proximity of the alignment, and direct vehicular, transit, and pedestrian access to these facilities will not change. General travel patterns are not expected to change substantially, so general access to community facilities in this segment is not expected to substantially change in the future. No adverse effects will occur.

Religious Institutions

Several religious institutions are located in the central segment, but most are more than two blocks away from proposed road improvements associated with the Aerial Alternative. The Anchorpointe Seventh-Day Adventist Church is located across the street from the Seneca Street on-ramps, which will be rebuilt. Overall, direct access and traffic patterns in the vicinity of nearby religious institutions will not substantially change. No adverse effects will occur.

Social and Employment Services

As described above for the Rebuild Alternative, the central segment encompasses an area that has a large number of low-income residents who require, even daily, the services of social and employment service organizations located in this portion of the project corridor. None of the existing social and employment services (exclusive of emergency or special needs housing services described above) are located immediately adjacent to proposed improvements. Direct street access to buildings containing social and employment service providers will not change. Local street access as well

as access from the new aerial structure will be nearly the same as existing conditions.

For clients of these services, pedestrian and bus access to these services is not expected to change substantially. The restricted use of the exiting Battery Street and Western Avenue ramps immediately south of the Battery Street Tunnel south portal will change access for some potential employers who might hire workers through social services such as the Millionaire Club Charity. The proposed road improvements will not differ substantially from existing conditions, so local street travel routes between service providers will not be affected. In addition, access and parking for volunteers with the social and employment services will not change substantially. The alternative will not result in adverse effects to either providers or clients of social and employment services.

Cultural and Social Institutions

Many cultural and social institutions are located in the central segment, but all are located several blocks away from roadway improvements proposed for the Aerial Alternative. Direct street access to these institutions, as well as general travel routes to these facilities, will be the same as current conditions. All except one pair of downtown ramps on SR 99 will remain. The restricted emergency use proposed for the Battery Street and Western Avenue ramps (southbound off-ramp and northbound on-ramp) will not likely be seen as a substantial change affecting many people. Current traffic usage is below expected volumes, which is thought to be due to existing non-standard design and safety concerns. No adverse effects will occur to these institutions.

Government Institutions

As described above for the Rebuild Alternative, many City of Seattle, King County, Washington State, and federal government office buildings are located in the central segment. Except for the Colman Dock Ferry Terminal at Pier 52, no direct street access will change for any of these facilities. In addition, general vehicular, transit, and pedestrian travel routes to these buildings will not change for the Aerial Alternative.

The primary government property located in close proximity to the proposed roadway improvements for this alternative is the Colman Dock Ferry Terminal (Pier 52). The proposed alignment of the Alaskan Way surface street in front of the pier will be altered, and both the surface street and the new aerial structure will be west of existing facilities. For additional detail, see Appendix C, Transportation Discipline Report and Appendix B, Alternatives Description and Construction Methods Technical Memorandum. The new alignments will require relocation of the existing historic Washington Street

Boat Landing to the western end of Pier 46. Pedestrian access will be established to the new site. In addition, access roads to the ferry dock will be altered to improve access to the dock for waiting vehicles. These changes will not adversely affect government institutions.

Neighborhood Cohesion

The proposed Aerial Alternative in the central segment is very similar to the Rebuild Alternative. Future traffic conditions will be similar to current conditions. Street networks and links to existing community facilities and services will not change substantially. Right-of-way acquisition will require the purchase of four non-residential structures, which could displace a total of 142 jobs in the neighborhood. None of the displaced businesses serve neighborhood retail or services needs. A Seattle Fire Station will also be temporarily displaced within the neighborhood.

These changes will not affect overall vehicular, transit, and pedestrian accessibility to the area. The substantial reduction in parking, however, will affect public perception of accessibility. In particular, this could affect businesses in the Pioneer Square area. The movement and interaction of people, both residents and workers, will likely change compared to existing conditions, though the pedestrian bridge located at Marion Street will be replaced. Restricting the use of the Battery Street and Western Avenue ramps could be perceived as an improvement in the immediate neighborhood. Long-term effects will be a mixture of both adverse effects and benefits to the neighborhood.

5.4.3 North Waterfront – Pike Street to Broad Street

In the north waterfront segment of the Aerial Alternative, the Alaskan Way surface street will be rebuilt in its existing footprint as described for the Rebuild Alternative. No property would be purchased in this segment. Peak traffic conditions will be very similar to current conditions in terms of the number of congested intersections and the duration of congestion on SR 99. Available parking spaces (net gain of 6 spaces) and pedestrian walkways will be very similar to current conditions. Direct access, general access, and travel patterns within this portion of the study area will remain unchanged. Potential effects on social resources will be similar as described for the north waterfront segment of the Rebuild Alternative and will not result in any adverse effects.

5.4.4 North – Battery Street Tunnel to Ward Street

BST Improvements and Widened Mercer Underpass

For the north segment of the Aerial Alternative, improvements will be made to the Battery Street Tunnel as well as the existing Mercer Street Underpass. The proposed alternative will include fire/life safety improvements to the Battery Street Tunnel. In particular, the tunnel will be lengthened at both ends to allow for installation of fans for improved ventilation. No improvements will generally be visible at street level between First Avenue and Denny Way. Support buildings will be constructed at the intersections of Western Avenue and Battery Street as well as at John Street and Aurora Avenue N. In addition, the existing Mercer Street underpass crossing of Aurora Avenue N. will be widened to three lanes in each direction, and a new bridge will be constructed at Thomas Street to facilitate traffic flow during the construction period and following construction.

Peak traffic conditions will be substantially congested compared to existing conditions. The number of congested intersections will increase from three to eight. The duration of congestion on SR 99, however, would be similar to current conditions. Parking will also be similar to current conditions, although an estimated 40 on-street spaces will be eliminated to construct the Thomas Street Bridge.

Population and Housing

No residential buildings will be acquired and few residents live in close proximity to the Aerial Alternative alignment in the north segment. The improvements will not affect many people. They will generally improve traffic access and congestion in the Uptown and South Lake Union neighborhoods. The new bridge at Thomas Street will decrease the physical obstruction effect and transportation access issues currently caused by the below-grade configuration of Aurora Avenue N. These changes will likely be perceived as benefits to residents of adjacent neighborhoods.

Community Facilities

There are no community facilities located within close proximity (one block) of the reconstructed portions of the Battery Street Tunnel, Aurora Avenue N., and Mercer Street. Direct access and general access to and from facilities that are distant from the SR 99 corridor are not expected to change substantially, as use of the arterials and local streets in the area is not expected to change substantially from existing conditions. The proposed widening of the Mercer Street underpass will improve traffic flow conditions in the area. Access to community facilities such as the Center School and Memorial Stadium located

in the Seattle Center complex will benefit from the proposed improvements to Mercer Street due to somewhat improved access to the neighborhood.

Religious Institutions

There are two religious institutions located within close proximity (one block) of the SR 99 alignment for the Aerial Alternative. No adverse effects are anticipated to these religious institutions long-term. The proposed widening of the Mercer Street underpass will improve general traffic flow and conditions in the area, which could benefit nearby religious institutions.

Social and Employment Services

The Aerial Alternative will include improvements to the existing Battery Street Tunnel. Emergency egresses will be constructed. One emergency egress structure will be constructed between Second and Third Avenues in the alley. Minor modifications to a building basement will also be required. Long-term use of the building will continue. A second egress will be constructed near the north portal. Here again, an existing building basement will undergo minor modifications to allow for construction of the egress. Current use of the buildings will continue and will not result in long-term adverse effects.

The Millionaire Club Charity is located near the south portal of the Battery Street Tunnel. This social service agency provides employment assistance to low-income persons. The proposed restricted (emergency use only) use of the existing Battery Street and Western Avenue ramps on SR 99 could potentially affect access to this social service. Other nearby ramps will continue to be operational, so adverse effects are not expected to substantially affect the services provided to clientele.

In the north segment, there are many other social and employment service providers within approximately five blocks of the project corridor. Proposed widening will improve traffic flow in the general area, which could benefit these providers and their clientele. Overall, the vehicular, transit, and pedestrian access will generally be very similar to current conditions.

Cultural and Social Institutions

There are many cultural and social institutions located within approximately five blocks of the alignment of the Aerial Alternative in the north segment. None, however, are located within close proximity (one block). Most are located at Seattle Center. Direct access and general access to and from these institutions are not expected to change under this alternative as all existing arterials and streets will continue to be used similar to current use patterns. The widening of the Mercer Street underpass, however, will provide some

benefit to persons traveling to and from cultural and social institutions located at the Seattle Center, especially as people drive east on Mercer Street to access either SR 99 or I-5 after performances.

Government Institutions

The Seattle Parks and Recreation Maintenance Division as well as the Seattle Public Schools administration offices are located in the north segment. Neither is located in close (one block) proximity of the alignment proposed for the Aerial Alternative. These facilities will not be affected by the proposed fire/life safety improvements proposed for the Battery Street Tunnel. Long-term access to and from the neighborhood will be improved somewhat following the construction of this alternative due to the proposed widening of the Mercer Street underpass and the construction of the new bridge at Thomas Street. Generally, though, traffic flow and conditions in the area will remain similar to current use for the Rebuild Alternative.

Neighborhood Cohesion

The Aerial Alternative in the north segment is somewhat similar to current conditions. Though one parcel will be purchased, there is no structure on the property. No businesses, residents, or workers will be displaced. The local street network and links to most existing community facilities and services will not change. The movement and interaction of people, both residents and workers, will be similar to existing conditions. Traffic on local intersections, however, will be more congested during peak traffic periods. Improvements to the Battery Street Tunnel will not be perceived as a change by the neighborhood and widening Mercer Street and construction of a new bridge over Aurora Avenue N. at Thomas Street will help increase movement between the two neighborhoods on either side of Aurora Avenue N. These changes will be seen as both adverse effects as well as benefits to the neighborhood.

Option: Lowered Aurora/SR 99

The proposed option in the north segment of the Aerial Alternative would include improvements to both the Battery Street Tunnel and the street grid in the South Lake Union area. Fire/life safety improvements would be made to the Battery Street Tunnel and the tunnel would be lengthened to install fans to improve ventilation. To accommodate traffic during construction and operation, Aurora Avenue N. would be lowered and several new bridges would be constructed over the roadway. These bridges would be constructed at Thomas, Harrison, Republican, Mercer, and Roy Streets. All would be four-lane structures, except Mercer Street would be six lanes. In addition, Broad Street would be closed from Fifth Avenue N. to Ninth Avenue N.

For this north segment option, the potential effects to social resources would be similar to those described above relating to the proposed Battery Street Tunnel improvements. The lowering of Aurora Avenue N. and the reconnection of four streets in the local street grid would result in much improved general circulation and flow of traffic in the area compared to the proposal to widen the Mercer Street underpass and add a new bridge at Thomas Street. The additional crossing will improve connectivity between the Uptown and South Lake Union neighborhoods. The benefits to traffic flow would especially be noticeable immediately following large events at the Seattle Center. The capacity of Mercer Street would be increased and the four additional bridges across Aurora Avenue N. would allow traffic to disperse more freely in the neighborhood, rather than channel traffic onto Mercer Street. These benefits would provide improved general access to and from area housing, community facilities, religious and cultural/social institutions, social and employment agencies, and government institutions in the area.

5.4.5 Seawall – S. King Street to Myrtle Edwards Park

Seawall Rebuild

For the Aerial Alternative, the existing seawall will be rebuilt from S. King Street to Virginia Street. No properties will be acquired for this work. This is the same conceptual engineering design as proposed for the Rebuild Alternative. A new seawall will be placed in a very similar alignment as the existing seawall. It will be below the level of the roadway pavement and therefore will not be visible to passersby. The resulting effects on social resources will be the same as described for the Rebuild Alternative and are not expected to cause adverse effects to social resources long-term.

Option: Seawall Frame

The option to rebuild the existing seawall would involve construction of a new structure using a frame design. A continuous secant wall and a bulkhead would be constructed landward of the existing seawall. The existing structures would be removed. These improvements are not proposed to occur between S. King Street and S. Washington Street. Like the rebuilding of the existing seawall, a new seawall would be in nearly the same alignment and configuration as the existing structure. Potential effects on social resources would be the same as described earlier for the Rebuild Alternative. As such, the different engineering design for a new seawall is not expected to cause any adverse effects on social resources.

5.5 Tunnel Alternative

The Tunnel Alternative includes both the proposed engineering concept as well as an option for the south segment. Under this alternative, a new seawall will be mostly reconstructed using the constructed wall of the roadway tunnel to function as the seawall from S. King Street to Virginia Street. From Virginia Street north to Myrtle Edwards Park, the seawall will be rebuilt similar to the Rebuild Alternative. There is no seawall option for the Tunnel Alternative. The potential social impacts associated with the alternative and south segment option are evaluated below.

5.5.1 South – S. Spokane Street to S. King Street

SR 99 At-Grade With SR 519 Elevated Interchange

In the south segment, the Tunnel Alternative will involve the replacement of the existing roadway with a new at-grade roadway north of S. Hanford Street. Much of the new roadway will be in the same alignment as the existing roadway. The new six-lane roadway, however, will be west of the existing roadway near S. Holgate Street to allow combining of the Whatcom Rail Yard and the BNSF SIG Rail Yard. Ramps will ascend from the at-grade roadway to provide access to an elevated SR 519. This design concept is similar to the proposed alternative for the Rebuild Alternative except the roadway descends and enters the tunnel before S. King Street.

Peak traffic conditions will be somewhat more congested than current conditions with an increase from zero to three moderately congested intersections. The duration of congestion on SR 99, however, would be similar to current conditions—approximately 3 to 4 hours per day. The availability of parking spaces in the stadium area, however, will be less than current conditions. There will be approximately 231 spaces, or a 28 percent loss of available spaces. All long-term on-street spaces will be eliminated, though there will be an increase of 27 short-term, on-street spaces.

Population and Housing

Access to residential development and traffic patterns for the south segment of the Tunnel Alternative will be similar to current conditions. Traffic associated with proposed ramps will be similar to current conditions. The lack of downtown ramps in the central segment, however, will likely cause traffic volume increases in the vicinity of S. Atlantic Street, S. Royal Brougham Way, and S. King Street as traffic exits SR 99 at the south end of downtown and uses local surface streets to reach downtown destinations. Vehicle and pedestrian access to the St. Martin de Porres Shelter will change due to the new SR 519 ramps and frontage roads. Traffic congestion will also increase in

the vicinity of the shelter, which could increase the difficulty of vehicles leaving the facility and merging into Alaskan Way surface street traffic. The change in travel patterns is not expected to cause substantial adverse effects on the few residents living in the south segment.

Community Facilities

The John Stanford Center for Educational Excellence is not located in close proximity to the Tunnel Alternative alignment. Direct access and general travel patterns are not anticipated to change, so no adverse effects will occur.

Religious Institutions

No religious institutions are located in the south segment, so there will be no long-term effects on such facilities.

Social and Employment Services

The proposed new DSHS halfway house and the Salvation Army Adult Rehabilitation Center are several blocks from roadway improvements proposed as part of the Tunnel Alternative. They will not be directly affected by this alternative long-term. General vehicular, transit, and pedestrian access to these facilities and the general pattern of traffic are not expected to change in the vicinity of these facilities. No adverse effects will occur.

Cultural and Social Institutions

Cultural and social institutions located in the south segment include the Seahawks Stadium, Safeco Field, Stadium Exhibition Center, and the U.S. Coast Guard Museum of the Northwest. As described for the Rebuild Alternative, these facilities are clustered in the vicinity of the proposed new grade-separated SR 519 ramps. The new ramps will likely be used to access to these facilities. Traffic patterns before and after sports events will be different from current conditions, and the duration of associated congestion will generally lessen. General vehicular, transit, and pedestrian access to these facilities from local streets will not change. Parking in the area will be reduced by 231 parking spaces, but the number of spaces lost will not likely be a substantial number compared to the total number of sports fans attending stadium events. Overall, no substantial adverse effects are expected to affect these facilities under the Tunnel Alternative.

Though no substantial traffic changes will exist in this segment of the Tunnel Alternative from current conditions, the northern end will descend into the proposed new tunnel. This change will affect the route of regional charity runs, which currently start at the Safeco Field and incorporate portions of the existing elevated roadway. Participants would no longer be able to walk and run on the Alaskan Way Viaduct, which offers opportunities for pedestrians

to view Elliott Bay. Changing the route to include the new tunnel or an alternative route will likely be a disappointment to participants. Other routes, however, could be developed to attract similar numbers of participants.

Government Institutions

The U.S. Coast Guard facility located at Pier 36 is the only major government facility in this segment, except for Terminal 46. New ramps connecting SR 99 and SR 519 will occur east of the facility, and these changes will have similar effects to those described for the Rebuild Alternative. Neither direct access nor general travel patterns in the vicinity of this facility will change substantially in the future, so no adverse effects are expected.

Neighborhood Cohesion

Like the Rebuild Alternative, the Tunnel Alternative in the south segment will be similar to current conditions of street network and links to existing community facilities and services. This change will not adversely affect accessibility to this area. Four structures will be acquired for right-of-way, but they are non-residential. This property acquisition would displace an estimated 193 jobs, which is a very small number compared to the number of workers employed in the Duwamish industrial area. None of the displaced businesses provide retail or services to the surrounding neighborhood. The reduction in parking spaces could affect movement and interaction of people in the stadium area, even though few residents or retail businesses are located in this segment. The demolition of the elevated structure in the north end of the south segment for construction of the tunnel will remove a visual obstruction between the waterfront and adjacent upland land uses. This could be perceived as a potential benefit to neighborhood cohesion. Overall, no long-term adverse effects will occur to neighborhood cohesion.

Option: Side-by-Side Aerial With SR 519 At-Grade

The option for the south segment of the Tunnel Alternative is construction of an at-grade structure that would transition to a new aerial structure. Between S. Hanford Street and S. Holgate Street, the roadway would be at-grade primarily in the same alignment as the existing roadway. Near S. Holgate Street, the alignment would be west of the existing alignment to allow combining the existing Whatcom Rail Yard and BNSF SIG Rail Yard. The roadway would transition into an aerial structure over S. Atlantic Street, S. Royal Brougham Way, and over the BNSF SIG Rail Yard. Ramps would descend from SR 99 to provide access to the new at-grade SR 519.

This option would be similar to the proposal for the south segment of the Aerial Alternative. The exception is that before reaching S. King Street, the roadway would descend into the tunnel. The potential effects to social

resources would be nearly the same as described above for the Aerial Alternative. No community facilities, religious or cultural/social institutions, social service agencies, or government institutions are located in close proximity to this northern portion of the south segment except for the U.S. Coast Guard and Terminal 46. As such, no adverse effects would occur following construction of this option.

5.5.2 Central – S. King Street to the Battery Street Tunnel

Tunnel With No Ramps at Elliott and Western Avenues

For the central segment of the Tunnel Alternative, an underground tunnel structure is proposed. Near S. King Street, the roadway will descend into a six-lane tunnel. The tunnel will continue north in the existing Alaskan Way surface street right-of-way. The north portal of the tunnel will be near Pine Street. At this point, the roadway will transition into a short aerial structure to provide adequate vertical clearance over the existing BNSF railroad tracks and Elliott and Western Avenues. The aerial roadway will then descend and enter the Battery Street Tunnel. The tunnel configuration will not have ramps at Columbia and Seneca Streets or at Western and Elliott Avenues. New on- and off-ramps to Alaskan Way surface street, however, will be constructed near Pike Street. The existing on- and off-ramps at Battery Street and Western Avenue will be closed except for emergency access.

Peak traffic conditions will be somewhat less congested than current conditions with a reduction from seven to five congested intersections. The duration of congestion on SR 99 would be similar to current conditions. This alternative will substantially reduce the availability of parking spaces in both the Pioneer Square and central waterfront areas. There will be a loss of approximately 128 spaces, or 68 percent, of parking in the Pioneer Square area (almost entirely short-term, on-street spaces) and a loss of 297 spaces, or 46 percent, in the central waterfront area (approximately 218 short-term, on-street spaces and 79 off-street spaces).

Population and Housing

Access to residential development and traffic patterns for the central segment of the Tunnel Alternative will be different from current conditions. Existing ramps at Columbia and Seneca Streets and Elliott and Western Avenues will no longer exist, but new ramps will be constructed from the tunnel near Pike Street. In addition, the use of the existing Battery Street and Western Avenue ramps to SR 99 will be restricted to emergency use only. Generally, traffic congestion and noise levels along the waterfront will decrease markedly as much of the existing viaduct traffic will be using the underground tunnel. Traffic, however, will increase on surface streets in the north end of the central

segment as traffic exits SR 99 to reach downtown destinations. Traffic volumes on Elliott and Western Avenues and First Avenue are expected to decrease, which will likely be perceived as an improvement to current conditions for surrounding residents living.

Vehicle and pedestrian access to the Bread of Life Mission and the Compass Center could improve due to the new SR 519 ramps south of these facilities. Pedestrian access also will improve due to lower traffic volumes on Alaskan Way surface street in the immediate vicinity of these facilities. The addition of new ramps near Pike Street from the proposed tunnel ramp to Alaskan Way surface street, however, will increase traffic noise (though not substantially) on Alaskan Way surface street due to increased traffic volumes and acceleration up the tunnel ramps. For additional information, please see Appendix F, Noise and Vibration Discipline Report. These changes will deteriorate the surrounding environment for pedestrians along the waterfront. In effect, this alternative shifts traffic and noise locations adjacent to the existing ramps to the new ramp locations. This will be seen as deterioration in the residential environment for inhabitants of Waterfront Landing (235 condominiums). The overall effects will likely be perceived as adverse effects by residents generally in the north end of the central segment, and especially for residents along Alaskan Way surface street.

Community Facilities

Childcare facilities, public schools, technical schools, and a university branch campus are all located in the central segment. No facilities are located within close proximity of the proposed alignment of the Tunnel Alternative. General travel patterns will change, as the tunnel design will not include several existing ramps to the downtown area. Traffic will need to exit SR 99 at either the south or north end of the downtown area and use surface streets to access community facilities. Travel routes and travel times to and from community facilities will change, but will not likely change substantially.

Religious Institutions

The several religious institutions located in the central segment are generally located more than two blocks away from proposed road improvements associated with the Tunnel Alternative. General vehicular and transit access to the facilities will change because of the elimination of some downtown ramps. Travel routes will change and travel times will lengthen. The change will not be considered an adverse effect, especially considering travel to these institutions is not likely an everyday occurrence.

Social and Employment Services

There are many social and employment services located in this portion of the project corridor, which are required to meet the daily needs of low-income and disadvantaged residents in downtown Seattle. None of the existing social and employment services (exclusive of emergency or special needs housing services) are located immediately adjacent to proposed improvements associated with the Tunnel Alternative. Direct street access and the adjacent street network access to buildings containing social and employment service providers will not change. Changes in access due to the reduction in downtown ramps from SR 99 will generally not affect clients of social and employment services because they are mostly reliant upon public transit and walking. Vehicle access will also change, but not substantially, for social service volunteers and/or visitors.

