SR 99
Aurora Avenue North Multimodal Corridor Project: North 145th Street to North 165th Street

Environmental Assessment

and

Draft Environmental Impact Statement

July 2002

U.S. Department of Transportation
Federal Highway Administration

Washington State Department of Transportation

CITY OF SHORELINE

SR 99
Aurora Avenue North Multimodal Corridor Project: North 145th Street to North 165th Street

City of Shoreline, King County, Washington

NEPA Environmental Assessment and SEPA Draft Environmental Impact Statement

Submitted Pursuant to the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and 23 CFR 771 and the State Environmental Policy Act (Chapter 43.21 C RCW) and Chapter 197-11 WAC

by the

U.S. Department of Transportation, Federal Highway Administration

and

Washington State Department of Transportation

and

City of Shoreline

6/26/02
DATE OF APPROVAL — CITY OFFICIAL

7/1/02
DATE OF APPROVAL — WSDOT OFFICIAL

7/3/02
DATE OF APPROVAL — FHWA OFFICIAL

The project would improve Aurora Avenue North from approximately North 145th Street to North 165th Street by constructing business access/transit lanes, curbs, gutters and sidewalks, stormwater facilities, raised medians with U-turn and left-turn pockets, consolidated driveway access points, traffic signals, pedestrian safety facilities, landscaping, and other urban aesthetic amenities including undergrounding of overhead utility distribution lines.

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Fact Sheet

Title

SR 99, Aurora Avenue North Multimodal Corridor Project, North 145th Street to North 165th Street

Description of Proposal and Alternatives

The project would improve approximately 1 mile of Aurora Avenue North by constructing business access/transit (BAT) lanes, curbs, gutters, and sidewalks, stormwater facilities, and medians with left- and U-turn pockets.

Alternative A proposes construction of 8-foot-wide sidewalks (with an adjacent 4-foot-wide amenity zone and 6-inch curb) that extend between the intersections in the project area, and seven lanes of traffic (two general-purpose lanes and one continuous BAT lane northbound and southbound, and one center lane for left/U-turn pockets/median). The raised center median would be mostly continuous between signalized intersections at North 145th Street, North 152nd Street, North 160th Street, and North 165th Street., There would be three additional openings—one for left and U-turns at North 149th Street, one for left and U-turns at the Seattle Restaurant Store (at 14910 Aurora), and one for left and U-turns at North 163rd Street. In addition, dual left-turn lanes would be provided northbound at North 160th Street and eastbound at North 155th Street. A right-turn lane would also be constructed southbound at North 155th Street.

Alternative B proposes construction of 7-foot-wide sidewalks (adjacent to a 6-inch curb) that extend between intersections in the project area and seven lanes of traffic (two general-purpose lanes and one continuous BAT lane northbound and southbound, and one center lane for left/U-turn pockets/median). Additional openings in the raised median would be provided in left-turn pockets for left turns and/or U-turns at the following locations: southbound at Shurgard Storage Center, northbound at the Quest Inn Motel, southbound at Seattle Restaurant Supply, southbound at Shoreline Family Auto Care, and northbound at the Arden Rehabilitation Center (see Figure 2-4). In addition, dual left/U-turn lanes would be provided northbound at North 160th Street and eastbound at North 155th Street. A right-turn lane would also be constructed southbound at North 155th Street.

Location of Site	The proposed project limits of the Aurora Corridor Project are generally from North 145th Street to North 165th Street in the City of Shoreline. The outer limits of the project are approximately 50 feet beyond the Aurora Avenue North right-of-way lines, except at intersections that approach roadways (including North 145th Street to the south and North 165th Street to the north) where the project limits extend to various distances from the street centerline of Aurora Avenue North to accommodate sight distance and channelization improvements.
Proponent	The City of Shoreline is the project proponent. The Federal Highway Administration is serving as the NEPA lead agency.
Date of Implementation	Project is anticipated to open in 2004.
Nominal Lead Agency	City of Shoreline for SEPA; FHWA for NEPA
Responsible Officials	Timothy M. Stewart, AICP SEPA Responsible Official City of Shoreline 17544 Midvale Avenue N Shoreline, WA 98133
Contact Persons	Joyce Nichols Community and Government Relations Manager City of Shoreline 17544 Midvale Avenue N Shoreline, WA 98133 (206) 546-0779 Elizabeth Healy, Transportation and Environmental Engineer FHWA, Washington Division 711 S Capitol Way, Suite 501 Olympia, WA 98501 (360) 753-8655
Potential Permits and Licenses	City of Shoreline Right-of-Way permit; NEPA approval; National Pollutant Discharge Elimination System Baseline General Permit for Construction Sites; Stormwater Site Plan and Temporary Sediment and Erosion Control Plan; SEPA approval; ESA approval; Section 106 approval.