The elimination of several downtown ramps will change routes for some potential employers who might hire workers through social services located in the area. The proposed road improvements, however, will not differ substantially from existing conditions of the local street network, so access between service providers will not be affected.

Cultural and Social Institutions

Many cultural and social institutions are located in the central segment, but most are located several blocks away from roadway improvements proposed for the Tunnel Alternative. Direct access to these institutions will be similar to current conditions. Under this alternative, however, the only ramps providing access to downtown Seattle will be near Pike Street. Traffic to downtown cultural institutions such as the art museum, symphony hall, and theatres will need to exit SR 99 either to the south or north of downtown and use local surface streets to access these institutions. This will generally increase traffic congestion both north and south of the downtown area and will increase travel time slightly. This will be a change from existing conditions, but will not likely be an adverse effect considering visits to these institutions often occur during non-peak traffic periods. No adverse effects to cultural and social institutions are expected under the Tunnel Alternative.

Government Institutions

As described above for the Rebuild Alternative, many City of Seattle, King County, Washington State, and federal government office buildings are located in the central segment. Except the Colman Dock Ferry Terminal at Pier 52, no direct street access will change for any of these facilities under the Tunnel Alternative. In addition, local traffic access to these buildings will not change. Access to these facilities from outside of the Seattle downtown area,

however, will change due to the elimination of some downtown ramps. Traffic will need to exit SR 99 at either the south or north end of the downtown area and use local surface streets to access these government facilities. This change could be seen as substantial for some individuals, especially those who drive to work at one of these office buildings on a daily basis. The Flexible Transportation Package proposed as part of all Build Alternatives will help mitigate any perceived adverse effects. For additional information, please see Appendix C, Transportation Discipline Report.

Roadway access to the Colman Dock Ferry Terminal (Pier 52) will occur under the Tunnel Alternative similar to changes described above for the Rebuild Alternative. The historic Washington Street Boat Landing will be relocated to the western end of Pier 46. These changes would not be considered adverse effects.

Neighborhood Cohesion

The Tunnel Alternative in the central segment will be quite different from current conditions. The construction activities will require the acquisition of 12 parcels with 6 non-residential structures. Together, these displacements could affect an estimated 162 jobs, a small proportion of area jobs. Of the several businesses that will be displaced, one is a restaurant and the other is an antiques business. The loss of these local businesses could be perceived as an adverse effect by local residents. In addition, a fire station will be displaced.

The displaced local street network and links to most existing community facilities and services will not change. The substantial reduction in parking, however, will change perceptions of accessibility to certain neighborhoods. The movement and interaction of people, both residents and workers, would likely change. The demolition of the elevated structure along the waterfront and the construction of a tunnel will also reduce both traffic volumes and noise levels on the Alaskan Way surface street.

Demolition will also remove a major physical and visual obstruction separating the waterfront from the rest of the downtown. Removal of the structure will also remove the shadowing effect created by the existing large structure. (For additional discussion of visual effects, please see Appendix D, Visual Quality Technical Memorandum.) These changes will likely be seen as a benefit and will likely encourage people to walk down to the waterfront, thus reducing some of the current isolation of the waterfront area from the Commercial Core. Pedestrian access to the waterfront will be similar to existing conditions as the existing number of pedestrian bridges will be maintained.

In the north end of the central segment, however, changes in ramps to SR 99 will generally increase traffic, congestion, and noise. Streets that previously provided access to SR 99 ramps will no longer be used, but new ramps at Pike Street will create new disruptions to a portion of the waterfront that was previously not in close proximity to traffic congestion or noise generated by viaduct traffic.

In conclusion, the proposed Tunnel Alternative could lead to improved neighborhood cohesion in the south and central portions of the central segment, but will likely create new adverse effects on neighborhoods in the north end of the central segment. The overall effect of the Tunnel Alternative on neighborhood cohesion in the central segment will be mixed.

Option: Tunnel With Ramps at Elliott and Western Avenues

The option for the central segment of the Tunnel Alternative would be very similar to the tunnel configuration described above for this alternative. Instead of ramps at Pike Street, however, ramps would be constructed at Elliott and Western Avenues similar to current conditions. The overall adverse effects on social resources would be less than expected under the alternative.

Residents in the north end of this segment would experience a slight increase in traffic congestion and noise. Maintaining ramps at Elliott and Western Avenues would not result in a shift in traffic and noise impacts to Alaskan Way surface street and the neighborhood. Conditions for residents of the Waterfront Landing condominium complex would likely be similar to current conditions. General access to downtown community facilities, social and employment service agencies, religious and cultural/social institutions, and government institutions would change due to the reduction of downtown ramps. These changes would continue to result in a mix of adverse and beneficial effects.

5.5.3 North Waterfront – Pike Street to Broad Street

In the north waterfront segment of the Tunnel Alternative, Alaskan Way surface street will be improved from Pike Street to Broad Street. No acquisition of right-of-way will be required. There will be no effects on social resources. The roadway improvements will accommodate ramps from the tunnel ascending to provide access to the Alaskan Way surface street. These ramps will be constructed between approximately Union and Lenora Streets. The proposed configuration of the ramps could change the access and use of local streets in the immediate vicinity of the new ramps. No other changes are proposed. Peak traffic conditions will be slightly more congested for this alternative compared to current conditions. One intersection will be

congested on a regular basis, though the duration of congestion on SR 99 will be similar to current conditions. Available parking spaces and pedestrian access will be similar to current conditions with a net loss of 14 parking spaces.

Population and Housing

As described above for the central segment, the new tunnel ramps near Pike Street will generally be expected to cause an increase in traffic congestion and associated noise for residents. A more substantial change will be experienced by residents along the Alaskan Way surface street. The traffic congestion and acceleration of vehicles emerging from the tunnel ramp to the Alaskan Way surface street will increase noise levels. These effects, however, will not exceed FHWA noise abatement criteria. These changes will likely be perceived as a deterioration in the quality of life for residents in the south end of the north waterfront segment, particularly those residing at the Waterfront Landing condominium complex.

Community Facilities

The Art Institute of Seattle, located at 2600 Alaskan Way, is adjacent to proposed improvements to Alaskan Way surface street under the Tunnel Alternative. This location is north of the proposed tunnel ramps, so this community facility is not likely to be affected by the proposed improvements. No other community facilities are located in the north waterfront section of this alternative.

Religious Institutions

There are no religious institutions located in the north waterfront.

Social and Employment Services

There are no social or employment service organizations located along Alaskan Way surface street in the north waterfront.

Cultural and Social Institutions

The Seattle Aquarium is located on the west side of the Alaskan Way surface street at Pier 59. This site is located between Union and Pike Streets. The close proximity of the aquarium to the Alaskan Way surface street and the ramps from the proposed tunnel may require some modification for direct access to the facility. Appropriate access, however, will be ensured as part of the proposed AWW Project for the long-term operation of the Seattle Aquarium. The Odyssey Maritime Discovery Center is located further to the north on Pier 66 and is not expected to experience any substantial changes to general vehicular, transit, or pedestrian access.

Government Institutions

There are only two government institutions located in the north waterfront. The Port of Seattle cruise ship terminal and headquarter offices are both located at Pier 69. This is considerably north of the proposed tunnel ramps. Direct access and general travel routes using local streets are not expected to be affected by this alternative.

Neighborhood Cohesion

The Tunnel Alternative in the north waterfront will be quite different from current conditions. No property will be acquired. The existing SR 99 ramps on Elliott and Western Avenues will not be replaced, and the Battery Street and Western Avenue ramps will be restricted for emergency use only. In their place, new ramps to the tunnel will be constructed between Union and Lenora Streets. The local street network and links to many existing community facilities and services will change. Public perception of the accessibility of this neighborhood is not expected to change, even though access could be more circuitous. Existing streets could become relatively quiet due to decreases in traffic congestion, and currently quiet streets could become busy due to changes in tunnel on- and off-ramps. This portion of the waterfront is a popular place for pedestrians to walk. Congestion from vehicles exiting and entering SR 99 will likely deteriorate the quality of such trips. The changes could also be viewed as adversely affecting the quality of life for residents along the Alaskan Way surface street. All together, these changes will likely be considered mixed effects in the north waterfront section of the Tunnel Alternative.

5.5.4 North – Battery Street Tunnel to Ward Street

In the north segment of the Tunnel Alternative, fire/life safety improvements will be made to the Battery Street Tunnel, and the existing Mercer Street underpass crossing Aurora Avenue N. will be widened as described for the Aerial Alternative. Thomas Street will be reconstructed as a bridge crossing over Aurora Avenue N. to maintain traffic flow during construction activities to widen Mercer Street. These are the same improvements proposed for the Aerial Alternative. Peak traffic conditions will be substantially more congested, with the number of moderately congested intersections increasing from three to seven. The duration of congestion on SR 99, however, would continue to be similar to current conditions. Parking availability will be similar to current conditions, although an estimated 40 on-street spaces would be eliminated due to construction of the Thomas Street bridge.

Right-of-way acquisition will require the purchase of one parcel that is currently used as a parking lot. The displacement of this business will affect

only a few jobs. In addition, minor modifications to two buildings adjacent to the Battery Street Tunnel will be required for construction of egresses. The proposed modifications will not affect existing uses in either building. The change in vehicular access routes to these facilities is not expected to be substantial, though travel times could increase somewhat. Proposed Mercer Street underpass improvements will provide some improvement to the general flow of traffic in the area. This improvement will generally provide improved access for housing, community facilities, religious and cultural/social institutions, social and employment service providers, and government institutions in the area. These effects will be the same as described earlier in more detail for the Aerial Alternative.

5.5.5 Seawall – S. King Street to Myrtle Edwards Park

For the Tunnel Alternative, a new seawall will be reconstructed without the need to acquire any additional property. The outside wall of the underground tunnel structure for the roadway will function as a seawall generally from S. Washington Street to Union Street. From Pier 48 (near S. Main Street) to S. Washington Street and from Union Street to Myrtle Edwards Park, the seawall will be rebuilt except for a small portion recently reconstructed at the Cruise Ship Terminal at Pier 69. The rebuilding of the seawall between Union Street and Myrtle Edwards Park will be the same as described for the Rebuild Alternative.

Like the rebuilding of the existing seawall and the proposed reconstruction of the seawall using a frame design, the proposed seawall under the Tunnel Alternative will be in nearly the same alignment and configuration as the existing seawall. Potential effects on social resources will be the same as described for the Rebuild Alternative. As such, differences in engineering design for the proposed seawall will not cause adverse effects on social resources.

5.6 Bypass Tunnel Alternative

5.6.1 South – S. Spokane Street to S. King Street

In the south segment of the Bypass Tunnel Alternative, an at-grade roadway will replace the existing SR 99. The roadway will be at-grade north of S. Hanford Street, and the alignment will be west of the existing roadway to accommodate the combining of Whatcom Rail Yard and the BNSF SIG Rail Yard. SR 519 will be elevated. This portion of the south segment is the same as proposed for the Rebuild Alternative. The SR 99 through traffic, however, will continue north at-grade and then will descend into the bypass tunnel

near S. Dearborn Street. At S. King Street, the SR 99 traffic to midtown will be routed to ramps to the Alaskan Way surface street.

Peak traffic congestion will be somewhat more congested with an increase from zero to three congested intersections. The duration of congested traffic conditions on SR 99, however, will increase from approximately 4 to 5 hours per day. Available parking spaces in the stadium area will be reduced. There will be a 28 percent loss of parking spaces, or approximately 231 spaces (almost entirely long-term, on-street spaces).

Population and Housing

In the south segment, access to residential uses and traffic patterns of the Bypass Tunnel Alternative will be similar to existing conditions. Traffic associated with proposed ramps will be similar to current conditions. As with the Tunnel Alternative, the lack of downtown ramps in the central section will likely cause traffic volume increases in the vicinity of S. Atlantic Street, S. Royal Brougham Way, and S. King Street. Traffic will exit SR 99 at the south end of downtown to use local surface streets to reach downtown destinations. Vehicular and pedestrian access to and from the St. Martin de Porres Shelter could be affected. Traffic flow will change due to the new SR 519 ramps and the new frontage roads. In turn, these changes may increase traffic congestion in proximity of the shelter, which could make it more difficult for vehicles to leave the facility and turn into Alaskan Way surface street traffic. Overall, these changes in travel patterns and congestion are not expected to cause adverse effects on the few residents living in the south segment.

Community Facilities

The John Stanford Center for Educational Excellence is not located in close proximity to the alignment of the Bypass Tunnel Alternative. Direct access and general travel patterns are not anticipated to change. No adverse effects will occur.

Religious Institutions

No religious institutions are located in the south segment. No impacts would occur.

Social and Employment Services

The proposed new DSHS halfway house and the Salvation Army Adult Rehabilitation Center are several blocks from roadway improvements proposed as part of the Bypass Tunnel Alternative and will not be directly affected long-term. Direct access to these facilities and the general pattern of

traffic are not expected to change in the vicinity of these facilities. No adverse effects will occur.

Cultural and Social Institutions

Cultural and social institutions located in the south segment include the Seahawks Stadium, Safeco Field, Stadium Exhibition Center, and the U.S. Coast Guard Museum of the Northwest. The new SR 519 ramps will likely be used to access these facilities from SR 99. Traffic patterns and volumes on area streets before and after sports events will be different from current conditions. Because the Bypass Tunnel Alternative does not include access ramps to downtown Seattle, the general congestion in this portion of the project corridor could exacerbate heavy traffic conditions following large sport events. Traffic that historically used downtown exits will need to use the new SR 519 ramps or existing ramps north of Denny Way. The reduction in available parking spaces is not expected to result in adverse effects in the south segment considering the reduction is small compared to thousands of sports fans attending stadium events. Overall, no adverse effects are expected for these facilities under the Bypass Tunnel Alternative.

The northern end will descend into a new tunnel for the Bypass Tunnel Alternative. This change will affect the route of regional charity runs, which currently incorporate portions of the existing elevated Alaskan Way Viaduct. Participants will no longer be able to experience the opportunity to view Elliott Bay currently afforded by these events. Other routes, however, could be developed to attract similar numbers of participants.

Government Institutions

Other than Terminal 46 (discussed above), the U.S. Coast Guard facility located at Pier 36 is the only other major government institution located in the south segment. New grade-separated ramps connecting SR 99 and SR 519 will be constructed east of the facility. The ramps to access the new bypass tunnel from the Alaskan Way surface street will be constructed to the north of the U.S. Coast Guard facility. As such, neither direct access nor general travel patterns in the vicinity of this facility will change substantially in the future. Congestion will likely increase in the vicinity of the government facilities as the Bypass Tunnel Alternative does not include ramps to access downtown Seattle. Traffic that previously used downtown ramps will need to exit either to the north or the south of downtown, including the new SR 519 ramps. Overall, no adverse effects are expected.

Neighborhood Cohesion

Like the Tunnel Alternative, the Bypass Tunnel Alternative in the south segment will be similar to current conditions in terms of street network and

links to existing community facilities and services. Only four structures will be acquired, but no locally servicing businesses. An estimated 193 jobs will be displaced, but this is very small considering the very large number of workers employed in the Duwamish industrial area.

The movements and interaction of residents and workers will be similar to existing conditions. The demolition of the elevated structure in the north end of the south segment for construction of the tunnel will remove a visual obstruction between the waterfront and adjacent upland land uses. This could be perceived as a benefit to neighborhood cohesion. The slight increase in traffic congestion and reduction in parking spaces could affect perceived accessibility to neighborhood residents and shops. Long-term effects to neighborhood cohesion will likely be mixed.

5.6.2 Central – S. King Street to the Battery Street Tunnel

Bypass Tunnel With Ramps at Elliott and Western Avenues

The Bypass Tunnel Alternative will consist of an underground tunnel structure along the waterfront. To provide adequate vertical clearance over the existing railroad tracks and Western and Elliott Avenues, the tunnel structure will transition into a short aerial structure similar to the proposed structure in the Aerial Alternative. Crossing over the railroad tracks, the aerial structure will descend into the Battery Street Tunnel. As with the Tunnel Alternative, no on- or off-ramps will connect the tunnel to Columbia and Seneca Streets or Elliott and Western Avenues. In contrast to the Tunnel Alternative, this alternative will not have ramps constructed near Pike Street. The existing on- and off-ramps at Battery Street and Western Avenue will be closed except for emergency access use.

Peak traffic conditions for this alternative will be somewhat less congested with two fewer intersections considered congested. The peak period of congestion of SR 99, however, will increase from approximately 4 to 5 hours per day. This alternative will also have a substantial decrease in available parking spaces. There will be a 79 percent loss, or 148 parking spaces, in the Pioneer Square area (almost all short-term, on-street spaces) and a 52 percent loss, or 337 spaces, in the central waterfront area (69 percent short-term on-street spaces and 30 percent off-street spaces).

Population and Housing

Potential effects on population and housing in the central segment of the Bypass Tunnel Alternative will be similar to those described for the Tunnel Alternative. Traffic and noise levels along the waterfront will be slightly higher than for the Tunnel Alternative, but not as high as for the other

alternatives. Increased traffic congestion and noise levels will be experienced by residents in the north end of the central segment due to the reduction in downtown ramps. This change could affect overall vehicular travel times to and from the Bread of Life Mission and the Lutheran Compass Center (Friedhoff 2003). Overall, the changes may be perceived as an adverse effect on the residential environment, especially in the north end of the central section near the Waterfront Landing condominiums.

Community Facilities

As described above for the Tunnel Alternative, there are many childcare facilities, public schools, technical schools, and a university branch campus located in the central section. The roadway improvements proposed for the Bypass Tunnel Alternative will not require modifications to street access to any of these facilities, nor will local street access be altered. General travel patterns, however, will change as the Bypass Tunnel Alternative has fewer ramps to downtown compared to existing conditions. Traffic will need to exit SR 99 at either end of downtown and use surface streets to access community facilities. Travel routes to and from these facilities will change, but travel time will not likely change substantially.

Religious Institutions

There are several religious institutions located in the central section, but most are generally located more than two blocks away from proposed road improvements associated with the Bypass Tunnel Alternative. This alternative does not include ramps to downtown Seattle. Driveway access to the facilities will not change, but travel routes to the religious institutions will need to exit SR 99 either to the south or north of downtown and use local streets to access these institutions. This change is not likely to be considered an adverse effect, especially considering that travel to these institutions is not usually an everyday occurrence.

Social and Employment Services

As described above for the Tunnel Alternative, there are many social and employment services located in the central section. None of the existing service providers (exclusive of emergency or special needs housing services) are located immediately adjacent to proposed improvements associated with the Bypass Tunnel Alternative. Direct street access and the street network access to buildings containing service providers are not expected to change. Access to and from SR 99 will change considerably, especially considering the bypass tunnel will have a reduced number of downtown ramps. This will likely be perceived as a substantial change and adverse effect to many.

For clients of the social and employment services located in the area, pedestrian and bus access to these services will not likely change substantially. The reduction in number of downtown ramps will change access for some potential employers who might hire day workers from service providers, such as the Millionaire Club Charity. The proposed road improvements, however, will not differ substantially from existing local street network conditions. As such, access between service providers will not likely be affected. The reduction in parking, however, will change and could deter persons from continuing to volunteer with a particular service provider, which could result in hardships to non-profit organizations.

Cultural and Social Institutions

Many cultural and social institutions are located in the central segment, but all are located several blocks away from roadway improvements proposed for the Bypass Tunnel Alternative. Driveway access to these institutions will be the same as current conditions. Under this alternative, however, traffic using SR 99 will need to exit either to the south or north of downtown to drive to downtown cultural and social institutions. Traffic destined to these institutions will need to use local surface streets, which will increase travel time somewhat. This will be a substantial change from existing conditions, but will not likely be seen as a substantial adverse effect considering that attendance of cultural performances and social events is not an everyday occurrence. In addition, visits to these institutions often occur during non-peak traffic periods. No adverse effects to cultural and social institutions are expected under the Bypass Tunnel Alternative.

Government Institutions

A number of City of Seattle, King County, Washington State, and federal government office buildings are located in downtown Seattle in the central segment. Except the Colman Dock Ferry Terminal at Pier 52, driveway access will not change for any of these facilities. In addition, general vehicular and transit access to these buildings will not change. Access to these facilities from outside the Seattle downtown area, however, will change due to the reduction of downtown ramps. Traffic will need to exit SR 99 at either the south or north end of downtown and use local surface streets to access government facilities. This change in travel route and time potentially could be seen as substantial for some individuals, especially those who drive or carpool to work at one of these office buildings on a daily basis. The proposed Flexible Transportation Package will help mitigate any perceived adverse effects. See Appendix B, Alternatives Description and Construction Methods Technical Memorandum and Appendix C, Transportation Discipline

Report for additional detailed information on the Flexible Transportation Package.

Specific roadway changes and access to the Colman Dock Ferry Terminal (Pier 52) will be similar to those changes described above for the Rebuild Alternative. The historic Washington Street Boat Landing will be relocated to the western end of Pier 46. Effects on government institutions will be mixed.

Neighborhood Cohesion

Potential effects on neighborhood cohesion for the central segment of the Bypass Tunnel Alternative will be similar to those described for the Tunnel Alternative. A total of 12 parcels, six structures, and approximately 162 jobs would be displaced. Two businesses, a restaurant and an antiques business, serve the local neighborhood and elsewhere. The waterfront fire station will be displaced. As the tunnel only accommodates through traffic in the downtown core, traffic volumes and noise will be higher on Alaskan Way surface street than for the Tunnel Alternative. The removal of the elevated structure could attract increased numbers of residents and workers to the waterfront due to the lack of the visual obstruction and removal of the shadowing effect caused by the existing structure. The substantial reduction in parking could adversely affect local businesses, especially those in the Pioneer Square area, and the waterfront cultural institutions. Pedestrian access will be similar to existing conditions, especially considering that all existing pedestrian bridges over Alaskan Way surface street will be maintained. The reduction in downtown ramps will likely be perceived as an adverse effect in the northern portion of the central segment. Overall, effects will be mixed.

Option: Bypass Tunnel With Armory Way

The Bypass Tunnel Alternative Armory Way option will be similar to the alternative described above, except the on- and off-ramps at Western and Elliott Avenues would be maintained similar to existing conditions. The potential effects on social resources would be similar to those described for the Tunnel Alternative option in the central segment. Southbound traffic would generally exit SR 99 at the north end of downtown to access downtown destinations due to the lack of downtown ramps. This would generally increase traffic congestion and noise levels, especially in the north end of the segment. The overall effects would likely be adverse.

5.6.3 North Waterfront – Pike Street to Broad Street

To accommodate on- and off-ramps connecting the bypass tunnel and Alaskan Way surface street, this alternative will require improving Alaskan

Way surface street between Pike and Broad Streets, but no additional right-of-way will need to be purchased. The proposed ramps will be similar to those proposed for the Tunnel Alternative, except there will be no ramps at Pike and Pine Streets. No other changes are proposed in this segment. Peak traffic conditions will be slightly more congested with one intersection now operating under congested conditions during peak traffic times. The duration of congestion on SR 99 will also increase from approximately 4 to 5 hours per day. There will be a net increase of 6 parking spaces.

Population and Housing

As described above for the central segment, the loss of downtown ramps is expected to generally cause a slight increase in traffic congestion as traffic volumes in the bypass tunnel will only meet the needs of through traffic volumes. Vehicular access to downtown will have to use local streets. This may increase travel time and will likely be perceived as deterioration in the quality of life for residents in the south end of the north waterfront segment.

Community Facilities

The Art Institute of Seattle is the only community facility located along Alaskan Way surface street in the north waterfront. Direct and general access to this facility is not expected to change following construction of this alternative.

Religious Institutions

There are no religious institutions located on Alaskan Way surface street, so there will be no effects to these uses in the north waterfront.

Social and Employment Services

No social or employment services are located on Alaskan Way surface street in the north waterfront. No adverse effects will occur.

Cultural and Social Institutions

The Seattle Aquarium and the Odyssey Maritime Discovery Center are both located on Alaskan Way in the north waterfront. The improvements to Alaskan Way surface street and increases in traffic associated with the Bypass Tunnel Alternative could affect direct access from Alaskan Way surface street to these institutions. Slight modifications to driveways and entrances may be needed. Appropriate long-term access, however, will be guaranteed to both facilities as part of construction mitigation for this project.

Government Institutions

The Port of Seattle cruise ship terminal and headquarter offices are located at Pier 69. Direct access as well as general access to and from local streets will not be affected long-term by the construction of the Bypass Tunnel Alternative.

Neighborhood Cohesion

The likely effects on neighborhood cohesion in the north waterfront area with the Bypass Tunnel Alternative are similar to those described above for the Tunnel Alternative. No property will need to be acquired. Traffic congestion may be worse. Traffic patterns will change considerably, pedestrian movement of residents could change, and access to community facilities will also be altered. These changes may be perceived to deteriorate the overall cohesion of the neighborhood.

5.6.4 North – Battery Street Tunnel to Ward Street

In the north segment of the Bypass Tunnel Alternative, improvements will be made to the Battery Street Tunnel, and Mercer Street will be widened. This construction will require right-of-way acquisition. The proposed fire/life safety improvements and ventilation improvements will be the same as those described for the Aerial and Tunnel Alternatives. The proposal to widen Mercer Street into a six-lane underpass and construction of a new four-lane bridge at Thomas Street will also be the same as described above.

The Bypass Tunnel Alternative will require purchase of one parcel, no structures, and a parking lot business. As described earlier, construction of the two emergency egresses will require minor basement modifications of two buildings, but existing uses will not be affected long-term. The existing Battery Street and Western Avenue ramps will no longer be available for general use, and this may require potential employers of day laborers at the Millionaire Club Charity at Wall Street and Western Avenue change their normal route to access the pick-up spot for the workers. These types of changes would result in mixed effects.

As described above for the Aerial Alternative, the proposed widening of the Mercer Street underpass and construction of a new bridge at Thomas Street will increase both vehicular and pedestrian movement between adjacent neighborhoods.

Overall, peak traffic conditions will become substantially more congested. The number of moderately congested intersections will roughly double, and peak traffic congested periods on SR 99 will increase from an estimated 4 to 5

hours per day. Parking availability will be similar to existing conditions, though an estimated 40 on-street spaces would be eliminated.

Traffic improvements would generally improve access to all social resources in the area, which would be a beneficial effect.

5.6.5 Seawall – S. King Street to Myrtle Edwards Park

The proposed improvements for the seawall for the Bypass Tunnel Alternative are very similar to the improvements proposed for the Tunnel Alternative. No property will be acquired. From S. King Street to Pike Street, the seawall will generally be reconstructed using the outside wall of the underground tunnel to function as a seawall. The section further to the north will be rebuilt as described for the Rebuild Alternative.

Like the Rebuild Alternative or the proposed reconstruction using the Frame option, the proposed seawall under the Bypass Tunnel Alternative will be in nearly the same alignment and configuration as the existing seawall. Potential effects on social resources will be the same as described for the Rebuild Alternative.

5.7 Surface Alternative

The Surface Alternative includes a proposed engineering concept plus options for both the south and north segments. With the Surface Alternative, the seawall will also be rebuilt. Potential operational impacts to social resources are evaluated below.

5.7.1 South – S. Spokane Street to S. King Street

SR 99 At-Grade With Elevated SR 519 Interchange

With the Surface Alternative, the south segment will be replaced with an at-grade roadway. For much of this segment, the roadway will be widened to eight lanes, wider than the existing roadway. The alignment will be to the west of the existing roadway to allow combining of the Whatcom Rail Yard and the BNSF SIG Rail Yard. The ramps to SR 519 will rise from the at-grade SR 99 to the elevated SR 519 aerial structure. These improvements will be similar to those previously described for the Rebuild Alternative.

Peak traffic conditions in the south will be congested, and the number of moderately congested intersections would increase from zero to two. In addition, the duration of peak traffic congestion periods on SR 99 will increase from approximately 4 to 9 hours per day. Parking availability in the stadium area will be reduced (mostly long-term, on-street spaces).

Population and Housing

Vehicle and transit access to residential development for the south segment of the Surface Alternative will be degraded compared to current conditions. Traffic volumes for vehicles associated with proposed SR 519 ramps will be slightly higher than current conditions. Combining traffic that currently uses SR 99 and Alaskan Way S. surface street, however, will increase traffic congestion on adjacent local streets in the area. This increase will likely affect access into and out of the St. Martin de Porres Shelter. The change in travel patterns and volumes may be perceived as adverse effects for residents living in the south segment. For additional information, please see Appendix C, Transportation Discipline Report.

Community Facilities

Since the John Stanford Center for Educational Excellence is not located near proposed road improvements associated with the Surface Alternative, no adverse effects will occur to community facilities.

Religious Institutions

There will be no long-term effects on religious institutions. None are located in the south section of the project corridor.

Social and Employment Services

Social and employment services will be affected by this alternative. The proposed new DSHS halfway house and the Salvation Army Adult Rehabilitation Center are located several blocks from roadway improvements proposed as part of the Surface Alternative, but will not be directly affected in the long term. Direct access to these facilities and general vehicular, transit, and pedestrian access are not expected to change in the vicinity of these facilities. However, acquisition of property currently owned by the Longshoremen's and Warehousemen's Union (Local 19) may be needed. The main dispatch office, pensioner's club, and social services for union members are located in the building that would be acquired.

Cultural and Social Institutions

Cultural and social institutions located in the south segment include the Seahawks Stadium, Safeco Field, Stadium Exhibition Center, and the U.S. Coast Guard Museum of the Northwest. Access to these facilities under the Surface Alternative will likely use the new SR 519 ramps. Traffic patterns before and after sports events will be different from current conditions. Reduction in parking is not expected to be substantial, considering the large number of sports fans generally attending stadium events. As the Surface Alternative combines traffic that currently uses both the elevated SR 99 and

Alaskan Way surface street, overall congestion on area arterials will be somewhat higher than current conditions. The capacity of the roadway to accommodate traffic traveling north of the stadiums will be reduced (from current conditions), so congestion will last longer and travel time will increase following sports events. For additional details regarding traffic congestion, see Appendix C, Transportation Discipline Report. Overall, the Surface Alternative will not affect driveway access or general traffic access to facilities.

Government Institutions

The U.S. Coast Guard facility (located at Pier 36) is the only major government institution, besides Terminal 46, that is located in the south area. New grade-separated ramps connecting SR 99 and SR 519 will be constructed east of this government institution. The new roadway will continue at-grade to the north. Neither direct access nor general travel patterns in the vicinity of this facility will change substantially in the future. As the Surface Alternative combines existing traffic that currently uses the elevated SR 99 and Alaskan Way surface street onto a single at-grade roadway, traffic congestion in the vicinity of the U.S. Coast Guard installation is expected to increase. Changes in traffic and levels of congestion are described in more detail in Appendix C, Transportation Discipline Report. Overall, no adverse effects on access or use are expected.

Neighborhood Cohesion

The Surface Alternative in the south segment will differ from existing conditions. The demolition of the elevated structure will remove a physical and visual obstruction in the neighborhood, and will improve connectivity between the waterfront and adjacent neighborhoods. The construction of this alternative, however, will require acquisition of 23 properties and will require displacement of 16 structures. Together, the businesses currently operating in these structures employ an estimated 473 workers, who may be displaced unless the businesses relocate in the area. None of the displaced businesses serve the needs of local neighborhood residents. This number is small compared to the very large number of workers in the Duwamish industrial area; however, this loss of jobs is more than twice as many as any other alternative for the south segment. If the tail track were located to the north of S. Royal Brougham Way, the Surface Alternative would require a similar number of acquisitions and displacement as the Tunnel and Bypass Tunnel Alternatives. For additional information, please see Appendix K, Relocations Technical Memorandum and/or Appendix P, Economics Technical Memorandum.

The street network and links to existing community facilities and services will be similar to existing conditions, but pedestrian access will be different. The high volume of traffic, congestion duration, and the wide surface street could discourage pedestrians from crossing Alaskan Way surface street to reach the waterfront. However, the increased number of signalized intersections on Alaskan Way will also increase pedestrian access and safety to the waterfront. These changes together could affect the perceived accessibility of this area. Overall, this mix of potential effects would not be considered substantial and adverse on neighborhood cohesion.

Option: SR 99 At-Grade With At-Grade SR 519 Interchange

The option for the south segment of the Surface Alternative would be similar to the proposed south segment alternative described above, but access to SR 519 would be from an at-grade signalized intersection. As such, both SR 99 and SR 519 would be at-grade. Signalized intersections would be established at S. Atlantic Street and S. Royal Brougham Way. For this option, the BNSF SIG Rail Yard would be reconfigured to incorporate the Whatcom Rail Yard, and the BNSF tail track would be shifted south and east of SR 99. To make these changes, the reconfigured rail yard would be expanded to the south of S. Spokane Street.

The potential effects of this option would be similar to the effects described above for the Surface Alternative. The elevated structures would be removed, which could improve neighborhood cohesion. The at-grade intersection with SR 519 would not result in new or different effects on social resources. The one exception would likely be substantial traffic congestion following sports events at the stadiums, as access to and from SR 99 would be controlled by street signals, rather than freeway ramps. As a result, travel times would likely increase. Extending the combined rail yards to the south of S. Spokane Street would not result in new or different effects on social resources. Both the existing site and the expanded site are currently in railroad and/or industrial land use. Overall, despite the changes, this option would not likely result in adverse effects on social resources, except during large stadium events when travel north on SR 99 would be constrained.

5.7.2 Central – S. King Street to the Battery Street Tunnel

In the central segment of the Surface Alternative, the existing stacked aerial structure and the existing Alaskan Way surface street will be combined into a single at-grade roadway. Along the central waterfront, the roadway will be seven lanes (three lanes each direction and one middle turn lane) plus an additional one-lane southbound service road will be constructed immediately to the west to provide delivery truck access to waterfront businesses.

Intersections with local streets will be signalized. To ensure adequate vertical clearance over the existing BNSF railroad tracks, the surface roadway will ascend into a short side-by-side aerial structure with ramps to Western and Elliott Avenues. The existing Battery Street and Western Avenue ramps would be used for emergency access only. After crossing the railroad tracks, the side-by-side structure will descend into the Battery Street Tunnel.

Peak traffic conditions will change substantially under this alternative compared to current conditions. The number of congested intersections will increase from 7 to 14, and half will be highly congested. More importantly, the duration of peak traffic congestion conditions on SR 99 will more than double from approximately 4 hours to an estimated 9 hours per day. Available parking spaces in the area will also be reduced substantially compared to existing conditions. There will be a reduction of 148 spaces, or 79 percent of parking spaces in the Pioneer Square area (almost entirely short-term on-street spaces) and 337 spaces, or 52 percent of parking spaces in the central waterfront area (predominantly short-term on-street spaces).

Population and Housing

The Surface Alternative will combine traffic currently using SR 99 and traffic using Alaskan Way. The increased traffic congestion could affect pedestrian and transit travel routes and travel time to and from the Bread of Life Mission or the Lutheran Compass Center (Friedhoff 2003). Elements in the Flexible Transportation Package are intended to assist transit operations under congested conditions. (For additional information, please see Appendix C, Transportation Discipline Report.)

As the roadway will generally operate at capacity, noise levels will tend to be higher during non-peak hours when lower volumes of traffic will be faster moving and will generate more vehicular noise compared to peak hours. (For additional information, please see Appendix F, Noise and Vibration Discipline Report.) People residing on Alaskan Way surface street, such as residents of the Waterfront Landing condominiums, as well as the many residents on Western, Elliott, and First Avenues, will likely experience increased traffic volumes on their streets. This may be perceived as an adverse effect on the quality of life in their neighborhood.

Community Facilities

As described above, there are many childcare facilities, public schools, technical schools, as well as a university branch campus located in the central segment. The roadway improvements proposed for the Surface Alternative will not require modifications to driveway access to any of these facilities, nor will local street access be altered. General travel patterns, however, will

change as all existing traffic using SR 99 as well as traffic using the Alaskan Way surface street will be combined into a single at-grade roadway. All intersections will be controlled by traffic signals which will lengthen travel time but improve access and connectivity to downtown by allowing turning movements at each intersection. Planned transit services such as the Seattle Monorail Project Green Line and Sound Transit Link Light Rail will increase transit service in the future. Travel routes to and from community facilities will change, and congestion levels will be higher than existing conditions.

Religious Institutions

There are several religious institutions located in the central segment, but most are generally located more than two blocks away from proposed road improvements. Travel routes to centrally located religious institutions will be nearly as easy as current routes as the road network will have more connectivity than current conditions. As described above, traffic congestion will be more severe than current conditions and travel times would increase. Driveway access to facilities will not change. Overall, these changes would not be adverse effects, especially considering that travel to these institutions is not usually an everyday occurrence, and most trips will occur on weekends when traffic volumes will be less.

Social and Employment Services

As described above, there are many social and employment services located in the central segment. None of the existing service providers (exclusive of emergency or special needs housing services) are located immediately adjacent to proposed improvements associated with the Surface Alternative. Driveway access and the general travel routes to buildings containing service providers are not expected to change substantially. Vehicle access to and from SR 99 will change considerably as traffic currently using the viaduct as well as the surface street will be combined on a single widened surface road. This is not likely to be perceived as a substantial change or adverse effect.

For clients of services, pedestrian access will not change substantially. Pedestrian crossing of the Alaskan Way surface street will be safer with the increased number of signalized intersections. The change in the roadway network could be perceived as a substantial change for some potential employers who might hire workers from the Millionaire Club Charity, as access will take longer due to increased levels of congestion. The proposed road improvements, however, will not affect existing local streets, and access between service providers will not likely be affected.

Cultural and Social Institutions

Access to the many cultural and social institutions located in the central segment could change under the Surface Alternative. Most are located several blocks away from the proposed roadway improvements, so driveway access will not change from existing conditions. Under this alternative, however, the traffic using SR 99 will combine with traffic on the Alaskan Way surface street through the downtown area. Intersections will be controlled by traffic signals, but congestion levels will be higher than current levels. Traffic destined for downtown cultural or social events will need to use local surface streets, but connectivity of local streets will increase under this alternative. Travel routes will change and travel time will increase. The Surface Alternative should cause no serious adverse effects on cultural and social institutions located in the central segment.

Government Institutions

There are many government-related office buildings located in downtown Seattle in the central segment. Except the Colman Dock Ferry Terminal at Pier 52, no driveway or direct street access will change for any of these facilities under the Surface Alternative. General transportation access will not change. Travel to these facilities from outside of the downtown area will increase. The number of signalized intersections will increase connectivity, so traffic will have improved access to downtown east-west streets. Traffic congestion levels, however, will be higher than current levels due to roadway capacity constraints. This effect may be perceived as an adverse effect. Elements of the Flexible Transportation Package will help mitigate some of these potential effects.

Roadway changes, as well as changes to access to the Colman Dock Ferry Terminal (Pier 52), will occur under the Surface Alternative. The proposed relocation of the historic Washington Street Boat Landing on the western end of Pier 46 and the construction of an over-water dock to provide access to Colman Dock during AWV construction will not have adverse effects.

Neighborhood Cohesion

In the central segment of the Surface Alternative, the demolition of the existing elevated structure will be a benefit to the community. Views of the waterfront will be unobstructed, which should encourage pedestrians to walk along the waterfront. This alternative includes maintaining the Marion Street pedestrian bridge over Alaskan Way. Those pedestrians not using a pedestrian overpass will need to cross a multi-lane, at-grade, principal arterial. The increased noise during non-peak times, general traffic congestion, and the increased time required to cross the roadway, despite the

additional number of signalized intersections (estimated to be two traffic signal cycles), may discourage some pedestrian circulation along the waterfront.

The construction of this segment of the alternative will also require the acquisition of nine parcels, including four structures. An estimated 107 jobs may be displaced, but this is a very small proportion of downtown Seattle jobs. The purchase of property will displace one restaurant and will require the temporary relocation of a fire station. Together, these effects will likely be seen as a mix of both adverse and beneficial effects to neighborhood cohesion.

5.7.3 North Waterfront – Pike Street to Broad Street

In the north waterfront segment, the Surface Alternative will require rebuilding of the existing Alaskan Way surface street. Peak traffic conditions for this alternative will be similar to current conditions with no congested intersections in the immediate area. The duration of peak traffic conditions on SR 99, however, will generally increase from approximately 4 hours to an estimated 9 hours per day. There will be a net increase of 6 parking spaces in this segment of the corridor.

Population and Housing

The combining of traffic currently using SR 99 and Alaskan Way will only slightly increase traffic congestion on the Alaskan Way surface street and nearby parallel north-south roadways. The substantial increase in duration of peak period congestion on SR 99, however, would likely increase travel time for those living outside of the project area when they visit the north waterfront area via private vehicle. These changes may be perceived as adverse effects for the quality of life of residents in the north waterfront area.

Community Facilities

Improving the Alaskan Way surface street is not expected to affect driveway access or general access to or from the Art Institute. Traffic congestion on local streets will be similar to existing conditions.

Religious Institutions

No religious institutions are located along the Alaskan Way surface street, so the Surface Alternative will not affect any such institutions.

Social and Employment Services

The proposed improvements to the Alaskan Way surface street for this alternative will not affect any social or employment service organizations as none are located in buildings adjacent to the project corridor. No effects will occur.

Cultural and Social Institutions

Improving the Alaskan Way surface street is not expected to affect general transportation access to either the Seattle Aquarium or the Odyssey Maritime Discovery Center located on the west side of the roadway. The proposed one-way southbound service road will continue to provide access to these facilities for deliveries. No effects will occur.

Government Institutions

Both direct and general access to the Port of Seattle cruise ship terminal and headquarter offices located at Pier 69 will be similar to or better than existing conditions for the Surface Alternative. No adverse effects will occur.

Neighborhood Cohesion

Rebuilding the Alaskan Way surface street in the north waterfront segment for the Surface Alternative is not expected to result in adverse effects on neighborhood cohesion. No property will be acquired. Combining the traffic from the existing elevated Alaskan Way Viaduct with the existing surface street traffic will not generally increase traffic volumes or congestion on Alaskan Way. Much of the existing environment will be preserved. No adverse effects will occur.

5.7.4 North – Battery Street Tunnel to Ward Street

Widened Mercer Underpass

In the north segment of the Surface Alternative, improvements will be made to both the Battery Street Tunnel and Mercer Street. Starting with the Battery Street Tunnel, fire/life safety improvements will be made and the tunnel will be lengthened to improve ventilation with new jet fans. To the north of the Battery Street Tunnel, a new bridge will be constructed across Aurora Avenue N. at Thomas Street. In addition, the existing Mercer Street underpass crossing of Aurora Avenue N. will be widened to accommodate three lanes in each direction. One parcel (with no structures on it) will need to be acquired. These are the same improvements proposed for the Aerial Alternative.

Potential effects to community facilities, religious and cultural/social institutions, government institutions, and social and educational service providers will be the same as those for the Aerial Alternative. Minor basement modifications will be made to two buildings to accommodate new emergency egress from the Battery Street Tunnel. Existing structure uses will be able to continue long-term. All driveway and general traffic connectivity in the area will be similar to current conditions. The widening of Mercer Street and construction of the Thomas Street Bridge will improve the

movement of vehicles and pedestrians between South Lake Union and the Uptown neighborhood.

Peak traffic conditions will be substantially more congested than current conditions. The number of congested intersections will increase from 3 to 7. The duration of peak traffic congestion periods on SR 99 will increase from approximately 4 hours to an estimated 9 hours per day.

Parking availability will be similar to current conditions. Approximately 40 on-street spaces will be eliminated. The improvements proposed under the Surface Alternative will result in mixed beneficial and adverse effects to social resources in the north segment.

Option: Existing SR 99 With Added Signals at Roy, Republican, and Harrison Streets

The option for the north segment of the Surface Alternative would improve both the Battery Street Tunnel and the Aurora Avenue N. corridor. Fire/life safety improvements would be installed and the tunnel would be lengthened to improve ventilation (as described for the alternative). Unlike previously described alternatives for the north segment, this option would maintain the existing configuration of the Mercer Street underpass crossing of Aurora Avenue N. New at-grade intersections with Aurora Avenue N. would be constructed at Republican, Harrison, and Roy Streets. These new at-grade intersections on Aurora Avenue N. would be controlled by traffic signals, typical of most downtown local street intersections. This design would reflect the at-grade arterial boulevard concept in the central segment. In addition, Broad Street would be closed from Fifth Avenue N. to Ninth Avenue N. These improvements would reconnect several local streets in the South Lake Union neighborhood similar to the Lowered Aurora/SR 99 option for the Aerial Alternative.

These roadway improvements would require minor basement modifications to two existing buildings. Long term, the land uses within these buildings would not be affected. Driveway access to any community facilities or cultural or social institutions in the area would not be affected. General transportation access would improve in the South Lake Union neighborhood due to the reconnection of local streets across Aurora Avenue N. The at-grade intersections with Aurora Avenue N., however, would likely cause increased traffic congestion in the area due to the lack of a limited-access arterial to bypass downtown areas. These changes overall could be perceived as both substantial adverse effects and benefits to social resources in the Uptown and South Lake Union neighborhoods.

5.7.5 Seawall – S. King Street to Myrtle Edwards Park

Proposed improvements for the seawall for the Surface Alternative will be the same improvements described above for the Rebuild Alternative. No properties will be acquired. The existing seawall will be rebuilt from S. King Street to Virginia Street. From Virginia Street north to Myrtle Edwards Park, exclusive of the portion at the Cruise Ship Terminal (Pier 69), the seawall will also be rebuilt.

The proposed seawall for the Surface Alternative will be in nearly the same alignment and configuration as the existing structure. Potential effects on the social resources will be the same as described earlier for the Rebuild Alternative. This alternative is not expected to result in any substantial adverse effects on social resources.

5.8 Summary of Benefits by Alternative

The above sections described both substantial adverse effects as well as benefits to neighborhoods for each of the alternatives. This section is a brief summary of the benefits of each of the alternatives proposed for the AWW Project.