Authors and Principal Contributors to the EA/Draft EIS	CH2M HILL 777 108th Avenue NE PO Box 91500 Bellevue, WA 98009 Entech Northwest, Inc. PO Box 25318 Federal Way, WA 98093 Arai/Jackson 1601 East John Street Seattle, WA 98112 See Appendix C for a complete list of personnel by name and area of contribution.
Date of Issue of EA/Draft EIS	July 10, 2002
Date Comments are Due on EA/Draft EIS	August 16, 2002, 5:00 p.m.
Date and Location of Hearing on EA/Draft EIS	August 6, 2002, 5:30-7:00 p.m. — Open House 7:00-10:00 p.m. — Hearing Shoreline Conference Center Shoreline Room 18560 First Avenue NE Shoreline, WA
Date Final Action is Planned	Construction is currently anticipated to begin in 2003 and last approximately 18 months.
Location of Background Information	Background material and support documents used in the preparation of this document are available for review at the FHWA Washington Division office in Olympia, Washington, the WSDOT Northwest Region office in Shoreline, Washington, and at the City of Shoreline's City Clerk's office.
Cost to public of a copy of the DEIS	$20.00

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Description of Proposed Action

The project would improve Aurora Avenue North from North 145th Street to North 165th Street by constructing business access/transit lanes, curbs, gutters and sidewalks, stormwater facilities, medians with U-turn and left-turn pockets, consolidated driveway access points, traffic signals, pedestrian safety facilities, landscaping, and other urban aesthetic amenities including undergrounding of utilities.

Summary Description of Alternatives Considered

Alternative A of the Aurora Avenue North Multimodal Corridor Project: North 145th Street to North 165th Street (Aurora Corridor Project) would include construction of 8-foot-wide sidewalks, plus an adjacent 4-foot-wide amenity zone and 6-inch curb that would extend the length of the project area, and seven traffic lanes (two general-purpose lanes and one continuous Business Access/Transit [BAT] lane northbound and southbound, and one center lane for left/U-turn pockets/median). The raised center median would be continuous between signalized intersections, except for three openings—one for left and U-turns at North 149th Street, one for left U-turns at the Seattle Restaurant Store (at 14910 Aurora), and one for left U-turns northbound at North 163rd Street. In addition, dual left-turn lanes would be provided northbound at North 160th Street and eastbound at North 155th Street. A right-turn lane would also be constructed southbound at North 155th Street. Additional proposed improvements include constructing curbs and gutters on all sidewalks, planting street trees, and providing other pedestrian amenities. Overhead distribution utility lines (low-voltage electrical, cable television, and telephone) would be relocated underground. Stormwater facilities would also be constructed.

Alternative B would include construction of 7-foot-wide sidewalks (adjacent to a 6-inch curb) that extend the length of the project area and the same lane configuration as Alternative A. Additional openings in the raised median would be provided in left-turn pockets for left turns and/or U-turns at the following locations: southbound at Shurgard Storage Center, northbound at the Quest Inn Motel, southbound at Seattle Restaurant Supply, southbound at Shoreline Family Auto Care, and northbound at the Arden Rehabilitation Center (see Figure 2-4). In addition, dual left/U-turn lanes would be provided northbound at North 160th Street and eastbound at North 155th Street. A right-turn lane would also be constructed southbound at North 155th Street. Curbs and gutters would be included on all sidewalks and overhead distribution utility lines (low-voltage electrical, cable television, and telephone) would be relocated underground. Alternative B would not include street trees. Stormwater facilities would also be constructed.

This document also analyzes a No Action alternative. This alternative assumes that there would be no additional improvements to the Aurora corridor except for general street maintenance. Other capital improvement projects presented in the *City of Shoreline*

Comprehensive Plan (City of Shoreline, 1998) would be implemented according to schedule but are not analyzed in this environmental document.

Description of Other Major Actions

There are three other projects that relate to the Aurora Corridor Project in terms of their proximity to the project and their effects on the movement of people and vehicles—the Interurban Trail, improvements from North 165th Street to North 205th Street, and the Pedestrian Safety Demonstration Project. Each of these projects has independent utility and logical termini. The Interurban Trail project will enhance the regional transportation system by providing a new non-motorized link through the City of Shoreline. The Interurban Trail will be built along the old Interurban Railroad right-of-way, which is now owned by Seattle City Light and used as a transmission line right-of-way. The Interurban Trail will be environmentally documented in a separate NEPA document and then constructed in phases. The first phase will be from North 145th Street to North 165th Street. Evaluation and further design analyses for improvements to Aurora Avenue North from North 165th Street to North 205th Street are contingent upon project funding and further environmental review. The design of that project may be based on the Citizen Advisory Task Force committee's recommended Alternative 2 from the Pre-Design Study that covered the full length of the Aurora corridor within the City of Shoreline and on the project's environmental determination. Additional environmental review and public involvement will take place and design refinements and modifications may be made to suit the conditions in that portion of the corridor to help minimize and avoid environmental impacts. The location and design of the Interurban Trail from North 175th Street to North 185th Street also might be evaluated at a project level with the environmental document for Aurora Avenue North from North 165th Street to North 205th Street. Two Pedestrian Safety Demonstration projects will be built along Aurora Avenue at North 165th Street and North 170th Street. Improvements at these locations will include pedestrian refuge areas, pedestrian-activated flashing advance warning signals and "roving eyes" signals, sidewalk improvements and lighting. Each of these projects has or will undergo its own environmental documentation process.

Impacts Identified in This Document

The following summarizes both the major and the minor environmental impacts identified in this document. Many of the impacts resulting from the project are positive rather than negative in nature.

Transportation

Impacts to traffic during construction would be the only transportation impact under the build alternatives. The impacts would be marginally worse under Alternative A than Alternative B. The potential construction impacts could be mitigated to a great extent using construction staging and traffic control practices that would be offered as a part of the project. Under either alternative, traffic operations would be substantially better with implementation of the project. In addition, transit speed and reliability and, therefore, mode share would also be substantially better under Alternatives A and B than under the No

Action Alternative. The build alternatives would result in less traffic diverting to neighborhoods than would be expected under the No Action Alternative. In terms of safety, Alternative A would be expected to provide the most benefit, with Alternative B providing slightly less and the No Action Alternative much less.

Land Use

Alternatives A and B of the proposed Aurora Corridor Project would require acquisition of minor amounts of property consisting of a narrow strip along Aurora Avenue North and would largely be beneficial to the existing commercial land uses by providing greater vehicular, transit, and pedestrian access to existing commercial land uses and enabling commercial redevelopment along the corridor. Alternative A would have slightly greater direct land use impacts because it would require a wider right-of-way than Alternative B, but it would also be slightly more beneficial by enabling a more attractive commercial frontage. Both build alternatives would support many of the City's policies to enhance Aurora Avenue North as an attractive and thriving business and retail area. The No Action Alternative would not support and enhance commercial land uses along the corridor as envisioned by many of the City's policies. Redevelopment would likely still occur, but at a slower rate.

Social

Neither proposed build alternative nor the No Action Alternative for the Aurora Corridor Project would have substantial social impacts on recreational facilities, regional and community growth, public services, and pedestrian and bicyclist facilities. Because no substantial impacts have been identified for any environmental element, no high and adverse human health or environmental effects of the proposed project are expected to fall disproportionately on minority or low-income populations.

Recreation

There are three parks (Darnell Park, Meridian Park, and Richmond Highlands Park) and a proposed regional bicycle and pedestrian trail (Interurban Trail) near the Aurora Corridor Project area. Although the capacity of these parks would be unaffected by either build alternative, access to them would be improved. Pedestrian design elements incorporated into both build alternatives would improve the safety of pedestrian travel along the corridor and near the Interurban Trail and Darnell Park. Other parks and recreational space at nearby schools would be unaffected. The No Action Alternative would have no impacts.

Regional and Community Growth

For the past 20 years, the population in what is now the City of Shoreline's has grown steadily to 53,025 in 2000. The City's good schools and proximity to job centers in King and Snohomish Counties continue to be strong reasons for newcomers to move into the area. Neither project alternative is expected to strongly affect growth trends and patterns in the City. These alternatives would be a functional part of a stronger commercial core, as determined by the *City of Shoreline Comprehensive Plan*. The No Action Alternative would have no impact on regional and community growth.

Services

A wide array of public services and utilities are available in the project area. In general, improved transportation flow through the Aurora corridor would improve access to these services. The raised median that would be constructed under either alternative would have limited effects on emergency response times and no impact on police response times. Existing utilities would be undergrounded. Congestion under the No Action Alternative could hinder the provision of public services.

Pedestrian and Bicyclist Facilities

Poor facilities, high traffic volumes, and high traffic speeds contribute to poor non-motorized conditions along the Aurora corridor. Bicyclists and pedestrians traveling on Aurora Avenue North generally use the shoulder area and intermittent sidewalks for travel. The build alternatives would provide sidewalks with varying degrees of pedestrian amenities and safety features. Additional signalized intersections would provide more opportunities for pedestrians to safely cross Aurora Avenue North. Neither build alternative would include bicycle lanes, however bicyclists could use the business access/transit (BAT) lanes. Bicycle travel along the corridor would be handled primarily by the future construction of the Interurban Trail.