5.8.1 No Build Alternative

For the No Build Alternative, no improvements will be made to SR 99, the viaduct, the Battery Street Tunnel, or roadways in the Aurora Avenue S. corridor. Both the viaduct and the seawall would continue to operate and be maintained, though they would likely be replaced sometime before 2030. Existing on- and off-ramps to SR 99 will remain, and traffic congestion will only slightly increase. Existing conditions for almost all social resources will remain unchanged. Particular benefits attributable to this alternative include the following:

- No improvements will be made to the viaduct and seawall facilities, so existing conditions of social resources will remain the same for the foreseeable future.

5.8.2 Rebuild Alternative

For the Rebuild Alternative, much of the existing viaduct will be retrofitted and some sections will be reconstructed in place. The seawall will be rebuilt. No improvements will be made to the Battery Street Tunnel or roadways in the Aurora Avenue N. corridor. Existing on- and off-ramps to SR 99 will remain with one exception. The two ramps located at Battery Street and Western Avenue will be closed except for emergency use. Traffic congestion

will only slightly increase. Particular benefits attributable to this alternative include the following:

- Most existing conditions of social resources will remain unchanged.
- Additional access and reduced traffic congestion will occur in the stadium area due to the construction of the new SR 519 ramps. The increase in general transportation access to this neighborhood could benefit local businesses and industries and increase the interaction of people in this neighborhood.
- Access to Colman Dock Ferry Terminal will be modified to maintain access during construction of the AWV Project.
- Closure of the Battery Street and Western Avenue ramps for general use could improve the perceived quality of life in the immediate area due to reduced traffic congestion and noise.
- The seawall will be rebuilt with minimal long-term impacts to social resources.

5.8.3 Aerial Alternative

The Aerial Alternative will involve the construction of a replacement roadway for SR 99 and the seawall will be rebuilt. The SR 519 interchange will be constructed. Particular benefits attributable to this alternative include the following:

- Most existing conditions of social resources will remain unchanged.
- Additional access and reduced traffic congestion will occur in the stadium area due to the construction of the new SR 519 ramps. This increase in general transportation access to this neighborhood could benefit local businesses and industries and increase the interaction of people in this neighborhood.
- Access to Colman Dock Ferry Terminal will be modified to maintain access during construction of the AWV Project.
- Closure of the Battery Street and Western Avenue ramps for general use will improve the perceived quality of life in the immediate area due to reduced traffic congestion and noise.
- Mercer Street will be widened and a new bridge will be constructed over Aurora Avenue N. at Thomas Street, both of which will reconnect the local street grid and generally enhance neighborhood cohesion.
- The seawall will be rebuilt with minimal long-term impacts to social resources.

5.8.4 Tunnel Alternative

The Tunnel Alternative will involve the construction of a six-lane roadway underground within the existing Alaskan Way surface street right-of-way. SR 519 ramps will be constructed, but downtown ramps will be reduced in number. Particular benefits attributable to this alternative include the following:

- Additional access and reduced traffic congestion will occur in the stadium area due to the construction of the new SR 519 ramps. The increased traffic volumes and access to this neighborhood could benefit local businesses and industries. These changes would likely increase the interaction of people in this neighborhood.
- Access to Colman Dock Ferry Terminal will be modified to maintain access during construction of the AWW Project.
- The reduction in the number of downtown ramps will lower traffic volumes, congestion, and noise levels downtown near some existing ramps. This will improve quality of life and neighborhood cohesion.
- The removal of the existing elevated viaduct structure will open views of Elliott Bay from the downtown area and will remove the shadowing effect of the existing structure. These changes will improve pedestrian access and adjacent neighborhood connectivity with the waterfront.
- Closure of the Battery Street and Western Avenue ramps for general use will improve the perceived quality of life in the immediate area due to reduced traffic congestion and noise.
- Mercer Street will be widened and a new bridge will be constructed over Aurora Avenue N. at Thomas Street, both of which will reconnect the local street grid and generally enhance neighborhood cohesion.
- The seawall will be rebuilt.

5.8.5 Bypass Tunnel Alternative

The Bypass Tunnel Alternative will involve the construction of a four-lane underground tunnel within the existing Alaskan Way surface street right-of-way. Existing traffic on the viaduct will use both the new tunnel and the Alaskan Way surface street. SR 519 ramps will be constructed, but the number of downtown ramps will be reduced. Particular benefits attributable to this alternative include the following:

- Additional access and reduced traffic congestion will occur in the stadium area due to the construction of the new SR 519 ramps. The increased traffic volumes and access to this neighborhood could

benefit local businesses and industries and increase the interaction of people in this neighborhood.

- Access to Colman Dock Ferry Terminal will be modified to maintain access during construction of the AWW Project.
- The reduction in the number of downtown ramps will lower traffic volumes, congestion, and noise levels downtown near some existing ramps. This will improve quality of life and neighborhood cohesion. These benefits, however, will be less than those described for the Tunnel Alternative.
- The removal of the existing elevated viaduct structure will open views of Elliott Bay from the downtown area and will remove the shadowing effect of the existing structure. These changes will improve pedestrian access and adjacent neighborhood connectivity with the waterfront.
- Closure of the Battery Street and Western Avenue ramps for general use will improve the perceived quality of life in the immediate area due to reduced traffic congestion and noise.
- Mercer Street will be widened and a new bridge will be constructed over Aurora Avenue N. at Thomas Street. These changes will reconnect the local street grid and generally enhance neighborhood cohesion.
- The seawall will be rebuilt with minimal long-term impacts to social resources.

5.8.6 Surface Alternative

The Surface Alternative will involve the construction of a seven-lane at-grade central waterfront roadway within the existing right-of-way. All existing traffic on the viaduct and the Alaskan Way surface street will need to use this new roadway. SR 519 ramps will be constructed, and connectivity with downtown streets will greatly improve. Particular benefits attributable to this alternative include the following:

- Access to the Colman Dock Ferry Terminal will be modified to maintain access during construction of the AWW Project.
- Connectivity between SR 99 and downtown streets will be the best of any of the proposed Build Alternatives, which will improve vehicle, transit, and pedestrian access to all social resources in the project corridor.

- The high levels of congestion will reduce noise levels from traffic during peak periods, which will improve the quality of life for residents living adjacent to the project corridor.
- The removal of the existing elevated viaduct will open views of Elliott Bay from the downtown area and will remove the shadowing effect of the existing structure. These changes will improve pedestrian access and adjacent neighborhood connectivity with the waterfront. The increased number of signalized intersections compared to the other alternatives will greatly increase access and connectivity along the waterfront.
- Closure of the Battery Street and Western Avenue ramps for general use will improve the perceived quality of life in the immediate area due to reduced traffic congestion and noise.
- Mercer Street will be widened and a new bridge will be constructed over Aurora Avenue N. at Thomas Street. These changes will reconnect the local street grid and generally enhance neighborhood cohesion.
- The seawall will be rebuilt with minimal long-term impacts to social resources.

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Chapter 6 CONSTRUCTION IMPACTS

This section of the technical memorandum discusses anticipated changes and disruptions that could affect social resources during the construction period of each of the proposed project alternatives. The first section discusses potential effects of the No Build Alternative. The second section discusses potential effects that will be common to all of the Build Alternatives. In particular, potential increases or decreases in population and housing are discussed. The last sections describe potential construction effects related to individual Build Alternatives. Mitigation measures for construction impacts are discussed separately in Chapter 9.

6.1 No Build Alternative

For each of the three scenarios proposed for the No Build Alternative, there will be no planned construction activities to rebuild or replace the Alaskan Way Viaduct or the seawall in the near term. Both facilities, however, would likely be replaced before 2030. As needed, repair and maintenance work will be planned consistent with current practices. These activities will cause only short-term temporary disruptions. Each repair or maintenance job will likely be completed in a number of weeks or several months at most. Construction zones will be expected to be limited in size, perhaps only several city blocks at most. Large construction staging areas will not likely be established. Construction activities are expected to occur mostly on weekdays during daytime hours (generally 7 a.m. to 6 p.m.). As planned work efforts, normal mitigation measures to ensure access to buildings and use of adjacent properties and nearby land uses will be implemented. All impacts to social resources will be short-term and temporary. As such, there will be no substantial adverse effects on any social resources.

6.2 Impacts Common to All Build Alternatives

6.2.1 Population and Housing

Potential project construction effects on population and housing will arise under two scenarios. The demand for construction workers can attract workers from outside the region to move to the project area for employment opportunities. In addition, construction activities can adversely affect the lives of residents living near construction zones. The following sections describe these potential effects.

Workers and Housing

The population of a community or region can sometimes increase temporarily during project construction due to a high demand for construction workers. When large numbers of workers are employed on a construction project, the workers and perhaps their family members may move temporarily to the area. Depending on the duration of employment on the construction project, workers may decide to reside in visitor accommodations such as motels or RV camping facilities. If their employment is many months or years, a worker and his or her family may decide to rent an apartment or home or to purchase a house. Such demand on area housing can affect both the availability and/or price of housing in the region.

For the AWV Project, the number of workers and skills required for the construction of the project has been estimated. Overall, the construction of the project will require many workers to be employed for many years (between 7.5 and 11 years). Estimates of the average annual number of construction jobs required for each of the proposed alternatives and anticipated duration of the construction periods are shown in Exhibit 6-1. Among the five Build Alternatives, the average number of construction jobs will range between approximately 941 and 1,317 workers per year. The required skills will be those typical of construction workers.

Exhibit 6-1. Demand for Construction Workers by Alternative

Alternative	Total Average Annual Construction Jobs	Construction Duration (years)	Proportion of Forecasted Regional 2010 Construction Work Force
No Build	0	0	0.0%
Rebuild	1,212	7.5	1.0%
Aerial	941	11.0	0.8%
Tunnel	1,317	9.0	1.1%
Bypass Tunnel	1,112	8.5	0.9%
Surface	988	8.0	0.8%

Note: The 2010 forecasted wage and salary employment for the construction sector of the regional economy is 121,100 workers. The region defined for this forecast includes King, Pierce, Kitsap, and Snohomish Counties.

Source: Appendix P, Economics Technical Memorandum; PSRC (2002).

In 2010 (near the start of proposed project construction), the total number of workers employed in the construction sector of the regional economy is forecasted to be approximately 121,100 workers. As shown in the table above, the average annual number of workers employed on the AWV Project will be only a very small percent of the forecasted number of workers in the region's construction sector. For each of the project alternatives, the demand for

construction workers will be less than 2 percent of the forecasted regional work. For each of the project alternatives, the demand for construction workers will be less than 2 percent of the forecasted regional work force.

The size of the forecasted regional work force and particularly the construction sector appears to be more than adequate to accommodate the anticipated demand for construction workers associated with the proposed project. Workers from outside the region will generally not be expected to move to the area for employment opportunities specifically associated with the AWW Project. Some workers, however, will move to the area as part of the normal movement of workers from one labor market to another. In addition, a very small number of workers with specialty job skills will move to the region for short-term temporary employment opportunities. For additional information, please see Appendix P, Economics Technical Memorandum. In conclusion, it is not anticipated that the demand for project construction workers and their need for housing will directly affect population or the demand or price of housing in the Puget Sound region.

Residents and Housing

Construction activities could have several different types of effects on residents living near the construction zone. Construction-related traffic will likely affect residents living in a broad area from the construction zone. The construction traffic, light and glare, noise, and dust will certainly affect residents living within approximately one to two blocks of the construction zone. In addition, residents living across the street or adjacent to potential construction staging areas will also be affected.

For the proposed project, trucks will most likely be the primary mode used to transport both workers and materials to and from the project corridor construction zone. Existing city-designated haul routes will most likely be used for the proposed project. From the south, these routes will include E. Marginal Way S., SR 99, S. Michigan Street, S. Spokane Street, and I-5. From the north, these routes will include I-5 and Elliott Avenue. Actual routes specific to the proposed project will likely be determined by the City of Seattle and/or WSDOT as part of project permitting. Outside of the actual construction zone, these haul routes do not traverse areas that are primarily residential in character.

Isolation of the construction activities to ensure public safety will require corridor fencing, temporary road closures, and traffic detours. The closures and detours will likely be needed for varying periods of time, some for many years and others for perhaps only months. As project construction progresses, the road closures and traffic detours will change to best accommodate

construction needs and to minimize traffic congestion. Specific routes will be determined both during project permitting and as part of ongoing construction management activities. At this time, the specific road closures and traffic detours are unknown, so the potential extent and duration of such effects on nearby residents is unknown. These construction impacts, however, may cause temporary hardships and/or stress to some residents, especially to elderly, disabled, and transit-dependent persons.

In the immediate construction area, noise from specific construction equipment may travel up to 0.5 mile from the construction zone. Residents generally will hear noises associated with the operation of construction equipment up to a distance of approximately one to two blocks. Construction-related noise will occur 24 hours per day and 7 days per week while construction activities are ongoing at a particular location. Residents living across the street will be able to view construction activities and equipment storage areas within the fencing, especially from top floors of buildings. Lights will be directed at construction activities and shielded, but residents will see some lighting and glare. Construction vehicles will enter and exit the construction zone at gates in the perimeter fencing surrounding the construction zone. These gates will likely be located at the ends of streets abutting the construction zone. Pedestrian and vehicle use of some streets may be limited. In addition, direct access to and from some buildings may be disrupted, though not eliminated, for short periods of time.

Some residents will be affected by the construction activities associated with the potential construction staging area. A map of the potential construction staging areas proposed for the AWV Project is contained in Appendix B, Alternatives Description and Construction Methods Technical Memorandum. Potential disruptions from staging areas could occur to residents living near the following intersection areas: (1) First Avenue S. north of S. Royal Brougham Way, (2) Yesler Way and Western Avenue, (3) Spring Street and Western Avenue, (4) Union Street and Western Avenue, (5) Pike Street and Alaskan Way surface street, and (6) Battery Street and Western Avenue. Residents living across the street from the potential staging areas will hear vehicles and equipment entering and exiting. The sites will be fenced and lighted for most, if not the entire duration, of the project construction period. In addition, the potential staging areas could be operational during some portion of the site preparation and utility relocation activities occurring during the 18 months preceding the start of project construction.

Considering noise and light and glare disruptions caused by construction activities and potential staging areas, noise impacts will affect the most people. Light and glare will primarily affect residents with windows in direct

line-of-sight of construction activities. Noise effects, however, extend up to two blocks away or more. Moreover, noise from construction activities will occur 24 hours per day and 7 days per week. Residents will be particularly sensitive to nighttime noise and light.

All of the project alternatives basically follow the same alignment (i.e., the existing alignment of SR 99), so the construction impact area as defined by noise impacts is nearly the same for each of the alternatives. The only exception is the Rebuild Alternative, which does not include any roadway improvements in the north segment.

Exhibit 6-2 shows the total number of dwellings and an estimated population that will be generally affected by project construction activities, excluding the potential staging areas. In total, the construction impact area defined by noise impacts includes an estimated 6,183 dwellings with a total population of approximately 9,759. Of these dwellings, an estimated 1,336 units, or approximately 22 percent, are low-income, special needs, or emergency shelter units. These units house an estimated 1,895 low-income residents. Because a number of the low-income units include spaces or “beds” available at shelters, the occupancy of low-income units is assumed to be one person, less than the average 1.58 persons per dwelling in the study area as a whole.

Exhibit 6-2. Construction Effects on Housing and Population

	South Segment	Central Segment	North Waterfront Segment	North Segment	Seawall Segment	Impact Area Total
Total Dwelling Units	375	3,871	1,189	1,504	3,039	6,183
Total Populations	593	6,033	1,878	2,366	4,802	9,759
Low-Income Dwelling Units	212 (57%)	1,004 (26%)	102 (9%)	80 (5%)	403 (13%)	1,336 (22%)
Low-Income Population	212 (36%)	1,503 (25%)	161 (9%)	116 (5%)	637 (13%)	1,895 (19%)

Notes: Dwellings are those that will be affected by noise impacts, or those located within approximately one to two blocks of the construction area. The term dwelling does not include stays in hotels and motels. Low-income housing includes subsidized housing, special needs housing, and emergency housing such as shelters. Population is calculated using the average size of households in the study area, or 1.58 persons per household, but assumes 1.0 person per unit for shelters and transitional housing. The study area total is not the sum of the component parts due to overlap of project corridor segments.

Source: Appendix F, Noise and Vibration Discipline Report.

Exhibit 6-2 also provides an estimated number of dwellings and population that could be affected in each of the alternative segments. The sum of the dwellings and population presented for each of the segments, however, does not equal the total for the study area. In fact, the sum of the several segments totals much more than the total presented. This is because there is overlap of

the two-block impact area between the central and the north waterfront roadway segments near Pike and Pine Streets. In addition, there is overlap of the central and north waterfront segments and the seawall segment.

The point in discussing this information is to show that some residents will be affected by construction activities associated with more than one project element (i.e., roadway versus seawall segments), and depending on project construction sequencing, residents could be repeatedly affected by construction activities considering activities are not expected to move linearly from one end of the project to another. For additional information on construction sequencing schedules, please see Appendix B, Alternatives Description and Construction Methods Technical Memorandum.

Exhibit 6-2 also presents the number of low-income households residing in the immediate construction area (two-block radius). Based on 2000 census statistics, an estimated 25 percent of the study area population lives at or below the poverty level (see Section 4.3.5). Exhibit 6.2 indicates that a substantially higher proportion of the population is low-income, including homeless persons residing in shelters in the immediate construction zone in the south segment. In contrast, lower percentages of the population are low-income in the north waterfront and north segments despite the very large number of subsidized dwelling units located in the Belltown and Uptown neighborhoods. Overall, the immediate project construction impact area appears to have a lower percent of the population that is low-income than the larger project study area. Construction activities also may affect homeless persons by removing informal places of shelter, such as underneath the existing viaduct structure. Similarly, construction-related activities may also cause a shifting of locations currently used by homeless persons to congregate. For additional information, please see Appendix J, Environmental Justice Technical Memorandum. It is unknown how many homeless persons could be affected in this manner, but the effects will likely be greater during warm seasons of the year.

On closer examination of the project corridor construction area, many residential buildings are located immediately adjacent to the construction zone. Exhibit 6-3 lists these residential buildings as well as other social resources. Persons residing in the residential buildings are most likely to be affected by noise, light, and glare associated with construction activities. The list clearly shows that the largest share (between 15 and 21 properties) of social resources most affected by construction activities will be residential properties. Construction-related effects from noise, light and glare, and change in access will be greatest for these residential buildings.

Exhibit 6-3. Social Resources Affected by Construction Activities

Project Segment	Building Use	Rebuild	Aerial	Tunnel	Bypass Tunnel	Surface
Housing						
South	St. Martin de Porres Shelter (212 cap.)	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
	Subtotal	1 Adjacent				
Central	Our Home Hotel (14 condos)	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
Central	Compass Center Shelter (new -23 cap.)	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
Central	Compass Center Shelter (79 cap.)	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
Central	Waterfront Place (19 condos)	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
Central	Watermark Tower (condo parking garage)	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
Central	Colonial Grand Pacific (37 condos)	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
Central	Harbor Steps (569 apts)	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
Central	606 Post (10 condos)					Adjacent
Central	Bread of Life Mission (50 cap.)					Adjacent
Central	80 S. Jackson Street (24 condos)					Adjacent
Central	Merrill Place (16 condos)			Adjacent		Adjacent
Central	Elliott Point Apartments (64 apts)	Adjacent			Adjacent	Adjacent
Central	Belltown Lofts (40 condos)	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
Central	Oregon Hotel (83 subsidized units)	Adjacent	Adjacent	Adjacent	Adjacent	
Central	Pomeroy Apartments (48 apts)	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
	Subtotal	11 Adjacent	10 Adjacent	11 Adjacent	11 Adjacent	14 Adjacent
North Waterfront	Waterfront Landing (235 condos)	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
North Waterfront	Waterfront Landing (see above)	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
North Waterfront	Waterfront Landing (see above)	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
North Waterfront	Olympus Apartments (7 apts)		Adjacent	Adjacent	Adjacent	Adjacent
	Subtotal	3 Adjacent	4 Adjacent	4 Adjacent	4 Adjacent	4 Adjacent

Exhibit 6-3. Social Element Properties Affected by Construction Activities (continued)

Project Segment	Building Use	Rebuild	Aerial	Tunnel	Bypass Tunnel	Surface
North	Lexington/Concord Apartments (59 subsidized units)		Adjacent	Adjacent	Adjacent	Adjacent
North	Valley House (18 subsidized units)		Adjacent	Adjacent	Adjacent	Adjacent
	Subtotal	0 Adjacent	2 Adjacent	2 Adjacent	2 Adjacent	2 Adjacent
Community Facilities						
Central	Art Institute South Campus		Adjacent	Adjacent	Adjacent	
	Subtotal	0 Adjacent	1 Adjacent	1 Adjacent	1 Adjacent	0 Adjacent
North	School of Visual Concepts		Adjacent	Adjacent	Adjacent	Adjacent
North	Pacific Maritime Institute		Adjacent	Adjacent	Adjacent	Adjacent
	Subtotal	0 Adjacent	2 Adjacent	2 Adjacent	2 Adjacent	2 Adjacent
Religious						
North	Church of Scientology		Adjacent	Adjacent	Adjacent	Adjacent
	Subtotal	0 Adjacent	1 Adjacent	1 Adjacent	1 Adjacent	1 Adjacent
Social & Employment Services						
North	Catholic Seamen's Club		Adjacent	Adjacent	Adjacent	Adjacent
	Subtotal	0 Adjacent	1 Adjacent	1 Adjacent	1 Adjacent	1 Adjacent
Cultural & Social						
North Waterfront	The Seattle Aquarium	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
North Waterfront	Odyssey Maritime Discovery Center	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
North Waterfront	Bell Harbor Conference Center	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
North Waterfront	Olympic Sculpture Park (Seattle Art Museum)		Adjacent	Adjacent	Adjacent	Adjacent
	Subtotal	3 Adjacent	4 Adjacent	4 Adjacent	4 Adjacent	4 Adjacent
Government						
South	Port of Seattle Cruise Terminal		Adjacent	Adjacent	Adjacent	Adjacent
South	U.S. Coast Guard	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
	Subtotal	1 Adjacent	2 Adjacent	2 Adjacent	2 Adjacent	2 Adjacent

Exhibit 6-3. Social Element Properties Affected by Construction Activities (continued)

Project Segment	Building Use	Rebuild	Aerial	Tunnel	Bypass Tunnel	Surface
Central	Port of Seattle Hanjin Terminal	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
Central	Washington Street Boat Landing	Relocate	Relocate	Relocate	Relocate	Relocate
Central	Colman Dock Ferry Terminal	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
Central	Port of Seattle Cruise Ship Terminal	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
Central	Port of Seattle Marine Headquarters	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
	Subtotal	4 Adjacent 1 Relocate				
	TOTAL	23 Adjacent 1 Relocate	32 Adjacent 1 Relocate	33 Adjacent 1 Relocate	33 Adjacent 1 Relocate	35 Adjacent 1 Relocate

Note:

Adjacent means building is within 50 feet of construction activity.

6.2.2 Community Facilities

As described in Chapter 4, the project study area encompassing approximately five blocks to either side of the project corridor includes a number of community facilities. Potential construction effects on workers, students, children, and others at community facilities will most likely perceive the effects to be less than those experienced by residents. These people will typically be at the community facility during daytime hours. Most people have higher thresholds for loud noises, light and glare, and dust during daytime hours. For additional discussion, please see Appendix F, Noise and Vibration Discipline Report. As such, primary concerns will be related to building access, i.e. doors, garages, driveways, and walkways. In addition, people will be concerned about their ability to gain vehicular and transit access to the neighborhood and building.

Even for community facility buildings located adjacent to the construction zone, such as the Pacific Maritime Institute, general transportation access and building access will be ensured. Construction zone fencing will have gates for vehicles to enter buildings, as needed. Fencing will provide for a minimum of 4 to 6 feet of pathway for pedestrians to enter buildings. Signs will be posted to direct both vehicular and pedestrian traffic. As such, community facilities will experience some adverse effects, but not substantial adverse effects.

6.2.3 Religious Institutions

Potential construction effects on religious institutions will be more similar to effects experienced by residents than those experienced by people at community facilities. Again, construction activities will be ongoing 24 hours per day and 7 days per week. So, despite the customary attendance of events at religious institutions only 1 day per week, construction effects will likely be perceived as substantial adverse effects. Religious institutions are places of worship, quiet contemplation, and meditation. Loud construction noises will disrupt the experience normally expected at such institutions.

For the project study area, potential adverse construction effects may be experienced by members of the Church of Scientology, which is just one block from the construction zone. In addition, the Anchorpointe Seventh Day Adventist Church, Horizon Church, Denny Lutheran Church, and Unity Church are all located within two blocks of the construction zone.

6.2.4 Social and Employment Services

Potential construction-related effects on social and employment services will be most similar to those described above for community facilities. People inside of the buildings, workers or clients, will primarily be in the building

during daytime hours. As such, they will have a higher threshold for noise, light and glare, and dust. The effects will be experienced, but will not likely be perceived as substantial adverse effects. The Catholic Seamen's Club is the only social and employment services organization adjacent to the construction zone.

Social and employment services, however, also must be able to continue to provide services to their clients during the construction period. This may include referring their clients to other social or employment service agencies. The clients most likely will take public transportation or walk to the location of the other service agency. In addition, some service agencies may provide transportation for their clients. For example, residents of the St. Martin de Porres Shelter near Pier 36 are transported each morning to the Lazarus Day Center in the Pioneer Square area. The Millionaire Club Charity located near Wall Street and Western Avenue also has a designated outside location where day laborers wait to get picked up for casual day-labor work. Such activities will be disrupted by construction activities. Plans, however, could be made in advance to ensure that services will not be compromised. As such, effects on social and employment services will not likely be considered a substantial adverse effect.

6.2.5 Cultural and Social Institutions

The project area has several areas where cultural and/or social institutions are located in close proximity to the construction zone. This includes the stadium area located south of the Pioneer Square neighborhood and the cluster of cultural and performance halls located at the Seattle Center near Fifth Avenue N. and Broad Street. The Seattle Aquarium, Odyssey Maritime Discover Center, Bell Harbor Conference Center and the Olympic Sculpture Park are all located adjacent to the construction zone along the waterfront. Depending on the type of event, construction effects could be perceived as an inconvenience or potentially adverse effect.

Vehicle, transit, and pedestrian access to social and cultural institutions to attend events could be affected by construction activities, particularly construction-related congestion, road closures, and traffic detours. Such effects in the project corridor along the waterfront will affect access to the several museums located along the waterfront. The Broad Street Detour will affect theatres and performance halls at the Seattle Center. Such adverse effects will be particularly severe when the start of events occurs during or close to rush hour traffic periods. The inconvenience caused by reroutes and additional travel time could deter some patrons from attending cultural and social institution events.

The actual event, however, may not be affected by construction-related disruptions. Professional sports events and annual events such as Bumbershoot Arts Festival at the Seattle Center will not likely be affected by construction traffic, noise, and lighting as most of these activities occur some distance from project corridor construction activities, plus the events themselves are very loud. Activities, such as movies or lectures, at the several waterfront museums could be affected, depending on the types of construction activities. On the other hand, events at theatres, the symphony hall, the opera house, and even seasonal outdoor concerts will likely be severely disrupted by construction-related loud noises. These types of cultural and social events require a quiet environment or patrons may not be able to hear the words or music.

In summary, potential effects on cultural and social institutions will be mixed—both substantial adverse effects and little to no effects. For additional information on cultural and social institutions, please see Appendix H, Parks and Recreation Technical Memorandum.

6.2.6 Government Institutions

Potential construction effects to key government office buildings are expected to be similar to those described for community facilities above. Along the waterfront, there are a number of government institutions that are adjacent to the construction zone. The Port of Seattle Cruise Terminal (Pier 30), U.S. Coast Guard (Pier 36), Port of Seattle Terminal 46 (Hanjin), Colman Dock Ferry Terminal (Pier 52), Port of Seattle Cruise Terminal (Pier 69), and the Port of Seattle Marine Headquarters (Pier 69) are located adjacent to the construction zone. Building occupants will be in the building primarily during daytime hours when people generally have a higher threshold for construction-related noise, light and glare, and dust. No adverse effects are expected.

6.2.7 Neighborhood Cohesion

Potential construction-related effects on neighborhood cohesion are more complex to evaluate than the individual effects primarily caused by property acquisition and changes in traffic congestion, noise, light and glare, or dust. Effects on neighborhood cohesion are more closely linked to the cumulative effects from a variety of factors that define neighborhood character. These factors include transportation, infrastructure, pedestrian access, building architecture, landscaping, population characteristics, linkages to community facilities and services, and unique characteristics. All of these factors affect the general mobility and interaction of people residing, working, or visiting in the neighborhood.

Currently, the existing project corridor both defines and disrupts existing neighborhoods. Elevated portions of the viaduct have formed physical obstructions in neighborhoods for over 50 years. Urban development and redevelopment have occurred with this obstruction in place in neighborhoods for decades. Alaskan Way surface street follows the waterfront and defines the outside edge of downtown neighborhoods. Yet as an arterial, traffic volumes and noise levels detract from pedestrian excursions along the waterfront. In addition, Aurora Avenue N. discourages interaction between residents and businesses of the South lake Union and Uptown neighborhoods. For the AWW Project, construction activities associated with the proposed project alternatives are primarily located within this same corridor. The construction effects (traffic congestion, detours, noise, light and glare, and dust) will be in addition to current disruptions. As such, the changes could be perceived as adverse effects, especially by the 23 to 35 social resources located immediately adjacent to the project corridor construction zone. Cumulatively, though, the effects might not be considered substantially adverse because they are primarily confined to the project corridor, which is located on the periphery of many existing project corridor neighborhoods. Some disruptions will be unavoidable.

A key project construction impacts in the Seattle Center area will be the temporary loss of a large amount of parking. In total, an estimated 1,100 parking spaces will be unavailable for use by residents, workers, visitors, or others. This loss of parking for an estimated 7.5 to 11 years will be a severe effect on people who might want to attend special performances or events at the Seattle Center. Patterns of behavior will need to change, as a substantial portion of event attendees will need to take public transportation. Others will likely continue to attempt to park in the neighborhood, which will extend such impacts beyond the geographic area typically affected under existing conditions.

In fact, the long duration of construction activities will be the most obtrusive construction effect on neighborhood cohesion. Each of the proposed project alternatives will require between 7.5 and 11 years of construction, plus an additional 18 months preceding the start of construction for site preparation and utility relocations. Construction activities are proposed to occur 7 days per week and 24 hours per day to meet proposed construction schedules. Construction activities will also occur at several locations within the project corridor simultaneously. These activities together will create ongoing hardship and stress upon residents, workers, visitors, and businesses.

The social fabric of neighborhoods could be affected by the long duration of the project alternative construction schedules. Some residents may decide to

move. Some businesses, such as restaurants/taverns and those selling sundries, may see an increase in business due to the large number of construction workers in the area. Others will suffer little or no adverse effects. And others still may experience a noticeable decline in patronage and/or sales, increased operating costs, and/or decreased operational efficiency. These construction-related effects could adversely affect the comfort and daily life of residents and inconvenience and/or disrupt the flow of customers, employees, and materials/supplies to and from businesses. For additional information, please see Appendix P, Economics Technical Memorandum. Together, these potential changes will adversely affect neighborhood cohesion.

6.3 Rebuild Alternative

Potential construction-related effects for the Rebuild Alternative will not likely go beyond the general types of effects described above for all of the Build Alternatives (see Section 6.2). Traffic will continue to be able to use SR 99 throughout the construction activities except for temporary closures. No major traffic detours are anticipated. A total of 23 social resources would be affected.

6.4 Aerial Alternative

The Aerial Alternative will have all of the same construction-related effects described above common for all of the Build Alternatives. A number of social resources are adjacent to the construction zone. Two community facilities are adjacent to the project corridor - the Art Institute and the School of Visual Concepts. The Catholic Seamen's Club and the Church of Scientology are adjacent in the north segment. In total, 32 social resources are adjacent to the construction zone.

The proposed alternative has two major traffic detours. The Broad Street Detour and the Battery Street Flyover Detour option have been proposed to reroute traffic during construction activities associated with the aerial structure between Pike Street and the south portal of the Battery Street Tunnel. In addition, there is a detour and an optional detour to reroute traffic away from Mercer Street construction activities. For simplicity, these detours and the potential construction effects are discussed below.

6.4.1 Battery Street Tunnel Construction Detours

The proposed detour to take SR 99 traffic away from the Battery Street Tunnel while it is under construction is the Broad Street Detour. The optional detour is called the Battery Street Flyover Detour.

Broad Street Detour

The proposed Broad Street Detour will take SR 99 traffic away from the Battery Street Tunnel during construction upgrades of the tunnel and construction of the new aerial structure between the Battery Street Tunnel and Pike Street. This detour will take southbound traffic off of SR 99 just north of the north portal of the Battery Street Tunnel. Traffic will be rerouted westward on Broad Street and continue west using a temporary trestle (over Elliott Avenue and the BNSF railroad tracks) to Alaskan Way surface street. The traffic will then merge with traffic on Alaskan Way surface street.

Land uses along Broad Street currently are mixed, but there are a few residential buildings. Most are offices, retail commercial businesses, or entertainment-related buildings at the Seattle Center. Broad Street is currently a four-lane principal arterial. The road is a boundary between the Uptown and the South Lake Union neighborhoods. The road crosses through the very north end of the Belltown neighborhood as it descends down the hill to the waterfront crossing First, Western, and Elliott Avenues. Buildings on both sides of Broad Street at First and Western Avenues are residential, including both market-rate apartment buildings and subsidized apartment units.

The effect of several years of substantial traffic volumes on Broad Street will be considerable for the residential Belltown neighborhood. The use of this arterial as a detour route will also result in a temporary reduction of on-street parking. The high volumes of traffic will not likely be perceived as a substantial adverse effect because of existing heavy traffic volumes on Broad Street. The loss of an estimated 30 on-street parking spaces could affect area businesses. The special events traffic to and from the Seattle Center, however, could create severe localized traffic congestion conditions due to the use of Broad Street as the major construction detour for southbound traffic off of Aurora Avenue N. This effect could reduce attendance at Seattle Center venues. In addition, there will be unavoidable neighborhood disruptions related to the use of a temporary aerial trestle over the railroad tracks. For additional information, please see Appendix P, Economics Technical Memorandum and Appendix C, Transportation Discipline Report.

Option: Battery Street Flyover Detour

The Battery Street Flyover Detour option is an alternative to the Broad Street Detour. This detour would convey both northbound and southbound traffic on SR 99 from the south portal of the Battery Street Tunnel onto a temporary aerial structure west of the existing structure and then would connect to a temporary viaduct along the waterfront. The flyover structure would go over existing buildings between Blanchard and Bell Streets located west of the existing aerial structure. Buildings under or adjacent to this temporary

structure would be affected, including the Art Institute as well as several residential buildings. The structure will be in place for several years. This detour will represent a substantial adverse effect on these buildings (residents and businesses), as the temporary structure will be much closer in proximity to the buildings than the existing aerial viaduct structure. In addition, the structure will be located above the Art Institute building, which could increase noise effects, though not as loud as underneath the existing double-level aerial structure. The use of this construction detour, however, will not cause a temporary reduction in on-street parking.

6.4.2 Mercer Street Underpass Construction Detours

Thomas Street Bridge Detour

The proposed Aerial Alternative includes widening of the Mercer Street underpass, which will require traffic to be detoured during these construction activities. The proposal is to construct a bridge across Aurora Avenue N. at Thomas Street. Traffic will be routed on this bridge and through the primarily light industrial land uses of the South Lake Union Neighborhood to access I-5. A specific route for this detour has not yet been decided, but will be determined as part of project permitting or through negotiations between the contractor and the City of Seattle. It is not anticipated that this construction detour will result in substantial adverse effects on social resources due to the current commercial and industrial character of the South Lake Union neighborhood. Moreover, the construction activities will require the elimination of an estimated 60 on-street parking spaces. The effect could change depending on the locations of proposed new commercial, office, and residential buildings.

Option: Thomas, Harris, Republican, and Roy Street Bridge Detours

The optional detour to the proposed single bridge crossing at Thomas Street is to construct several bridges across Aurora Avenue N. This detour would be required for the construction of the Lowered Aurora/SR 99 option for the north segment of the Aerial Alternative. As part of this proposal, new bridges across Aurora Avenue N. would be constructed at Thomas, Harris, Republican, and Roy Streets. During the construction of these bridges, traffic would continue to use the Mercer Street underpass. After completion, traffic would be diverted to the new bridges while construction occurred to convert the existing Mercer Street underpass to a bridge structure across Aurora Avenue N. The construction of these several new bridges across Aurora Avenue N. would allow traffic to have several alternative pathways across this primarily industrial and commercial neighborhood south of Lake Union. The specific order of construction of the new bridges and the specific route of

the detoured traffic during the construction period are undecided at this time. These details would be determined as part of the project permitting or in negotiations between the City of Seattle and the contractor. There are very few social resources in this neighborhood, and these construction-related effects would not likely be perceived as substantial adverse effects in the neighborhood.

6.5 Tunnel Alternative

For the Tunnel Alternative, potential construction-related effects on social resources will include all of the potential effects described above common to all of the Build Alternatives. In total, 33 social resources are adjacent to the construction zone and would be most affected by construction activities.

At the far north end of the project corridor, this alternative includes the proposal to widen the existing Mercer Street underpass. This will be accomplished using the proposed Thomas Street bridge detour described above for the Aerial Alternative. Construction of this alternative will include the same detours described above—the Broad Street Detour and the Battery Street Flyover Detour option. The construction-related effects on social resources for these detours are the same as described above for the Aerial Alternative.

6.6 Bypass Tunnel Alternative

For the Bypass Tunnel Alternative, potential construction-related effects on social resources will include all of the potential effects described above as common to all of the Build Alternatives. In total, 33 social resources are adjacent to the construction zone and will be most affected by construction activities.

At the far north end of the project corridor, the Bypass Tunnel Alternative includes the proposal to widen the existing Mercer Street underpass, the same action described for the Tunnel Alternative. This will be accomplished using the proposed Thomas Street bridge detour described above. Construction of this alternative will also include the same detour and option described above—the Broad Street Detour and the Battery Street Flyover Detour option. The option to construct multiple bridges across Aurora Avenue N., however, is not proposed for the Bypass Tunnel Alternative. Overall, the construction-related effects on social resources for these detours will be the same as described above for the Aerial Alternative.

6.7 Surface Alternative

For the Surface Alternative, potential construction-related effects on social resources will include all of the potential effects described above as common to all Build Alternatives. In total, 35 social resources are adjacent to the construction zone and will be most affected by construction activities. The Surface Alternative, however, also requires acquisition of property, which will require relocation of the International Longshoremen's and Warehousemen's Union (Local 19) offices.

Like the Tunnel and Bypass Tunnel Alternatives, the Surface Alternative also includes the proposal to widen the existing Mercer Street underpass. This will be accomplished using the proposed Thomas Street bridge detour described above. The construction of the alternative will include the Broad Street Detour and the Battery Street Tunnel Detour option.

Construction of bridges across Aurora Avenue N., however, is not proposed for this alternative. This alternative proposes instead the option of constructing multiple at-grade intersections on Aurora Avenue N. to allow traffic from the adjacent neighborhoods to cross the arterial and improve neighborhood interaction. Construction activities associated with this proposal are not expected to affect on-street parking. Overall, the construction-related effects on social resources for these detours are the same as described above for the other Build Alternatives.

Chapter 7 SECONDARY AND CUMULATIVE IMPACTS

This chapter discusses potential secondary and cumulative impacts of the AWW Project. Secondary effects are generally removed in time and distance from the proposed project. Cumulative effects are the additive effects of the proposed project with other reasonably foreseeable actions. For this project, these are effects that will occur either during or following the 7.5 to 11 years of construction associated with the Build Alternatives.

7.1 Secondary Impacts and Benefits

Secondary impacts are effects that are caused by the proposed project, but are indirectly related to the proposed project. They generally occur at a later point in time or may be farther removed in location, but are still reasonably foreseeable effects of the project. For example, operation of a proposed road project could stimulate downtown urban redevelopment and population increase, but that development would likely occur in the years following the completion of the project. The paragraphs below describe anticipated secondary impacts and benefits for each of the proposed project alternatives.

The proposed construction of the Build Alternatives will not require the acquisition of housing and only a very few social resources will be affected. The buildings on the properties needed for right-of-way acquisition include industrial, warehouse, office, and retail commercial businesses. The purchase of these properties, loss of existing land uses, and potential loss of parking spaces may change the mix of land uses within a neighborhood. But, the redevelopment of any residual land not required for project construction will occur consistent with the City Comprehensive Plan and zoning regulations. Considering the small number of properties to be acquired in this dense urban environment, changes to the general land use character of neighborhoods are not anticipated to substantially disrupt neighborhood cohesion. The social mix of workers, business owners, and residents may change slightly.

The engineering design of the Build Alternatives, especially the roadway profile, may affect the long-term desirability of existing properties or the redevelopment potential of properties. The vertical profile of the Build Alternatives could change the connectivity between downtown neighborhoods and between these neighborhoods and the waterfront. It is not anticipated that the Build Alternatives would affect any development project currently under review by the City of Seattle. The Rebuild and Aerial Alternatives are not expected to change the current linkage between the

waterfront, workers, and residents of downtown neighborhoods. Both of these alternatives have profiles similar to the existing viaduct.

The Tunnel and Bypass Tunnel Alternatives will result in the removal of the existing stacked aerial structure. This structure is currently a physical and visual obstruction between the waterfront and adjacent neighborhoods. Construction of either of the Tunnel or Bypass Tunnel alternative will likely improve neighborhood connectivity to the waterfront and increase the desirability of properties adjacent to the corridor. The removal of the existing elevated structure could indirectly result in an increase in property values immediately east of the Alaskan Way surface street. The increased desirability of properties will likely stimulate redevelopment which may change the character of adjacent neighborhoods and alter views. These changes will have mixed effects on neighborhood cohesion.

Similarly, the construction of the Surface Alternative will result in the removal of the existing aerial structure. This will enhance downtown views of Elliott Bay and could improve neighborhood connectivity to the waterfront. The removal of the existing structure also will provide an opportunity to develop an attractive landscaped waterfront boulevard. The alternative could stimulate construction of certain types of development due to removal of the elevated structures or could potentially discourage certain types of development due to traffic congestion. Compared to the two tunnel alternatives, the wider roadway and higher traffic volumes may discourage pedestrians from crossing Alaskan Way surface street. Neighborhood cohesion may or may not be affected long-term.

The number and location of on- and off-ramps for the proposed Build Alternatives may also affect where future development will occur in the project corridor. The Rebuild and Aerial Alternatives generally include the same on- and off-ramps as the existing structure. As such, these alternatives will not likely influence future development. The Surface Alternative will provide connectivity and access to downtown destinations. Together, these factors could result in changes in existing land use and/or types of future land development as allowed by City policy and zoning regulations. The Tunnel and Bypass Tunnel Alternatives generally do not have ramps to the downtown area, and as such, these alternatives are expected to increase congestion in areas to the north and south of downtown near where the alternatives have ramps. Plans to widen Mercer Street and/or re-connect one or more local streets across Aurora Avenue N. will improve connectivity between the Uptown and South Lake Union neighborhoods. This too could change long-term neighborhood character. Considering that neighborhoods downtown and south of downtown are primarily characterized as mixed,

commercial, and/or light industrial land uses, these changes will not likely be substantial adverse effects. The neighborhoods north of downtown are more residential in character, so such changes will likely be perceived as substantial effects. Such changes to existing neighborhood cohesion would likely be perceived as mixed, both adverse and beneficial.

In summary, many factors could affect the character of neighborhoods in the study area long after the completion of construction activities. Depending on what changes take place, the population, demographics, housing, and social resources could change substantially from current conditions. In turn, changes in the residential population of neighborhoods may lead to changes in amenities and services. Community facilities, particularly schools and childcare facilities, may relocate to the study area or out of the study area. Religious institutions and social and employment services may increase or decrease. All of these effects contribute to defining neighborhood cohesion.

7.2 Cumulative Impacts

Cumulative impacts are the total environmental effects of the proposed project combined with other actions. They can include both construction and/or operational effects.

For the proposed AWV Project, construction activities are anticipated to start in 2008. Site preparation and utility relocation activities, however, are anticipated to occur during the 18 months prior to the start of construction activities. The proposed roadway and seawall construction period will be approximately 7.5 to 11 years in duration, depending on the alternative. Therefore, potential construction-related activities could occur between 2008 and 2019, and project operation could begin as early as 2015, or as late as 2019.

During this period, there are many other projects planned in the project corridor. These projects are briefly described below. Following is an assessment of potential cumulative effects of the several projects combined with the proposed improvements for SR 99 and the seawall.

7.2.1 Other Proposed Actions

There are a number of large individual projects as well as many smaller proposed development projects that are located in the project corridor that, when combined with each other and the proposed AWV Project, could affect social resources in project corridor neighborhoods. These projects include several other transportation projects—the Central Link light rail project through the Seattle bus tunnel, the SR 519 connection to I-5, the Colman Dock Ferry Terminal expansion, improvement of the Mercer Street corridor, and construction of the Monorail along downtown city streets. The Seattle

Aquarium is proposed to be expanded, and there may be long-term redevelopment of Terminal 46. In addition, many small- to medium-sized residential, retail, and office projects are proposed for the Belltown/Queen Anne, South Lake Union, and downtown Seattle neighborhoods. A full description of these projects is contained in Appendix B, Alternatives Description and Construction Methods Technical Memorandum.

7.2.2 Potential Cumulative Effects

As briefly described above in Section 7.2.1, a substantial amount of urban development is currently proposed to occur near the project corridor. Some of this development will occur during the same time frame as construction of the proposed AWV Project. Some will occur beyond the construction phase of the proposed project. Both the construction and operation of these other projects combined with the proposed project construction and operation will result in cumulative effects on social resources in the study area.