Environmental Justice

To make a finding that a proposed project is inconsistent with the Environmental Justice policy (Executive Order 12898), two situations must occur at the same time: (1) there must be a minority or low-income population and (2) that population must receive a disproportionately high and adverse environmental or human health impact. Because no substantial adverse impacts are expected as a result of either build alternative or the No Action Alternative, none of the impacts of the proposed project would be described as having a high and adverse impact in the context of EO 12898, U.S. Department of Transportation Order 5610.2, or Federal Highway Administration (FHWA) Order 6640.23.

Economics

Local and regional economic impacts associated with the Aurora Corridor Project would include minor impacts to access and mobility, retail sales, property tax collections, and employment. During construction, retail sales could decline due to temporary access restrictions and increased congestion, but this could be offset partially by construction worker spending. These impacts would be short-term and not substantial. Right-of-way acquisition for Alternatives A and B would result in the loss of parking spaces; however, replacement is possible, and impacts to affected businesses would not be substantial. Under Alternatives A and B, new right-of-way acquisition would also remove a small amount of taxable property from the City's taxable base; the property tax impact would not be substantial. The City could receive a substantial one-time increase in sales and use tax resulting from the purchase of labor and materials for project construction. Under Alternatives A and B, the local and regional economies would benefit from the operation of the project as mobility and safety are improved along Aurora Avenue North. Businesses that rely on the movement of goods and services along the corridor would experience reduced travel times and reduced transportation costs, as compared with the No Action Alternative. Retail sales might increase at some local businesses because of the improved

overall access, mobility, and safety. Under the No Action alternative, there would be no decrease in property tax revenues due to City acquisition of new right-of-way. The No Action Alternative would likely have increased congestion, which could impact business access.

Air Quality

The results of the analysis indicate that no new air quality violations are anticipated as a result of the proposed project. The results of the air quality analysis indicate that the carbon monoxide (CO) concentrations for Alternatives A and B would be the same as the No Action Alternative in the vicinity of North 145th Street and slightly higher than the No Action Alternative in the vicinity of North 155th Street. Although predicted 8-hour concentrations are higher than the National Ambient Air Quality Standards (NAAQS) at North 145th Street, neither build alternative would create a new CO violation of the NAAQS, nor worsen an existing violation.

Noise

Results from the noise monitoring and modeling of the current conditions demonstrate that noise levels at two receptors (at the Shoreline Inn and Quest Inn) equal or exceed the FHWA Noise Abatement Criteria of 67 dBA. The proposed project would not increase noise levels compared to the No Action alternative. Therefore, no substantial impacts have been identified and none are anticipated for either Alternatives A or B.

Surface Water/Water Quality

The impact to surface waters (quality and quantity) would be minimal from the Aurora Corridor Project because stormwater treatment and detention facilities would be integrated into the project design throughout the corridor, as required by local and federal regulations. Project-related impacts under the build alternatives would be limited to potential degraded water quality contributions to local streams and potential for increased flow rates and volumes that could also degrade water quality and aquatic habitat. The temporary risk of an increase in sedimentation and of hazardous substance spillage during and following construction would be addressed by implementation of best management practices (BMPs). Stormwater within the project area is presently untreated. Water quality would be improved under both build alternatives because they would require stormwater treatment. Hydraulic impacts to surface waters would be improved under Alternative A due to decreased impervious area (more potential for infiltration of precipitation) and the incorporation of stormwater detention facilities, and most likely negligible under Alternative B due to implementation of stormwater detention facilities. Under the No Action Alternative, current impacts to the aquatic environment would continue, with water quality impacts remaining the predominant concern.

Wildlife, Fisheries, and Vegetation

Impacts to terrestrial resources are not anticipated due to the lack of vegetation in the project area and the absence of the wildlife species that such vegetation would support. Project-related impacts under the build alternatives would be limited to potential aquatic habitat alteration and degraded water quality contributions to local streams. As discussed above for water quality, the temporary risk of increased sedimentation and the release of a

hazardous substance during and following construction would be addressed by implementation of BMPs. Furthermore, water quality would be improved under both build alternatives because presently untreated stormwater would receive treatment. In addition, hydraulic impacts to surface waters would be negligible due to implementation of stormwater treatment facilities.

Historical and Archaeological Resources

The Aurora Corridor Project would not affect any cultural resources eligible for inclusion in the National Register of Historic Places (NRHP). The Hide-a-Way Tavern (at 14525 Aurora Avenue North) and the Pershing Interurban Bulkhead (Aurora Avenue North at 155th Street) are of local historical importance, but were determined to be ineligible for inclusion on either the NRHP or on the Washington Register of Historical Places (WRHP). Neither historic property would be directly affected by the project, although the Hide-a-Way Tavern might be subject to some indirect ("proximity") effects, such as noise, vibration, or visual intrusion, because traffic would be closer to the building than it currently is. There would be no impacts from the No Action Alternative. The SHPO has concurred with these findings.