Construction activities associated with the several other transportation and urban development projects would generally have a relatively short-term and localized effect. Projects limited to particular property, such as an office building or condominiums, would have construction traffic and noise that would affect perhaps several city blocks around the construction site and would generally be limited to daytime hours. The scale of the proposed AWV Project, however, is much bigger than these other projects, plus construction activities are proposed to occur 7 days per week and 24 hours per day. The duration of construction activities associated with the proposed project would also last many more years longer than most urban development projects.

Planned closure of the bus tunnel between 2007 and 2009 for the construction of the Central Link light rail project would overlap with site preparation, utility relocation, and initial construction activities associated with the proposed project. The initial construction activities include rebuilding of the seawall and SR 519 roadway construction. The bus tunnel closure would generally increase congestion on all downtown streets, which would exacerbate traffic congestion caused by the rebuilding or replacement of the viaduct, especially along the waterfront and in the stadium area. The overlap of these projects, however, would end in approximately 2010 with completion of the Central Link light rail project.

Construction effects of other projects combined with the proposed project would substantially increase traffic congestion on city streets, road closures, detours, and reduced on-street parking. The three proposed transportation projects (Monorail Green Line, Mercer Street Corridor, and SR 519) are long linear projects that are located in close proximity to the proposed project

corridor. The Mercer Street Corridor Project construction activities are proposed to extend through 2009, which would overlap with the proposed changes to Mercer Street at Aurora Avenue N. as well as the efforts to reconnect the local neighborhood street grid. Similarly, construction of the Monorail Green Line through the Uptown neighborhood and along Second Avenue in downtown Seattle would occur concurrent with proposed rebuilding of the seawall, just a couple of blocks away. In contrast, the construction effects of the SR 519 Project are contiguous with the proposed AWW Project, SR 519 ramps near S. Atlantic Street and S. Royal Brougham Way. As such, the concurrent construction activities of the Monorail and Mercer Street Corridor plus the subsequent construction of the SR 519 Project would cumulatively worsen the adverse effects for the first 4 to 5 years of construction on the proposed project.

In conclusion, the planned transportation projects crossing and adjacent to the project corridor would especially contribute and exacerbate disruptions to the neighborhoods. Pedestrian, vehicular, and transit access to and from neighborhoods in the study area would be affected by road closures and traffic detours required for the several concurrent construction projects. Access to individual buildings, offices, and shops would be affected.

Land uses as well as scale of buildings in the project corridor would be changing throughout the proposed project construction period. Such changes would especially be experienced in the Belltown, Queen Anne, South Lake Union, and downtown neighborhoods. The neighborhoods would have new residents and new places of employment. New community facilities, religious institutions, and cultural and social institutions would likely be built for new residents. New social and employment service providers would locate in neighborhoods. New government institutions, community centers, and public services would be established in new urban centers planned for downtown Seattle.

Overall, the movement and interactions between people would change as existing linkages within neighborhoods changed. In some cases, the unique character of some neighborhoods would change forever. The scope and magnitude of changes would affect neighborhood cohesion. The significance of these changes based on public perceptions could be regarded as long-term adverse or beneficial effects depending on a multitude of factors. Overall, however, cumulative adverse construction effects could be quite severe for some neighborhoods in the project corridor.

Cumulative operational effects would occur following the construction of the proposed project. Cumulative long-term effects examine the overall adverse and beneficial effects on neighborhoods, the community, and the larger

region. A number of transportation projects are proposed within the project corridor. All are being developed and designed to accommodate and meet the demand for transportation services associated with forecasted population and employment growth in the region. The long-term effects of the proposed AWV Project is one part of the regional transportation infrastructure and would not be expected to have substantial adverse effects on social resources above and beyond the cumulative beneficial effects of other planned and proposed projects.

The AWV Project and other proposed transportation projects would result in a number of specific benefits to the region. The proposed SR 519 interchange element of the proposed project would compliment the SR 519 Project to elevate Fourth Avenue S. and improve freeway connections to I-5. Similarly, the proposed widening of Mercer Street at Aurora Avenue N., adding bridges across Aurora Avenue N., and/or reconnecting the existing neighborhood street grid across Aurora Avenue N. all compliment and further improve the transportation improvements proposed as part of the Mercer Street Corridor Project, which extends between Aurora Avenue N. and I-5. Together, these two projects will improve connectivity and effectiveness for vehicular and transit movement in Seattle. The construction of the Monorail Green Line and Central Link light rail projects will both provide facilities to increase transit ridership to and from downtown Seattle. These projects will help to ensure long-term effectiveness of the roadway improvements proposed as part of the AWV Project as well, as other proposed roadway projects.

Together, these transportation projects will continue to provide transportation infrastructure for vehicles, transit, and freight movement to meet the needs of forecasted population growth in the region. These projects will continue to provide acceptable levels of service, connectivity to downtown Seattle, and access to community facilities, social and employment services, cultural and social institutions, and government institutions. The transportation infrastructure will continue to support the community and neighborhood cohesion that defines the uniqueness of Seattle's many downtown neighborhoods.

Chapter 8 OPERATIONAL MITIGATION

This chapter describes measures that could be implemented to mitigate potentially adverse effects on social resources. These include adverse effects on population, housing, community facilities, religious institutions, social and employment service agencies, cultural and social institutions, government institutions, and overall neighborhood cohesion.

As discussed in Chapter 5, operational impacts to social resources stem from a variety of changes in the community. Some of the alternatives will change how people in the region access the Seattle downtown area for entertainment or business activities. Property acquisition may displace businesses catering to local residents and/or workers who patronize neighborhood businesses. Some will change vehicular, transit, and pedestrian movement within and between downtown neighborhoods. Levels of traffic congestion and associated noise will change in some neighborhoods. Other alternatives will cause a reduction in on-street and/or off-street parking. All of these changes affect the interaction, behavior, routine, and daily patterns of people.

Individually or in combination, these changes in transportation infrastructure result in potential effects on social resources in the community. Changes in traffic routes, congestion, and travel times all affect real and perceived access to housing, community facilities, religious institutions, social services and employment, cultural and social institutions, and government institutions. Collectively, the linkages between all of these community assets define community characteristics and cohesion. In turn, the resulting community characteristics may be more or less desirable for some individuals and/or types of households.

The focus of mitigation for potential adverse social effects must address how adverse (negative) impacts on community can be avoided, minimized, or reduced. The first section identifies mitigation measures common to all of the Build Alternatives. Following are mitigation measures proposed for each of the Build Alternatives.

8.1 Mitigation Common to All Alternatives

The most important mitigation measure for all of the Build Alternatives is community outreach and communication. Changes in the transportation network cause people to get confused, anxious, or frustrated. These types of reactions are true for drivers in vehicles, transit passengers, and pedestrians. Moreover, repeated bad experiences can change future choices. The following

bullets identify community outreach and communication activities to educate and prepare the public for changes in their community.

Prior to opening the new facilities:

- Use newsletters, web pages, posters, newspaper inserts, television and radio public announcements, special neighborhood public meetings, and other similar methods of communication to announce to the general public the upcoming opening and use of the new roadway facilities. Publish these messages in non-English languages to accommodate Seattle and the region's very diverse population.
- Establish an interactive web page that will allow members of the public to map their trip in view of the new facilities. Locations of public parking lots and garages should be shown, as these facilities may change substantially following construction of the proposed project.
- Coordinate the opening of the facilities with other modes of transportation—bus, taxi, tour buses, light rail, trains, tourist industry, commercial trucking, railroads, and the airport. Both public and private transportation providers will need to know how to change operations and communicate these changes to their users. The public and the business community need to perceive that there is an integrated multi-modal public transportation system that will meet their transportation needs.
- Mass transit agencies should conduct special outreach activities to communicate new transit operations to members of the public who have mobility limitations and may be transit-dependent. Coordination efforts could be extended to social and employment service agencies that work with these special populations, as well as low-income and homeless populations.
- Install a substantial network of temporary signs, posters, and/or reader boards to guide vehicular or transit traffic the first several weeks or months after the opening of the new roadway facilities. Consider using a special opening-event logo or theme so signs are easily recognizable.
- Special consideration should be given to communicate changes in roadway operations for traffic associated with large sports events, cultural performances, and charity runs. Many of the attendees at these events live outside the Seattle downtown area and therefore may not use the new road facilities on a regular basis.

- Special signage should be posted to alert pedestrians to changes in pedestrian bridges and structures, including (1) the pedestrian bridge to the Colman Dock Ferry Terminal, (2) the Pike Street Hillclimb stairs from Alaskan Way surface street to the Pike Place Market, (3) the Lenora Street pedestrian bridge under the Alaskan Way Viaduct, and (4) the Bell Street pedestrian bridge across both the Alaskan Way Viaduct and surface street.
- To minimize adverse effects to neighborhood cohesion, please refer to mitigation measures identified the following related technical memoranda and discipline reports:
 - Appendix C, Transportation Discipline Report
 - Appendix F, Noise and Vibration Discipline Report
 - Appendix G, Land Use and Shorelines Technical Memorandum
 - Appendix H, Parks and Recreation Technical memorandum
 - Appendix J, Environmental Justice
 - Appendix K, Relocation Technical Memorandum
 - Appendix O, Public Services and Utilities Technical Memorandum
 - Appendix P, Economics Technical Memorandum
 - Appendix Q, Air Quality Discipline Report

8.2 Rebuild Alternative

Mitigation measures should include all those listed above common for the Build Alternatives. No additional operational mitigation measures are recommended.

8.3 Aerial Alternative

Mitigation measures should include all those listed above common for the Build Alternatives. In addition, the following measure s should be implemented:

- Work with community groups, residents, and businesses in the north segment, including the Lower Queen Anne and South Lake Union neighborhoods, to develop specific mitigation measures to take advantage of the proposed new linkages in the local street grid to encourage pedestrian access between the two neighborhoods, the Seattle Center, and the Lake Union shoreline.

8.4 Tunnel Alternative

Mitigation measures should include all those listed above common for the Build Alternatives. In addition, the following measures should be implemented:

- Coordinate with residents and businesses located in the south and north segments to develop specific mitigation measures to address the moderate to high levels of traffic congestion that will occur during peak periods due to the reduction in downtown ramps.
- Conduct community outreach activities with residents and businesses in the north waterfront along the Alaskan Way surface street to develop specific mitigation measures to reduce community disruptions caused by the proposed tunnel ramps near Pike Street.
- Work with community groups, residents, and businesses in the north segment, including the Lower Queen Anne and South Lake Union neighborhoods, to develop specific mitigation measures to take advantage of the proposed new linkages in the local street grid to encourage pedestrian access between the two neighborhoods, the Seattle Center, and the Lake Union shoreline.

8.5 Bypass Tunnel Alternative

Mitigation measures should include all those listed above common for the Build Alternatives. In addition, the following measures should be implemented:

- Coordinate with residents and businesses located in the south and north segments to develop specific mitigation measures to address the moderate to high levels of traffic congestion that will occur during peak periods due to the reduction in downtown ramps.
- Work with community groups, residents, and businesses in the north segment, including the Lower Queen Anne and South Lake Union neighborhoods, to develop specific mitigation measures to take advantage of the proposed new linkages in the local street grid to encourage pedestrian access between the two neighborhoods, the Seattle Center, and the Lake Union shoreline.

8.6 Surface Alternative

Mitigation measures should include all those listed above common for the Build Alternatives. In addition, the following measures should be implemented:

- Work with residents and businesses in close proximity to the Elliott/Western Avenue ramps to develop specific mitigation measures for increased congestion.
- Conduct community outreach activities with businesses and residents in the north waterfront along the Alaskan Way surface street to develop specific mitigation measures to reduce adverse effects caused by traffic congestion from the new surface street along the waterfront.
- Work with community groups, residents, and businesses in the north segment, including the Lower Queen Anne and South Lake Union neighborhoods, to develop specific mitigation measures to take advantage of the proposed new linkages in the local street grid to encourage pedestrian access between the two neighborhoods, the Seattle Center, and the Lake Union shoreline.

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Chapter 9 CONSTRUCTION MITIGATION

This section provides a list of recommended construction mitigation measures to avoid, lessen, or minimize potential adverse effects on social resources. Since the project construction area for all alternatives is nearly the same, specific mitigation measures are generally common to all alternatives.

The mitigation of potential impacts on social resources, however, will not necessarily address all effects affecting social resources. As discussed earlier, potential construction-related effects on neighborhood cohesion are affected by other environmental elements. Adverse effects from changes in traffic, parking, changes in land use, relocation of businesses, as well as noise levels and air quality cumulatively affect the overall social environment defining how neighborhood residents, workers, and visitors interact. For these reasons, it is important to review construction mitigation measures identified in other project technical memorandum and discipline reports to fully understand the scope of mitigation measures needed to avoid, lessen, or minimize potential adverse effects on social resources.

9.1 Mitigation Common to All Alternatives

9.1.1 Population and Housing

General

- Establish neighborhood advisory groups prior to the start of construction activities to solicit input for mitigation measures. Periodically during construction, meet with these neighborhood representatives to communicate important information concerning construction activities and to inquire if mitigation measures are effective and meet public expectations. Separate groups could be established for special types of organizations such as community facilities, religious institutions, social and employment services, cultural and social institutions, government institutions, and others.
- Prior to the start of construction activities and periodically during construction, hold neighborhood public meetings to advise the public of planned construction activities, road closures, traffic detours, changes in pedestrian walkways, etc. Representatives of project corridor community facilities, religious institutions, social and employment services, cultural and social institutions, government institutions, and others should be included on the mailing list for such events.

- Periodically publish a project newsletter to alert members of the public of planned construction activities, road closures, traffic detours, changes in public transit routes, etc. Newsletters will be published in appropriate languages to effectively communicate with project area residents. Newsletters can be distributed at area community centers, schools, libraries, and other such places. Newsletters should also be posted on a project web page.
- Provide project corridor social resources with the name(s) of one or more contacts with whom representatives may communicate concerns related to construction activities.
- Establish a community telephone and/or Internet hotline so that any and all members of the public can directly report problems related to construction activities and problems can be addressed promptly.
- Mark pedestrian pathways and dangerous areas in the construction area to ensure public safety. Monitor installed signage during construction to ensure that it is effective.

All Residents

- Coordinate with neighborhood groups, including residents living in close proximity to the project corridor construction zone and staging areas, to develop appropriate mitigation measures for the extended duration of potential 24-hour impacts from construction-related noise, light and glare, and dust impacts.
- Develop special news bulletins to communicate upcoming construction activities to residents living in close proximity to the project construction zone and potential staging areas.

Low-Income Persons

- Prior to the start of construction, work with representatives of the low-income population, either directly or through representatives of agencies providing services to this population, to develop specific mitigation measures pertinent to this population residing in the project area.
- Periodically meet with representatives of the low-income population during the construction period to ensure that implemented mitigation measures are effective.
- Conduct outreach communication with representatives of area homeless shelters and related social service organizations prior to the start of construction activities to develop specific mitigation measures for the special needs population. Coordinate with these

representatives during the construction period to ensure that implemented mitigation measures are effective.

- Prior to the start of construction activities, coordinate with representatives of the homeless and special needs populations, either directly or with representatives of organizations serving these populations, to identify specific mitigation measures for this affected population.

9.1.2 Community Facilities and Religious Institutions

- Work with representatives of religious institutions located in close proximity to the project corridor construction zone to develop mitigation measures to address noise impacts that may affect services, meditation sessions, or other events.

9.1.3 Social and Employment Services

- Work with representatives of the Millionaire Club Charity to develop a plan for temporary relocation of their casual day labor program to a location that allows this program to effectively continue during the construction period.

9.1.4 Cultural and Social Institutions

- Work with representatives of the Seattle Center, Safeco Field, Seahawks Stadium, and the Exhibition Center to develop specific mitigation measures to address vehicular and transit access and parking issues related to workers as well as large event attendance.
- Coordinate with cultural and social institutions to develop specific mitigation measures for venues where construction-related noise will result in adverse effects.

9.1.5 Government Institutions

No additional mitigation measures are recommended for government institutions.

9.1.6 Neighborhood Cohesion

To minimize adverse effects to neighborhood cohesion, please refer to mitigation measures identified the following related technical memoranda and discipline reports:

Appendix C, Transportation Discipline Report

Appendix F, Noise and Vibration Discipline Report

Appendix G, Land Use and Shorelines Technical Memorandum
Appendix H, Parks and Recreation Technical memorandum
Appendix J, Environmental Justice
Appendix K, Relocation Technical Memorandum
Appendix O, Public Services and Utilities Technical Memorandum
Appendix P, Economics Technical Memorandum
Appendix Q, Air Quality Discipline Report

9.2 Rebuild Alternative

Construction mitigation measures are the same as recommended for all Build Alternatives.

9.3 Aerial Alternative

Construction mitigation measures include all the same recommended for all of the Build Alternatives. The following mitigation measure is recommended in addition to those common to all Build Alternatives:

- Work with residents, businesses, and other organizations to develop specific mitigation measures to address adverse effects from the operation of the Battery Street Tunnel construction detours or Mercer Street Underpass construction detours. Particular attention should be given to identify appropriate routes for detours through the South Lake Union neighborhood.

9.4 Tunnel Alternative

Construction mitigation measures include those recommended for all of the Build Alternatives plus the additional mitigation measure recommended for the Aerial Alternative.

9.5 Bypass Tunnel Alternative

Construction mitigation measures include those recommended for all of the Build Alternatives plus the additional mitigation measure recommended for the Aerial Alternative.

9.6 Surface Alternative

Construction mitigation measures include all those recommended for all of the Build Alternatives plus the additional mitigation measure recommended for the Aerial Alternative. In addition, the following mitigation measure is recommended:

- Work with representatives of the Longshoremen's and Warehousemen's Union (Local 19) to identify potential sites to relocate. Please refer to other related mitigation measures identified in Appendix K, Relocations Technical Memorandum.

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ATTACHMENT A

Street Maps of the Project Study Area

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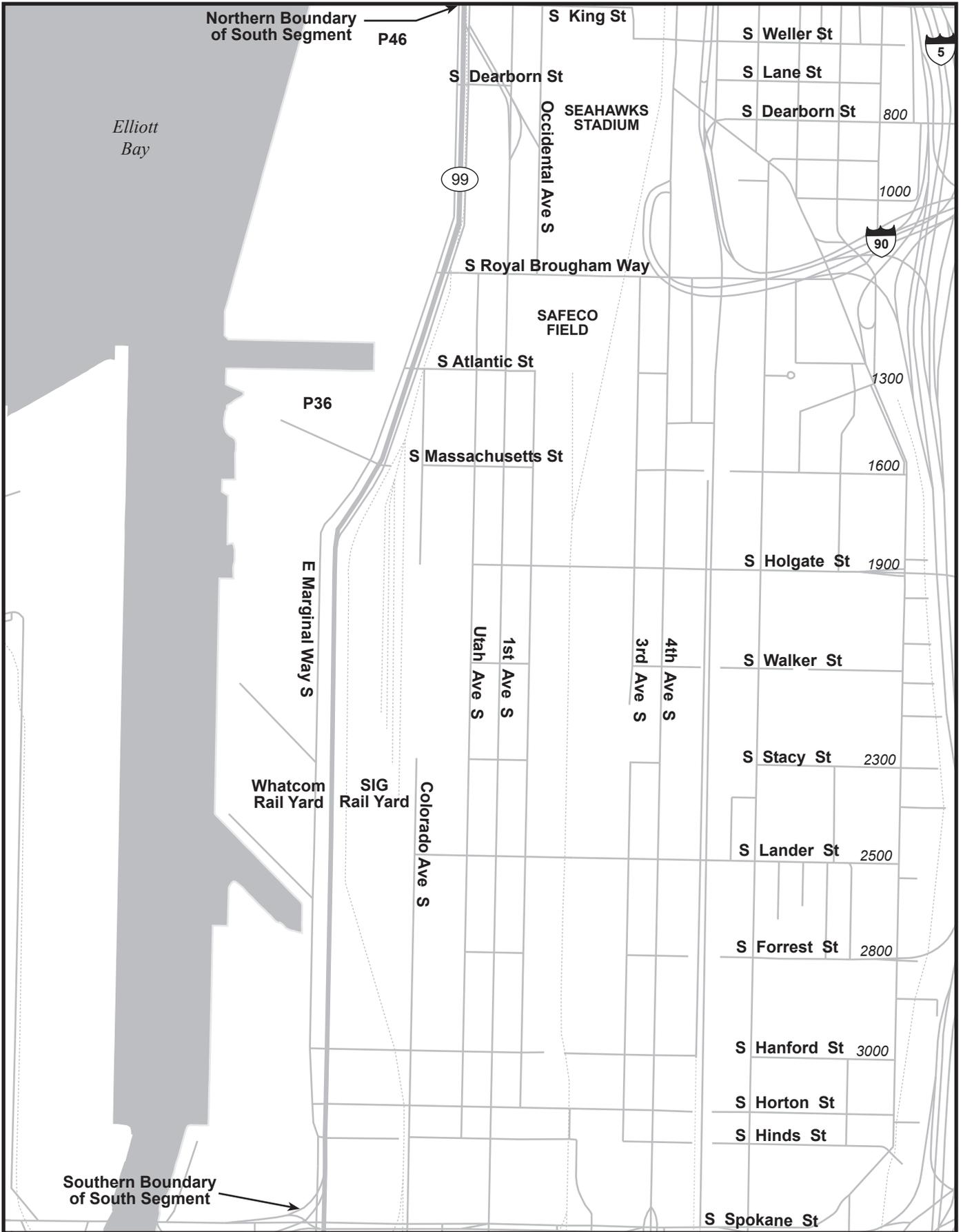
Street Maps of the Project Study Area

A-1. South segment: Street Map

A-2. Central segment: Street Map

A-3. North and North Waterfront segments: Street Map

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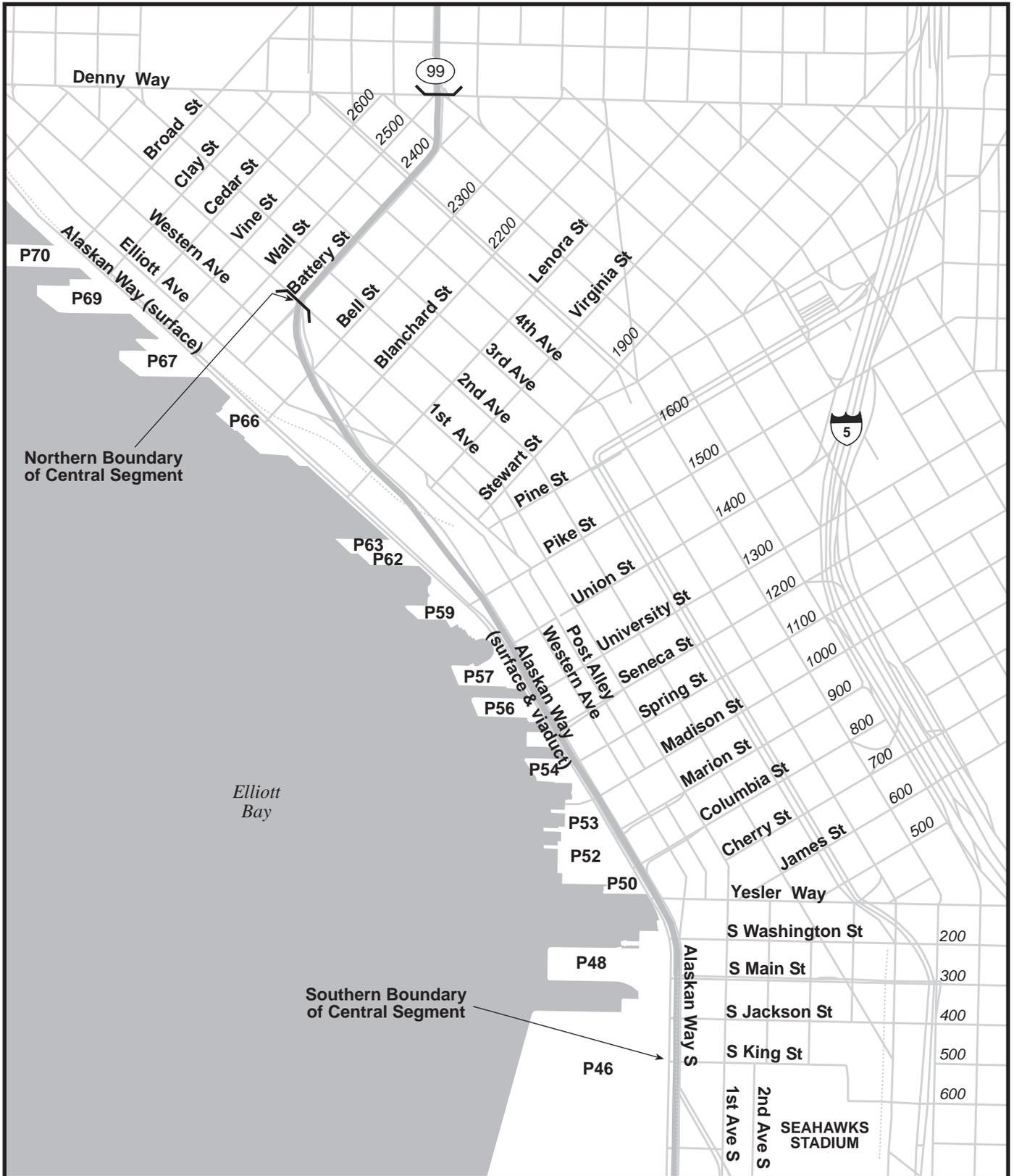


Alaskan Way Viaduct/554-1585-025/06(0620) 10/03 (K)



P46 = Pier 46

**Appendix A-1
South Segment: Street Map**



Alaskan Way Viaduct/554-1585-025/06(0620) 2/04 (K)



P46 = Pier 46

Appendix A-2 Central Segment: Street Map



Alaskan Way Viaduct/554-1585-025/06(0620) 2/04 (K)



P57 = Pier 57

**Appendix A-3
Waterfront Segments: Street Map**

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ATTACHMENT B

**Detailed Population and Demographic Characteristics of the
Project Study Area**

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Detailed Population and Demographic Characteristics of the Project Study Area

- B-1. Historic Population Growth in the Project Study Area, 1990 & 2000
- B-2. Racial and Ethnic Population Demographics of the Project Study Area, 1990
- B-3. Racial and Ethnic Population Demographics of the Project Study Area, 2000
- B-4. Household Language Characteristics of the Project Study Area, 1990
- B-5. Household Language Characteristics of the Project Study Area, 2000
- B-6. Population Age Characteristics of the Project Study Area, 1990
- B-7. Population Age Characteristics of the Project Study Area, 2000
- B-8. Household Characteristics of the Project Study Area, 1990
- B-9. Household Characteristics of the Project Study Area, 2000
- B-10. Household Income Characteristics of the Project Study Area, 1990
- B-11. Household Income Characteristics of the Project Study Area, 2000
- B-12. Population Mobility Disability Characteristics of the Project Study Area, 2000
- B-13. Household Transit Dependency Characteristics of the Project Study Area, 2000
- B-14. Housing Characteristics of the Project Study Area, 1990
- B-15. Housing Characteristics of the Project Study Area, 2000

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ATTACHMENT B-1

Historic Population Growth in the Project Study Area, 1990 & 2000

Area	1990 Census			2000 Census			Difference	Percent Change
	1990 Census Tract	Block Group	Total Population	2000 Census Tract	Block Group	Total Population		
Project Study Area	67.98	2	564	67	2	609		
		<i>Subtotal</i>	564		<i>Subtotal</i>	609	45	108%
	71	1	82	71	2	919		
		2	697					
		<i>Subtotal</i>	779		<i>Subtotal</i>	919	140	118%
	72	1	39	72	1	495		
		2	225					
		4	120					
		<i>Subtotal</i>	384		<i>Subtotal</i>	495	111	129%
	72	3	1,326	72	2	2,589		
		<i>Subtotal</i>	1,326		<i>Subtotal</i>	2,589	1,263	195%
	80	1	1,089	80.01	1	767		
					2	1,498		
		<i>Subtotal</i>	1,089		<i>Subtotal</i>	2,265	1,176	208%
	80	2	1,610	80.02	1	1,618		
					2	1,144		
		<i>Subtotal</i>	1,610		<i>Subtotal</i>	2,762	1,152	172%
	80	3	340	80.01	3	1,145		
	80.99	3	10					
		<i>Subtotal</i>	350		<i>Subtotal</i>	1,145	795	327%
	81	3	93	81	1	2,431		
		4	935					
		<i>Subtotal</i>	1,028		<i>Subtotal</i>	2,431	1,403	236%
	81	1	45	81	2	1,046		
		2	771					
		<i>Subtotal</i>	816		<i>Subtotal</i>	1,046	230	128%
92	2	441	92	2	911			
	3	495						
	<i>Subtotal</i>	936		<i>Subtotal</i>	911	(25)	97%	
93	8	361	93	2	667			
93.99	8	282						
	<i>Subtotal</i>	643		<i>Subtotal</i>	667	24	104%	
Total		9,525			15,839	6,314	166%	
City of Seattle		516,259			563,374	47,115	109%	

Source: 1990 Census, STF 1, P001; 2000 Census, SF 1, P1.

Notes:

1. Census Tract 80.99 Block Group 3 includes those residents who live on boats in Census Tract 80 Block Group 3 in 1990.
2. Census Tract 93.99 Block Group 8 includes those residents who live on boats in Census Tract 93 Block Group 8 in 1990.

ATTACHMENT B-2

Racial and Ethnic Population Demographics of the Project Study Area, 1990

1990 Census Tract	Block Group	Total Population	Am.Ind., Eskimo, & Aleut					Asian or Pac. Is.	Other Race	Percent Non-White	Hispanic Origin	Percent Hispanic Origin
			White	Black								
67.98	2	564	468	29	6	32	11			19		
	<i>Subtotal</i>	564	468	29	6	32	11	14%		19	3%	
71	1	82	50	26	-	2	4			5		
	2	697	597	25	18	35	22			40		
	<i>Subtotal</i>	779	647	51	18	37	26	17%		45	6%	
72	1	39	28	8	-	3	-			2		
	2	225	189	23	3	8	2			13		
	4	120	106	3	2	8	1			2		
	<i>Subtotal</i>	384	323	34	5	19	3	16%		17	4%	
72	3	1,326	1,149	73	30	52	22			47		
	<i>Subtotal</i>	1,326	1,149	73	30	52	22	13%		47	4%	
80	1	1,089	924	65	26	64	10			32		
	<i>Subtotal</i>	1,089	924	65	26	64	10	15%		32	3%	
80	2	1,610	1,373	127	45	47	18			50		
	<i>Subtotal</i>	1,610	1,373	127	45	47	18	15%		50	3%	
80	3	340	281	30	11	16	2			16		
80.99	3	10	10	-	-	-	-			-		
	<i>Subtotal</i>	350	291	30	11	16	2	17%		16	5%	
81	3	93	65	17	5	5	1			3		
	4	935	803	45	28	55	4			22		
	<i>Subtotal</i>	1,028	868	62	33	60	5	16%		25	2%	
81	1	45	40	3	-	2	-			-		
	2	771	445	239	41	11	35			106		
	<i>Subtotal</i>	816	485	242	41	13	35	41%		106	13%	
92	2	441	271	131	14	20	5			24		
	3	495	356	94	25	8	12			71		
	<i>Subtotal</i>	936	627	225	39	28	17	33%		95	10%	
93	8	361	261	59	32	2	7			24		
93.99	8	282	257	11	4	6	4			9		
	<i>Subtotal</i>	643	518	70	36	8	11	19%		33	5%	
Project Study Area		9,525	7,673	1,008	290	376	160	19%		937	10%	
			81%	11%	3%	4%	2%					
City of Seattle		516,259	388,858	51,948	7,326	60,819	7,308	25%		18,349	4%	
			75%	10%	1%	12%	1%					

Source: 1990 Census, STF 1, P006 and P008.

Notes:

1. Am. Ind. = American Indian.
2. Pac. Is. = Pacific Islander.
3. Census Tract 80.99 Block Group 3 includes those residents that live on boats in Census Tract 80 Block Group 3 in 1990.
4. Census Tract 93.99 Block Group 8 includes those residents that live on boats in Census Tract 93 Block Group 8 in 1990.
5. Sums may not total to 100 percent due to rounding.

ATTACHMENT B-3

Racial and Ethnic Population Demographics of the Project Study Area, 2000

2000 Census Tract	Block Group	Total Population	Black or African Am.		Am. Ind. & AK Nat.		Nat. HI & Pac. Is.	Other Race Alone	Two or More Races	Percent Non-White	Hispanic or Latino	Percent Hispanic/Latino
			White			Asian						
67	2	609	517	21	5	40	1	6	19		27	
	<i>Subtotal</i>	609	517	21	5	40	1	6	19	15%	27	4%
71	2	919	764	33	18	48	3	24	29		60	
	<i>Subtotal</i>	919	764	33	18	48	3	24	29	17%	60	7%
72	1	495	371	38	21	30	2	15	18		41	
	<i>Subtotal</i>	495	371	38	21	30	2	15	18	25%	41	8%
72	2	2,589	2,061	129	32	211	2	53	101		124	
	<i>Subtotal</i>	2,589	2,061	129	32	211	2	53	101	20%	124	5%
80.01	1	767	633	23	5	87	2	3	14		20	
	2	1,498	1,094	173	17	128	2	24	60		66	
	<i>Subtotal</i>	2,265	1,727	196	22	215	4	27	74	24%	86	4%
80.02	1	1,618	1,179	165	51	100	4	38	81		105	
	2	1,144	844	113	17	103	4	16	47		38	
	<i>Subtotal</i>	2,762	2,023	278	68	203	8	54	128	27%	143	5%
80.01	3	1,145	830	113	31	83	1	34	53		88	
	<i>Subtotal</i>	1,145	830	113	31	83	1	34	53	28%	88	8%
81	1	2,431	1,829	208	32	197	6	52	107		139	
	<i>Subtotal</i>	2,431	1,829	208	32	197	6	52	107	25%	139	6%
81	2	1,046	594	260	69	35	4	27	57		328	
	<i>Subtotal</i>	1,046	594	260	69	35	4	27	57	43%	328	31%
92	2	911	554	165	36	59	2	30	65		97	
	<i>Subtotal</i>	911	554	165	36	59	2	30	65	39%	97	11%
93	2	667	431	104	43	29	1	40	19		67	
	<i>Subtotal</i>	667	431	104	43	29	1	40	19	35%	67	10%
Project Study Area		15,839	11,701	1,545	377	1,150	34	362	670	26%	1,200	8%
			74%	10%	2%	7%	0%	2%	4%			
City of Seattle		563,374	394,889	47,541	5,659	73,910	2,804	13,423	25,148	30%	29,719	5%
			70%	8%	1%	13%	0%	2%	4%			

Source: 2000 Census, SF 1, P3 and P4.

Notes:

1. African Am. = African American.
2. Am. Ind. = American Indian.
3. AK Nat. = Alaskan Native.
4. Nat. HI = Native Hawaiian.
5. Pac. Is. = Pacific Islander.
6. Sums may not total 100 percent due to rounding.

ATTACHMENT B-4

Household Language Characteristics of the Project Study Area, 1990

Census 1990 Tract	Block Group	HH Predicted	English Only	Spanish	Asian & Pacific Islander	Speak Other Languages	Linguistically Isolated
67.98	2	392	334	18	13	27	20
	<i>Subtotal</i>	392	334	18	13	27	20
			85%				5%
71	1	20	17	-	-	3	-
	2	524	446	42	9	27	23
	<i>Subtotal</i>	544	463	42	9	30	23
			85%				4%
72	1	30	30	-	-	-	-
	2	181	143	7	10	21	7
	4	91	91	-	-	-	-
	<i>Subtotal</i>	302	264	7	10	21	7
			87%				2%
72	3	1,179	1,017	17	36	109	23
	<i>Subtotal</i>	1,179	1,017	17	36	109	23
			86%				2%
80	1	758	635	19	80	24	15
	<i>Subtotal</i>	758	635	19	80	24	15
			84%				2%
80	2	1,216	1,157	10	-	49	8
	<i>Subtotal</i>	1,216	1,157	10	-	49	8
			95%				1%
80	3	270	254	-	7	9	9
80.99	3	-	-	-	-	-	-
	<i>Subtotal</i>	270	254	-	7	9	9
			94%				3%
81	3	41	28	-	13	-	13
	4	743	641	29	25	48	14
	<i>Subtotal</i>	784	669	29	38	48	27
			85%				3%
81	1	16	16	-	-	-	-
	2	233	203	6	17	7	-
	<i>Subtotal</i>	249	219	6	17	7	-
			88%				0%
92	2	251	232	8	11	-	8
	3	130	130	-	-	-	-
	<i>Subtotal</i>	381	362	8	11	-	8
			95%				2%
93	8	29	29	-	-	-	-
93.99	8	-	-	-	-	-	-
	<i>Subtotal</i>	29	29	-	-	-	-
			100%				0%
Project Study Area		6,104	5,403	156	221	324	140
			89%	3%	4%	5%	2%
City of Seattle		236,908	199,280	6,429	16,985	14,214	9,110
			84%	3%	7%	6%	4%

Sources: 1990 U.S. Census, STF 3, P029.

Notes:

1. HH Predicted = Total number of households for which data was predicted based on the sample survey.
Household statistics in other tables are from STF 1 and are actual counts based on the 100 percent census.
2. A linguistically isolated household is one in which no member 14 years or older speaks only English or speaks a non-English language and speaks English "very well."
3. Census Tract 80.99 Block Group 3 includes those residents who live on boats in Census Tract 80 Block Group 3 in 1990.
4. Census Tract 93.99 Block Group 8 includes those residents who live on boats in Census Tract 93 Block Group 8 in 1990.
5. Percentages may not sum to 100 percent due to rounding.

ATTACHMENT B-5

Household Language Characteristics of the Project Study Area, 2000

Tract	Block Group	HH Estimated	English Only	Spanish	Asian & Pacific Islander	Other Indo-European	Other Languages	Speak Other Languages	Linguistically Isolated
67	2	414	359	10	7	38	-	38	-
	<i>Subtotal</i>	414	359	10	7	38	-	38	-
			87%						0%
71	2	689	616	28	10	28	7	35	25
	<i>Subtotal</i>	689	616	28	10	28	7	35	25
			89%						4%
72	1	328	298	5	7	18	-	18	7
	<i>Subtotal</i>	328	298	5	7	18	-	18	7
			91%						2%
72	2	1,734	1,371	85	142	126	10	136	100
	<i>Subtotal</i>	1,734	1,371	85	142	126	10	136	100
			79%						6%
80.01	1	478	420	33	17	8	-	8	33
	2	1,181	985	24	72	100	-	100	29
	<i>Subtotal</i>	1,659	1,405	57	89	108	-	108	62
			85%						4%
80.02	1	1,004	925	11	38	18	12	30	30
	2	859	688	19	74	59	19	78	52
	<i>Subtotal</i>	1,863	1,613	30	112	77	31	108	82
			87%						4%
80.01	3	752	669	-	51	16	16	32	47
	<i>Subtotal</i>	752	669	-	51	16	16	32	47
			89%						6%
81	1	1,404	1,109	78	87	112	18	130	66
	<i>Subtotal</i>	1,404	1,109	78	87	112	18	130	66
			79%						5%
81	2	552	473	19	-	24	36	60	55
	<i>Subtotal</i>	552	473	19	-	24	36	60	55
			86%						10%
92	2	441	340	26	28	30	17	47	54
	<i>Subtotal</i>	441	340	26	28	30	17	47	54
			77%						12%
93	2	120	115	-	-	5	-	5	-
	<i>Subtotal</i>	120	115	-	-	5	-	5	-
			96%						0%
Project Study Area		9,956	8,368	338	533	582	135	717	498
			84%	3%	5%	6%	1%	7%	5%
City of Seattle		258,635	205,381	11,636	23,047	14,505	4,066	18,571	13,590
			79%	4%	9%	6%	2%	7%	5%

Sources: 2000 U.S. Census, SF 3, P20.

Notes:

1. HH Estimated = Total number of households for which data was predicted based on the sample survey.
2. A linguistically isolated household is one in which no member 14 years or older speaks only English or speaks a non-English language and speaks English "very well."
3. Percentages may not sum to 100 percent due to rounding.

ATTACHMENT B-6

Population Age Characteristics of the Project Study Area, 1990

1990 Census Tract	Block Group	Total Population	0-4 yrs.		5-17 yrs.		18-64 yrs.		65 and older	
				%		%		%		%
67.98	2	564	15		20		449		80	
	<i>Subtotal</i>	564	15	3%	20	4%	449	80%	80	14%
71	1	82	9		10		50		13	
	2	697	8		17		565		107	
	<i>Subtotal</i>	779	17	2%	27	3%	615	79%	120	15%
72	1	39	1		2		32		4	
	2	225	2		-		183		40	
	4	120	-		4		100		16	
	<i>Subtotal</i>	384	3	1%	6	2%	315	82%	60	16%
72	3	1,326	13		13		742		558	
	<i>Subtotal</i>	1,326	13	1%	13	1%	742	56%	558	42%
80	1	1,089	9		11		890		179	
	<i>Subtotal</i>	1,089	9	1%	11	1%	890	82%	179	16%
80	2	1,610	9		11		1,259		331	
	<i>Subtotal</i>	1,610	9	1%	11	1%	1,259	78%	331	21%
80	3	340	2		2		251		85	
80.99	3	10	-		-		10		-	
	<i>Subtotal</i>	350	2	1%	2	1%	261	75%	85	24%
81	3	93	4		8		75		6	
	4	935	9		20		710		196	
	<i>Subtotal</i>	1,028	13	1%	28	3%	785	76%	202	20%
81	1	45	2		2		35		6	
	2	771	2		17		711		41	
	<i>Subtotal</i>	816	4	0%	19	2%	746	91%	47	6%
92	2	441	-		1		372		66	
	3	495	5		7		476		7	
	<i>Subtotal</i>	936	5	1%	8	1%	848	91%	73	8%
93	8	361	-		-		331		30	
93.99	8	282	-		1		281		-	
	<i>Subtotal</i>	643	-	0%	1	0%	612	95%	30	5%
Project Study Area		9,525	90	1%	146	2%	7,522	79%	1,765	19%
City of Seattle		516,259	29,269	6%	55,661	11%	352,929	68%	78,400	15%

Source: 1990 Census, STF 1, P011.

Notes:

1. Census Tract 80.99 Block Group 3 includes those residents that live on boats in Census Tract 80 Block Group 3 in 1990.
2. Census Tract 93.99 Block Group 8 includes those residents that live on boats in Census Tract 93 Block Group 8 in 1990.
3. Sums may not total 100 percent due to rounding.

ATTACHMENT B-7

Population Age Characteristics of the Project Study Area, 2000

2000 Census Tract	Block Group	Total Population	0-4 yrs.		5-17 yrs.		18-64 yrs.		65 and older	
				%		%		%		%
67	2	609	11		9		545		44	
	<i>Subtotal</i>	609	11	2%	9	1%	545	89%	44	7%
71	2	919	19		15		831		54	
	<i>Subtotal</i>	919	19	2%	15	2%	831	90%	54	6%
72	1	495	3		15		446		31	
	<i>Subtotal</i>	495	3	1%	15	3%	446	90%	31	6%
72	2	2,589	22		30		2,113		424	
	<i>Subtotal</i>	2,589	22	1%	30	1%	2,113	82%	424	16%
80.01	1	767	6		19		630		112	
	2	1,498	25		17		1,354		102	
	<i>Subtotal</i>	2,265	31	1%	36	2%	1,984	88%	214	9%
80.02	1	1,618	22		27		1,305		264	
	2	1,144	13		13		1,035		83	
	<i>Subtotal</i>	2,762	35	1%	40	1%	2,340	85%	347	13%
80.01	3	1,145	9		21		1,056		59	
	<i>Subtotal</i>	1,145	9	1%	21	2%	1,056	92%	59	5%
81	1	2,431	53		81		1,892		405	
	<i>Subtotal</i>	2,431	53	2%	81	3%	1,892	78%	405	17%
81	2	1,046	3		20		964		59	
	<i>Subtotal</i>	1,046	3	0%	20	2%	964	92%	59	6%
92	2	911	10		13		831		55	
	<i>Subtotal</i>	911	10	1%	13	1%	831	91%	55	6%
93	2	667	6		16		592		53	
	<i>Subtotal</i>	667	6	1%	16	2%	592	89%	53	8%
Project Study Area		15,839	202	1%	296	2%	13,594	86%	1,745	11%
City of Seattle		563,374	26,215	5%	61,612	11%	407,740	72%	67,807	12%

Source: 2000 Census, SF 1, P12.