Visual Quality

Alternatives A and B would have a beneficial impact on the visual quality of the project area. Both build alternatives would increase the level of the three basic elements comprising visual quality: vividness, intactness, and unity, and viewer response to those changes would likely be positive. The landscape and streetscape improvements proposed under the build alternatives would increase the area's vividness and unity. Intactness would improve when utility lines were placed underground, removing an encroaching visual element. Alternative B would have a slightly less beneficial impact than Alternative A because the improvements proposed under Alternative B would not provide the same level of unity as Alternative A. The No Action Alternative would perpetuate the negative visual characteristics prevalent within the project area: a discontinuous street edge, numerous street signs and utility lines, and a lack of interesting visual elements, such as street trees or attractive street and sidewalk amenities.

Hazardous Waste

The results of this analysis indicate that there are potential project impacts during construction of Alternatives A or B if areas of existing contamination are disturbed and contaminants are released to the environment. These potential impacts are expected to be avoided through standard construction planning practices such as identification of buried fuel systems at current or former fueling stations and identification of hazardous materials prior to removal of transformers or demolition of structures. If hazardous materials or substances are located within the construction project area, adherence to existing regulations will prevent impacts to human health and the environment. Increased traffic flow during long-term operation may result in increased transportation of hazardous substances; therefore, there is the potential for increased risk of incidental spills of these materials. This potential impact is the same for the alternatives.

Introduction

Aurora Avenue North is a major north/south urban highway that serves both local and regional traffic within the City of Shoreline, Washington. Aurora Avenue North, as named within the City of Shoreline, is a portion of signed State Route 99 (SR 99) that extends from north Pierce County to north Snohomish County and serves as a regional link between cities within the Puget Sound Region. The cross section, function, and character of SR 99 varies widely along the roadway. Some portions of SR 99 have a five-lane cross section, some portions have a seven-lane cross section with sidewalks, and some portions are limited-access freeways. In the City of Shoreline, SR 99 is the major traffic artery, with links to I-5 through connections at North 145th Street, North 175th Street, and North 205th Street.

Aurora Avenue North has substantial traffic congestion, unsafe pedestrian facilities and traffic conditions, and unsightly commercial strip development. The City of Shoreline's goals for the project, as stated in its Comprehensive Plan, are to support economic stability along the corridor and provide multimodal transportation services.

The City of Shoreline, in cooperation with the Federal Highway Administration (FHWA), is proposing improvements to the portion of Aurora Avenue North from North 145th Street to North 165th Street. The City of Shoreline currently has two improvements projects for Aurora Avenue North from the southern City limits at North 145th Street to the northern City limits at North 205th Street, but only one is currently funded. However, only a limited amount of project funding is available at this time, and there is no certainty regarding if or when additional funding will become available. The project proposed under this environmental document is the first of these projects, from North 145th Street to North 165th Street. Additional environmental review, public involvement, and design analyses for the portion from North 165th Street to North 205th Street is contingent upon funding.

This single document serves as both a State Environmental Policy Act (SEPA) Environmental Impact Statement (EIS) and a National Environmental Policy Act (NEPA) Environmental Assessment (EA). The SEPA lead agency is the City of Shoreline, while the lead agency for NEPA procedures is FHWA. Each lead agency will conduct its own review of the document in compliance with NEPA and SEPA procedures. Following the publication of the document, a joint (NEPA and SEPA) public hearing will be held to record comments from the public on the content of the document. Written comments will be accepted at any time during the comment period. The Final EIS and FONSI will contain responses to these comments.

CHAPTER 1

Purpose and Need of Proposed Project

Purpose of Project

The purpose of this project is to improve the safety of all users on Aurora Avenue North (SR 9) in the City of Shoreline from North 145th Street to North 165th Street with improved channelization, access management, and pedestrian amenities, and to improve the multimodal mobility with a proposed northbound and southbound Business Access/Transit (BAT) lane.

Need for Project

The Aurora Avenue North Multimodal Corridor Project is intended to improve Aurora Avenue North to improve safety for vehicles and non-motorized users, to accommodate future regional and local demands on the facility, and to support the community goals set forth in the *City of Shoreline Comprehensive Plan* (City of Shoreline, November 1998). Aurora Avenue North (SR 99), is a key regional vehicular, transit, and truck corridor within the Puget Sound region. It also serves as the commercial backbone of the City.

The need for this project is related to issues of safety, social demands, and local and regional transportation. This project addresses vehicular safety and roadway deficiencies (channelization and access management improvements) and also supports the City's economic development plan for the corridor contained in its adopted Comprehensive Plan. The project also addresses key deficiencies in the corridor capacity, transit amenities, and system linkages while addressing transportation demand.

Safety

Vehicular Safety

For a number of years, Aurora Avenue North has been identified by the Washington State Department of Transportation (WSDOT) as a high crash corridor. Crash rates along the corridor are well above statewide averages. For the past 6 years fatalities along Aurora Avenue North have occurred on average more than once per year. There is strong public concern for general traffic safety and pedestrian safety along the corridor. Without improvements, congestion and crash rates along the corridor will continue to increase. In 1999 and 2000, the crash rate for this portion of roadway was calculated to be 8.3 crashes per million vehicle miles (mvm) traveled. This is compared to the statewide average for major arterials of 3 crashes per mvm.

Roadway Deficiencies

Aurora Avenue North currently lacks adequate access management. Freestanding commercial buildings with individual driveways or continuous shoulder access are dominant along the roadway from North 145th Street to North 165th Street, resulting in a

large number of individual access points. In total, there are 63 access points along this 1-mile section (see Table 1-1).

Table 1-1
Existing Driveway Access Along Aurora Avenue North
(North 145th Street to North 165th Street)

		Driveway Count					
		Northbound		Southbound		Totals	
Beginning at	Driveways per Mile	Full Access	Right-In / Right-Out Only	Full Access	Right-In / Right-Out Only	Full Access	Right-In / Right-Out Only
North 145th Street	72	14	2	18	5	32	7
North 155th Street	32	4	2	2	0	6	2
North 160th Street	64	6	3	6	1	12	4
						50	13
Average	**60**				**Total**	**63**	

Source: CH2M HILL, 2001

Much of the existing business parking along the corridor is directly adjacent to the roadway shoulders and is angled or perpendicular to the street. Parking within the Aurora Avenue North roadway right-of-way occurs primarily near retail and commercial land uses within the project area. Several businesses along the roadway from North 145th Street to North 165th Street promote use of the shoulder for parking in areas where there is no curb.

Aurora Avenue North is also deficient for non-motorized travel. Numerous driveways, limited curbs and sidewalks, and erratic parking all contribute to a general lack of safe passage for pedestrians and bicyclists.

Social Demands

Economic Development

Improvements to the highway environment are needed to achieve the vision for the Aurora corridor's commercial environment. Conditions from North 145th Street to North 165th Street include substantial traffic congestion, unsafe pedestrian facilities, and unsightly and aging commercial "strip" development. The City's objective for Aurora Avenue North is to install improvements that would lead people to the community and its businesses.

The *City of Shoreline Comprehensive Plan* forecasts 3,300 additional jobs in the entire corridor (from North 145th Street to North 205th Street) by 2015. This growth depends on a revitalized roadway corridor along all of Aurora Avenue North, including from the area from North 145th Street to North 165th Street. It can be expected that actual job growth will be much less in the corridor if no improvements are made to Aurora Avenue North. Business types (including banks, offices, self storage, service, automobile repair, mini-casinos, porn video,

and appliance stores) will remain instead of the transit supportive land uses, design and density that the City desires to support its Comprehensive Plan and GMA goals. The Comprehensive Plan sets forth a vision that concentrated activity centers will develop at several locations along the corridor. These are located at North 155th Street (The Aurora Square), between North 175th Street and North 185th Street, and between North 200th Street and North 205th Street (Aurora Village). To support the economic development goals of the Comprehensive Plan, improvements are needed for pedestrian and transit access to and between these locations.

Legislation

Resolution 156 was adopted unanimously by the City Council on August 23, 1999, at an open meeting that included opportunities for public testimony. At this meeting, the proposed concept for Aurora Avenue North was reviewed and found to be compatible and consistent with the *City of Shoreline Comprehensive Plan*. The Resolution provides a 32-point directive from the City Council for improvements to Aurora Avenue North designed to meet the needs identified for the corridor.

To preserve the safety and operational characteristics of state highways, Revised Code of Washington (RCW) 47.50 was enacted in 1991, designating all highways in Washington as controlled-access facilities. Aurora Avenue North, part of SR 99, is a Class 4 facility according to the WSDOT Access control classification system and standards. Within this class, access management measures are identified, such as minimum driveway spacing of 250 feet and installation of medians to mitigate turning, weaving, and crossing conflicts that affect safe travel. Based on the urban environment served by Aurora Avenue North and the high traffic volumes it carries, the street's design is deficient in terms of access management for the preservation of safety and traffic operations.