Note:

1. Sums may not total 100 percent due to rounding.

ATTACHMENT B-8

Household Characteristics of the Project Study Area, 1990

1990 Census Tract	Block Group					Family HH with Children <18 yrs.		Single-Parent Family HH with Children <18 yrs.		Elderly >64 yrs. Householder			
		Pop.	HH	1-Per HH	%	Family HH	%		%		%		
67.98	2	564	373	218		99		22		18		61	
	<i>Subtotal</i>	564	373	218	58%	99	27%	22	6%	18	5%	61	16%
71	1	82	34	27		4		1		-		9	
	2	697	528	389		74		18		10		97	
	<i>Subtotal</i>	779	562	416	74%	78	14%	19	3%	10	2%	106	19%
72	1	39	19	9		3		-		-		3	
	2	225	187	150		18		2		1		38	
	4	120	94	73		10		2		1		12	
	<i>Subtotal</i>	384	300	232	77%	31	10%	4	1%	2	1%	53	18%
72	3	1,326	1,115	937		108		18		12		515	
	<i>Subtotal</i>	1,326	1,115	937	84%	108	10%	18	2%	12	1%	515	46%
80	1	1,089	810	565		169		18		5		138	
	<i>Subtotal</i>	1,089	810	565	70%	169	21%	18	2%	5	1%	138	17%
80	2	1,610	1,220	978		173		15		5		298	
	<i>Subtotal</i>	1,610	1,220	978	80%	173	14%	15	1%	5	0%	298	24%
80	3	340	261	213		17		3		2		81	
80.99	3	10	-	-		-		-		-		-	
	<i>Subtotal</i>	350	261	213	82%	17	7%	3	1%	2	1%	81	31%
81	3	93	36	22		13		1		-		5	
	4	935	675	522		106		14		5		179	
	<i>Subtotal</i>	1,028	711	544	77%	119	17%	15	2%	5	1%	184	26%
81	1	45	24	15		7		1		-		6	
	2	771	244	234		4		1		-		33	
	<i>Subtotal</i>	816	268	249	93%	11	4%	2	1%	-	0%	39	15%
92	2	441	252	226		18		1		1		58	
	3	495	129	84		14		2		1		1	
	<i>Subtotal</i>	936	381	310	81%	32	8%	3	1%	2	1%	59	15%
93	8	361	23	11		9		-		-		1	
93.99	8	282	-	-		-		-		-		-	
	<i>Subtotal</i>	643	23	11	48%	9	39%	-	0%	-	0%	1	4%
Project Study Area		9,525	6,024	4,673	78%	846	14%	119	2%	61	1%	1,535	25%
City of Seattle		516,259	236,702	94,179	40%	112,969	48%	47,629	20%	3,630	2%	52,931	22%

Sources: 1990 Census, STF 1, P001, P002, P003, P016, P018, H012.

Notes:

1. Pop. = Population.
2. HH = Household.
3. 1-per HH = One person households.
4. Family HH = Households with more than one person related by blood or marriage or adoption.
5. Census Tract 80.99 Block Group 3 includes those residents that live on boats in Census Tract 80 Block Group 3 in 1990.
6. Census Tract 93.99 Block Group 8 includes those residents that live on boats in Census Tract 93 Block Group 8 in 1990.
7. Percentages may not sum to 100 percent due to rounding.

ATTACHMENT B-9

Household Characteristics of the Project Study Area, 2000

2000 Census Tract	Block Group	Pop.	HH	1-Per HH	Family HH		Family HH with Children <18 yrs.		Single-Parent Family HH with Children <18 yrs.		Elderly >64 yrs. Householder		
					%	%	%	%	%	%			
67	2	609	408	239		90		15		9		32	
	<i>Subtotal</i>	609	408	239	59%	90	22%	15	4%	9	2%	32	8%
71	2	919	672	499		73		14		4		46	
	<i>Subtotal</i>	919	672	499	74%	73	11%	14	2%	4	1%	46	7%
72	1	495	331	272		27		6		3		24	
	<i>Subtotal</i>	495	331	272	82%	27	8%	6	2%	3	1%	24	7%
72	2	2,589	1,819	1,437		210		39		20		365	
	<i>Subtotal</i>	2,589	1,819	1,437	79%	210	12%	39	2%	20	1%	365	20%
80.01	1	767	529	327		156		15		8		80	
	2	1,498	1,073	830		156		32		19		71	
	<i>Subtotal</i>	2,265	1,602	1,157	72%	312	19%	47	3%	27	2%	151	9%
80.02	1	1,618	1,066	768		173		33		20		205	
	2	1,144	841	579		132		20		9		63	
	<i>Subtotal</i>	2,762	1,907	1,347	71%	305	16%	53	3%	29	2%	268	14%
80.01	3	1,145	757	569		114		21		17		53	
	<i>Subtotal</i>	1,145	757	569	75%	114	15%	21	3%	17	2%	53	7%
81	1	2,431	1,444	997		345		41		16		266	
	<i>Subtotal</i>	2,431	1,444	997	69%	345	24%	41	3%	16	1%	266	18%
81	2	1,046	518	483		17		7		6		33	
	<i>Subtotal</i>	1,046	518	483	93%	17	3%	7	1%	6	1%	33	6%
92	2	911	431	323		51		13		9		40	
	<i>Subtotal</i>	911	431	323	75%	51	12%	13	3%	9	2%	40	9%
93	2	667	139	68		45		4		2		8	
	<i>Subtotal</i>	667	139	68	49%	45	32%	4	3%	2	1%	8	6%
Project Study Area		15,839	10,028	7,391	74%	1,589	16%	260	3%	142	1%	1,286	13%
City of Seattle		563,374	258,499	105,542	41%	113,400	44%	50,083	19%	16,366	6%	45,017	17%

Sources: 2000 Census, SF 1, P1, P18, P19, and P20.

Notes:

1. Pop. = Population.
2. HH = Household.
3. 1-per HH = One person households.
4. Family HH = Households with more than one person related by blood or marriage or adoption.
5. Percentages may not sum to 100 percent due to rounding.

ATTACHMENT B-10

Household Income Characteristics of the Project Study Area, 1990

Census 1990 Tract	Block Group	Pop.	HH	1989 Median HH Income	1989 Per Capita Income	HH Public Assistance Status is Estimated	1989 HH with Public Assistance	Pop. Poverty Status is Estimated	1989 Pop. Below Poverty
67.98	2	564	373	\$ 37,880	\$ 26,612	375	-	603	49
	<i>Subtotal</i>	564	373	\$ 37,880	\$ 26,612	375	-	603	49
							0%		8.1%
71	1	82	34	\$ 21,071	\$ 8,871	20	-	57	24
	2	697	528	\$ 16,230	\$ 14,534	524	35	691	119
	<i>Subtotal</i>	779	562	\$ 16,523	\$ 13,938	544	35	748	143
							6%		19.1%
72	1	39	19	\$ 11,250	\$ 12,000	30	-	30	-
	2	225	187	\$ 12,634	\$ 12,681	181	-	228	49
	4	120	94	\$ 17,946	\$ 15,103	91	-	119	14
	<i>Subtotal</i>	384	300	\$ 14,211	\$ 13,369	302	-	377	63
							0%		17%
72	3	1,326	1,115	\$ 16,355	\$ 20,423	1,179	98	1,327	187
	<i>Subtotal</i>	1,326	1,115	\$ 16,355	\$ 20,423	1,179	98	1,327	187
							8%		14%
80	1	1,089	810	\$ 23,000	\$ 34,722	758	44	1,044	179
	<i>Subtotal</i>	1,089	810	\$ 23,000	\$ 34,722	758	44	1,044	179
							6%		17%
80	2	1,610	1,220	\$ 11,366	\$ 37,170	1,216	235	1,559	477
	<i>Subtotal</i>	1,610	1,220	\$ 11,366	\$ 37,170	1,216	235	1,559	477
							19%		31%
80	3	340	261	\$ 13,333	\$ 15,839	270	-	309	38
80.99	3	10	-	\$ -	\$ 38,600	-	-	33	-
	<i>Subtotal</i>	350	261	\$ 13,333	\$ 16,489	270	-	342	38
							0%		11.1%
81	3	93	36	\$ 43,558	\$ 43,665	41	-	67	2
	4	935	675	\$ 11,066	\$ 26,022	743	137	986	320
	<i>Subtotal</i>	1,028	711	\$ 12,711	\$ 27,618	784	137	1,053	322
							17%		31%
81	1	45	24	\$ 77,500	\$ 51,222	16	3	31	3
	2	771	244	\$ 4,999	\$ 7,707	233	127	637	418
	<i>Subtotal</i>	816	268	\$ 11,492	\$ 10,107	249	130	668	421
							52%		63%
92	2	441	252	\$ 5,733	\$ 7,142	251	113	440	283
	3	495	129	\$ 27,500	\$ 18,187	130	-	500	201
	<i>Subtotal</i>	936	381	\$ 13,103	\$ 12,983	381	113	940	484
							30%		51%
93	8	361	23	\$ 4,999	\$ 31,782	29	-	342	211
93.99	8	282	-	\$ -	\$ 12,513	-	-	-	-
	<i>Subtotal</i>	643	23	\$ 4,999	\$ 23,331	29	-	342	211
							0%		62%
Project Study Area		9,525	6,024	\$ 16,453	\$ 19,926	6,087	792	9,003	2,574
							13%		29%
City of Seattle		516,259	236,702	\$ 29,353	\$ 18,308	236,908	15,051	498,333	61,681
							6%		12%

Sources: 1990 Census, STF 3, P080A, P095, P114A, P117.

Notes:

1. Pop. = Population.
2. HH = Household.
3. HH Public Assistance Status is Estimated = Total number of households receiving public assistance for which data was predicted based on the sample survey.
4. Census Tract 80.99 Block Group 3 includes those residents that live on boats in Census Tract 80 Block Group 3 in 1990.
5. Census Tract 93.99 Block Group 8 includes those residents that live on boats in Census Tract 93 Block Group 8 in 1990.

ATTACHMENT B-11

Household Income Characteristics of the Project Study Area, 2000

Census 2000 Tract	Block Group	Pop.	HH	1999 Median HH Income	1999 Per Capita Income	HH Public Assistance Status is Estimated	1999 HH with Public Assistance	Pop. Poverty Status is Estimated	1999 Pop. Below Poverty
67	2	609	408	\$ 110,680	\$ 60,919	297	-	667	8
	<i>Subtotal</i>	609	408	\$ 110,680	\$ 60,919	297	-	667	8
							0%		1%
71	2	919	672	\$ 32,995	\$ 32,651	689	9	915	77
	<i>Subtotal</i>	919	672	\$ 32,995	\$ 32,651	689	9	915	77
							1%		8%
72	1	495	331	\$ 28,400	\$ 27,505	328	-	430	64
	<i>Subtotal</i>	495	331	\$ 28,400	\$ 27,505	328	-	430	64
							0%		15%
72	2	2,589	1,819	\$ 27,010	\$ 26,507	1,734	54	2,197	404
	<i>Subtotal</i>	2,589	1,819	\$ 27,010	\$ 26,507	1,734	54	2,197	404
							3%		18%
80.01	1	767	529	\$ 49,537	\$ 75,962	478	10	738	56
	2	1,498	1,073	\$ 30,331	\$ 45,046	1,181	26	1,616	406
	<i>Subtotal</i>	2,265	1,602	\$ 36,673	\$ 55,515	1,659	36	2,354	462
							2%		20%
80.02	1	1,618	1,066	\$ 21,250	\$ 69,681	1,004	32	1,531	427
	2	1,144	841	\$ 35,987	\$ 50,940	859	44	1,139	177
	<i>Subtotal</i>	2,762	1,907	\$ 27,749	\$ 61,919	1,863	76	2,670	604
							4%		23%
80.01	3	1,145	757	\$ 38,316	\$ 38,091	752	33	1,123	255
	<i>Subtotal</i>	1,145	757	\$ 38,316	\$ 38,091	752	33	1,123	255
							4%		23%
81	1	2,431	1,444	\$ 47,083	\$ 51,384	1,404	53	2,395	592
	<i>Subtotal</i>	2,431	1,444	\$ 47,083	\$ 51,384	1,404	53	2,395	592
							4%		25%
81	2	1,046	518	\$ 7,382	\$ 14,286	552	93	874	548
	<i>Subtotal</i>	1,046	518	\$ 7,382	\$ 14,286	552	93	874	548
							17%		63%
92	2	911	431	\$ 16,715	\$ 17,975	441	64	963	462
	<i>Subtotal</i>	911	431	\$ 16,715	\$ 17,975	441	64	963	462
							15%		48%
93	2	667	139	\$ 73,125	\$ 20,508	120	-	623	305
	<i>Subtotal</i>	667	139	\$ 73,125	\$ 20,508	120	-	623	305
							0%		49%
Project Study Area		15,839	10,028	\$ 35,472	\$ 41,646	9,839	418	15,211	3,781
							4%		25%
City of Seattle		563,374	258,499	\$ 45,736	\$ 30,306	258,635	7,638	543,198	64,068
							3%		12%

Sources: 2000 Census, SF 1, P1, P15, AND SF 3, P53, P64, P82, and P87.

Notes:

1. Pop. = Population.
2. HH = Household.
3. HH Public Assistance Status is Estimated = Total number of households receiving public assistance for which data was predicted based on the sample survey.

ATTACHMENT B-12

Population Mobility Disability Characteristics of the Project Study Area, 2000

2000 Census Tract	Block Group	Total Population	16-64 yrs. Disabled	65 yrs. and Older Disabled	Total Persons 16 yrs. or Older Disabled	Percent Population Disabled
67	2	609	-	10	10	
	<i>Subtotal</i>	609	-	10	10	2%
71	2	919	24	-	24	
	<i>Subtotal</i>	919	24	-	24	3%
72	1	495	26	-	26	
	<i>Subtotal</i>	495	26	-	26	5%
72	2	2,589	130	123	253	
	<i>Subtotal</i>	2,589	130	123	253	10%
80.01	1	767	76	8	84	
	2	1,498	75	-	75	
	<i>Subtotal</i>	2,265	151	8	159	7%
80.02	1	1,618	153	29	182	
	2	1,144	83	31	114	
	<i>Subtotal</i>	2,762	236	60	296	11%
80.01	3	1,145	41	16	57	
	<i>Subtotal</i>	1,145	41	16	57	5%
81	1	2,431	104	94	198	
	<i>Subtotal</i>	2,431	104	94	198	8%
81	2	1,046	115	-	115	
	<i>Subtotal</i>	1,046	115	-	115	11%
92	2	911	143	11	154	
	<i>Subtotal</i>	911	143	11	154	17%
93	2	667	71	-	71	
	<i>Subtotal</i>	667	71	-	71	11%
Project Study Area		15,839	1,041	322	1,363	9%
City of Seattle		563,374	19,034	13,017	32,051	6%

Source: 2000 Census, SF 1, P12 & SF 3, P41.

Notes:

1. The 2000 census asked respondents if they had any of the following long-term conditions: a) blindness, deafness, or a severe vision or hearing impairment (sensory disability) or b) a condition that substantially limits one or more basic physical activities, such as walking, climbing stairs, reaching, lifting, or carrying (physical disability).
2. The 2000 census also asked respondents if they had a physical, mental, or emotional conditions that made it difficult to perform certain activities including: a) learning, remembering, or concentrating (mental disability); b) dressing, bathing, or getting around inside the home (self-care disability); c) going outside the home alone to shop or visit a doctor's office (going outside the home disability); and d) working at a job or business (employment disability).
3. Disabilities that affect an individual's ability to "go outside the home alone" is considered a transportation disability.
4. The 1990 census data is not directly comparable. The closest data variable is STF 3, P067, which addresses mobility limitation status for individuals 15 years and older.

ATTACHMENT B-13

Household Transit Dependency Characteristics of the Project Study Area, 2000

2000 Census Tract	Block Group	Households	Total Dwellings	Dwellings Occupied	No Vehicle Available to Occupants of Dwelling	%
67	2	408	432	408	34	
	<i>Subtotal</i>	408	432	408	34	8%
71	2	672	876	672	208	
	<i>Subtotal</i>	672	876	672	208	31%
72	1	331	360	331	153	
	<i>Subtotal</i>	331	360	331	153	46%
72	2	1,819	2,174	1,819	1,165	
	<i>Subtotal</i>	1,819	2,174	1,819	1,165	64%
80.01	1	529	602	529	98	
	2	1,073	1,179	1,073	536	
	<i>Subtotal</i>	1,602	1,781	1,602	634	40%
80.02	1	1,066	1,155	1,066	717	
	2	841	1,004	841	332	
	<i>Subtotal</i>	1,907	2,159	1,907	1,049	55%
80.01	3	757	827	757	268	
	<i>Subtotal</i>	757	827	757	268	35%
81	1	1,444	1,798	1,444	631	
	<i>Subtotal</i>	1,444	1,798	1,444	631	44%
81	2	518	547	518	466	
	<i>Subtotal</i>	518	547	518	466	90%
92	2	431	446	431	309	
	<i>Subtotal</i>	431	446	431	309	72%
93	2	139	142	139	8	
	<i>Subtotal</i>	139	142	139	8	6%
Project Study Area		10,028	11,542	10,028	4,925	49%
City of Seattle		258,499	270,524	258,499	42,180	16%

Source: 2000 Census, SF 1, P15, H1, H3, and SF 3, H44.

Note:

1. Transit dependency is defined as occupied housing units with no vehicle available for personal use, though a vehicle may be available for business or work use.

ATTACHMENT B-14

Housing Characteristics of the Project Study Area, 1990

1990 Census Tract	Block Group	Households	Total Dwellings	Vacant Dwellings	Vacant, for rent	Vacant, for sale	Occupied Dwellings	Own	Rent	Persons in Group Non-Institutional Housing
67.98	2	373	394	21	10	1	373	67	306	-
	<i>Subtotal</i>	373	394	21	10	1	373	67	306	-
				5%				18%	82%	
71	1	34	36	2	2	-	34	-	34	33
	2	528	579	51	25	-	528	41	487	1
	<i>Subtotal</i>	562	615	53	27	-	562	41	521	34
				9%				7%	93%	
72	1	19	20	1	-	-	19	-	19	9
	2	187	227	40	24	-	187	10	177	-
	4	94	100	6	6	-	94	1	93	-
	<i>Subtotal</i>	300	347	47	30	-	300	11	289	9
				14%				4%	96%	
72	3	1,115	1,276	161	138	1	1,115	93	1,022	-
	<i>Subtotal</i>	1,115	1,276	161	138	1	1,115	93	1,022	-
				13%				8%	92%	
80	1	810	911	101	88	2	810	182	628	-
	<i>Subtotal</i>	810	911	101	88	2	810	182	628	-
				11%				22%	78%	
80	2	1,220	1,379	159	118	9	1,220	227	993	109
	<i>Subtotal</i>	1,220	1,379	159	118	9	1,220	227	993	109
				12%				19%	81%	
80	3	261	274	13	9	-	261	-	261	20
80.99	3	-	-	-	-	-	-	-	-	10
	<i>Subtotal</i>	261	274	13	9	-	261	-	261	30
				5%				0%	100%	
81	3	36	76	40	36	-	36	28	8	38
	4	675	729	54	23	-	675	133	542	84
	<i>Subtotal</i>	711	805	94	59	-	711	161	550	122
				12%				23%	77%	
81	1	24	29	5	5	-	24	15	9	7
	2	244	262	18	18	-	244	-	244	449
	<i>Subtotal</i>	268	291	23	23	-	268	15	253	456
				8%				6%	94%	
92	2	252	253	1	1	-	252	1	251	160
	3	129	141	12	3	-	129	14	115	310
	<i>Subtotal</i>	381	394	13	4	-	381	15	366	470
				3%				4%	96%	
93	8	23	23	-	-	-	23	-	23	317
93.99	8	-	-	-	-	-	-	-	-	282
	<i>Subtotal</i>	23	23	-	-	-	23	-	23	599
				0%				0%	100%	
Project Study Area		6,024	6,709	685	506	13	6,024	812	5,212	1,829
				10%	74%	2%	90%	13%	87%	
City of Seattle		236,702	249,032	12,330	5,943	1,675	236,702	115,709	120,993	5,384
				5%	48%	14%	95%	49%	51%	

Source: 1990 Census, STF 1, P003, P028, H001, H002, H003, H030.

Notes:

- Categories of vacant housing includes: vacant for rent, vacant for sale, and other.
- Group Non-Institutional = Group quarters including: college dormitories, military quarters, emergency shelters, visible in street, and others. It does not include group quarters such as correctional institutions, nursing homes, psychiatric hospitals, and juvenile institutions.
- Census Tract 80.99 Block Group 3 includes those residents who live on boats in Census Tract 80 Block Group 3 in 1990.
- Census Tract 93.99 Block Group 8 includes those residents who live on boats in Census Tract 93 Block Group 8 in 1990.
- Sums may not total 100 percent due to rounding.

ATTACHMENT B-15

Housing Characteristics of the Project Study Area, 2000

2000 Census Tract	Block Group	Households	Total Dwellings	Vacant Dwellings	Vacant, for rent	Vacant, for sale	Occupied Dwellings	Own	Rent	Persons in Other Non-Institutional Group
67	2	408	432	24	9	1	408	154	254	1
	<i>Subtotal</i>	408	432	24	9	1	408	154	254	1
				6%				38%	62%	
71	2	672	876	204	18	59	672	103	569	49
	<i>Subtotal</i>	672	876	204	18	59	672	103	569	49
				23%				15%	85%	
72	1	331	360	29	16	-	331	1	330	92
	<i>Subtotal</i>	331	360	29	16	-	331	1	330	92
				8%				0%	100%	
72	2	1,819	2,174	355	243	2	1,819	206	1,613	-
	<i>Subtotal</i>	1,819	2,174	355	243	2	1,819	206	1,613	-
				16%				11%	89%	
80.01	1	529	602	73	11	6	529	268	261	-
	2	1,073	1,179	106	40	2	1,073	346	727	139
	<i>Subtotal</i>	1,602	1,781	179	51	8	1,602	614	988	139
				10%				38%	62%	
80.02	1	1,066	1,155	89	52	1	1,066	191	875	186
	2	841	1,004	163	48	10	841	99	742	-
	<i>Subtotal</i>	1,907	2,159	252	100	11	1,907	290	1,617	186
				12%				15%	85%	
80.01	3	757	827	70	24	4	757	232	525	171
	<i>Subtotal</i>	757	827	70	24	4	757	232	525	171
				8%				31%	69%	
81	1	1,444	1,798	354	99	4	1,444	423	1,021	470
	<i>Subtotal</i>	1,444	1,798	354	99	4	1,444	423	1,021	470
				20%				29%	71%	
81	2	518	547	29	26	-	518	18	500	383
	<i>Subtotal</i>	518	547	29	26	-	518	18	500	383
				5%				3%	97%	
92	2	431	446	15	6	-	431	44	387	346
	<i>Subtotal</i>	431	446	15	6	-	431	44	387	346
				3%				10%	90%	
93	2	139	142	3	1	1	139	94	45	445
	<i>Subtotal</i>	139	142	3	1	1	139	94	45	445
				2%				68%	32%	
Project Study Area		10,028	11,542	1,514	593	90	10,028	2,179	7,849	2,282
				13%	39%	6%	87%	22%	78%	
City of Seattle		258,499	270,524	12,025	4,870	1,473	258,499	125,165	133,334	8,921
				4%	40%	12%	96%	48%	52%	

Source: 2000 Census, SF 1, P15, P37, H1, H3, H4, H5.

Notes:

- Categories of vacant housing include: a) vacant for rent; b) vacant for sale; c) rented or sold, but not occupied; d) for seasonal, recreational, or occasional use; e) for migrant workers; and f) others.
- Group Non-Institutional includes college dorms, military quarters, and other non-institutional group quarters (including emergency housing & shelters). It does not include correctional institutions, nursing homes, or other institutions.
- Sums may not total 100 percent due to rounding.

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ATTACHMENT C

List of Preparers

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LIST OF PREPARERS

Name/Title Participation	Education	Professional Discipline	Experience
Betsy Minden, Senior Planner Social Resources Technical Memorandum, Author	Bachelor of Arts (Biology), Master of Urban Planning	Urban Planner	24 years

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