Regional Transportation

Capacity

The current facility is inadequate to accommodate projected traffic volumes. The corridor currently supports 35,000 (North 145th Street) to 40,000 (North 155th Street) daily vehicle trips. During the next 20 years, volumes along the corridor are expected to increase by 1.25 to 1.75 percent annually, which will further exacerbate the problems of congestion, safety, and air quality.

Without improvements, average delay at signalized intersections along Aurora Avenue North will fall to level of service (LOS) F (an average of more than 80 seconds of delay per vehicle) during the afternoon (p.m.) peak period (see Table 1-2). These conditions are considered unacceptable by most drivers and are not consistent with the Comprehensive Plan's LOS standard of E (average of between 55 and 80 seconds delay per vehicle) for the corridor. A lack of adequate capacity along Aurora Avenue North will cause increased traffic volumes along parallel neighborhood routes.

Table 1-2
2020 Estimated p.m. Peak Intersection Level of Service Summary

	No Action Alternative	
Cross Street	**LOS**	**Vehicle Delay (seconds)**
North 145th Street	F	119
North 152nd Street[1]	F	> 100
North 155th Street	F	96
North 160th Street	D	47
North 165th Street[1]	F	> 100
Corridor Average[2]	**F**	**87.3**

Source: CH2M HILL, 2001
[1] Unsignalized intersection—LOS and delay for minor approaches
[2] Unsignalized intersections not included in corridor average calculation.

Capacity improvements are needed in the corridor and should come through intersection geometry, channelization, and signal improvements, as well as additional lane capacity in the corridor for business access and transit. In addition, for minor cross streets, left-turn, right-turn, and through lanes at intersections as well as improvements to signal equipment and timing are needed to allow the arterial system to operate more efficiently. By reducing the number of access points according to WSDOT Access Management criteria, capacity in the corridor can also be improved through the reduction of conflicts and traffic friction.

Modal Interrelationships

The portion of Aurora Avenue North in the City of Shoreline is heavily automobile-oriented, with infrequent pedestrian or bicycle facilities. Driveway access along the corridor is largely undefined and sidewalk facilities are discontinuous and substandard. The only areas where sidewalks meet City standards are areas along developments that have been built within the last 4 years. Bus transit facilities along the corridor are an outgrowth of historic and geographic circumstances. Transit zones (bus stops) lack safe access, especially for persons with disabilities. The absence of safe, continuous pedestrian facilities dissuades many potential transit patrons from using the bus system.

System Linkage

Aurora Avenue North is a major north/south arterial that serves both local and regional traffic within the City. Aurora Avenue North is a portion of signed SR 99 that extends from North Pierce County to North Snohomish County. The portion of SR 99 within the City of Shoreline connects SR 104 and SR 523. In addition to serving intra-City traffic, the route serves as a regional link between cities in the Puget Sound region.

Since 1996, WSDOT has listed this corridor as a critical need in its 20-year highway system plan. It appears on WSDOT's financially-constrained list of projects and is considered a high priority. The portion of SR 99 that lies within the City of Shoreline has also been identified by the Washington State Transportation Commission as a highway of statewide significance, critical to statewide and regional intermodal mobility needs.

Aurora Avenue North is identified by WSDOT as a truck freight route. It carries more than 5 million tons of freight annually and is classified as a T2 tonnage class roadway. The Shoreline portion of Aurora Avenue North is located in a dynamic and complex regional transportation system. The City geographically connects the City of Seattle to the south with Snohomish County to the north. This portion of SR 99 has been identified as part of King County's Regional Arterial Network and Puget Sound Regional Council's (PSRC) Metropolitan Transportation and Freight and Goods Systems. Aurora Avenue North also provides a connection between other routes on the Regional Freight and Goods System, including Westminster Way/Greenwood Avenue (T2), SR 523 (T3), North 185th Street (T2), and SR 104 (T3). Lane capacity improvements at signalized intersections are needed to improve capacity and the LOS along Aurora Avenue North to move people and goods more efficiently through the corridor. The timely delivery of goods is extremely important to business operations and economic vitality.

Transportation Demand

In May 2001 the PSRC adopted the Regional Transportation Plan (RTP), the Transportation Element of Destination 2030, and the Regions' adopted growth and transportation strategy. The RTP is a detailed, long-range plan for future investments in the central Puget Sound region's transportation system. It responds to legislative mandates such as TEA-21, the Clean Air Act (CAA), the Commuter Trip Reduction Act, and the Growth Management Act (GMA). It is also intended to respond to regional concerns of pressing regional transportation problems. The basic building blocks for the RTP are city, county and transit agency plans, adopted multi-county and county-wide planning policies, and WSDOT Multimodal and Transportation System Plans.

The City of Shoreline's Aurora Avenue North Corridor Improvement project satisfies the following regional policies:

- Optimize and manage the use of transportation facilities and services
- Manage travel demand by addressing traffic congestion and environmental objectives
- Focus transportation investments by supporting transit- and pedestrian-oriented land use patterns
- Expand transportation capacity by offering greater mobility options

Improvement to SR 99 through the City of Shoreline is included in the list of capital projects identified by the MTP as a critical project and part of the Metropolitan Transportation System required to satisfy regional needs in 2020. It also indicates an estimated end date of 2010.

Needs Identified in Comprehensive Plan and Pre-Design Study

City of Shoreline Comprehensive Plan

The needs for improvements along Aurora Avenue North have long been recognized by local governments. Before the City of Shoreline was incorporated, King County initiated a project to provide transit enhancements along Aurora Avenue North. After incorporation, the City requested that the project be postponed until the City could complete its comprehensive planning process to define improvements in the Aurora Avenue North corridor. The City's Comprehensive Plan identifies the City's vision of the corridor (see

Chapter 4 – Relationship to Plans and Policies). Revitalization of the Aurora corridor is the primary supporting project of the adopted Comprehensive Plan.

The Council adopted the *City of Shoreline Comprehensive Plan* on November 23, 1998. The plan sets forth a number of broad goals for addressing the land use and transportation needs of the City through redevelopment of Aurora Avenue North into a safe, multimodal facility to serve as the vibrant backbone of the City. The Comprehensive Plan guidance recommendations were an outcome from a SEPA EIS process that evaluated environmental impacts and underwent public outreach.

The Comprehensive Plan identified a number of Framework Goals that the plan intended to achieve, in part through redevelopment in the Aurora corridor. Those that apply to the Aurora corridor were:

- Accommodate anticipated levels of growth and enhance the quality of life within the City of Shoreline
- Pursue a strong and diverse economy and ensure that economic development complements neighborhood character
- Improve multimodal transportation systems that provide for the City's present and future population

  Specifically, Goal LU VII is to *"redirect the changes in the Aurora Corridor from a commercial strip to distinct centers with variety, activity and interest by:*

  - *Balancing vehicular, transit, and pedestrian needs*
  - *Creating a "sense of place" and improving image*
  - *Protecting neighborhoods*
  - *Encouraging businesses to thrive*
  - *Using a strategy based on sound market principles"*

The Comprehensive Plan further specifies that sidewalks, street trees, pedestrian crossings, and other pedestrian amenities be provided.

In the City's Transportation Element, the plan calls for striking a balance between mobility, congestion relief, safety, and access to transportation alternatives such as transit, pedestrian facilities, and bicycle systems.

Corridor Pre-Design Study

A comprehensive study of corridor transportation concepts was conducted in 1999. As part of the study's community and agency involvement program, the Citizen Advisory Task Force (CATF) was created to give input and direction on design issues and options, alternatives, and evaluation criteria. The CATF consisted of City residents, business owners, and other community members who have an interest in the project or who own property within the study area. The CATF's goal in the Aurora Corridor Pre-Design Study was to develop a design concept that:

- Improves safety for pedestrians and vehicles
- Improves aesthetics and image of the street
- Adds people-moving capacity

- Supports existing and future business investments along the street

Such a concept was to meet the transportation, safety, and economic goals outlined in the Comprehensive Plan. The study evaluated a wide range of concepts, and the evaluation included consideration of transportation, environmental, and economic factors. The CATF, after review of evaluation results and public input, unanimously selected a programmatic alternative (designated Alternative 2) for further development and eventual recommendation to the City Council. Project-level alternatives were to be based on the CATF's selected programmatic alternative in order to meet the goals stated by the City.

The main features of the pre-design concept include

- Addition of business access/transit (BAT) lanes on the outside of the roadway
- Construction of curbs, gutters, landscaping/street amenity zone, and sidewalks on both sides
- Creation of landscaped center median/safety lane with left- and U-turn pockets

The recommendation also included four new signalized intersections and four new pedestrian-activated signalized crossings.

Goals and Objectives of Project

The goals and objectives of this project are to improve the economic development potential of the corridor, to provide for the enhancement of livability for communities adjacent to the corridor, and to be in agreement with the City's Comprehensive Plan for land use decisions under the Growth Management Act while recognizing the regional importance of the street in the overall transportation network.

Description of Project Study Area

Aurora Avenue North (SR 99) is a major north/south urban highway that serves both local and regional traffic in north Seattle and within the City of Shoreline (City), Washington. Within the City, it is the major traffic artery, with links to I-5 through connections at North 145th Street, North 175th Street, and North 205th Street.

The proposed Aurora Avenue North Multimodal Corridor Project: North 145th Street to North 165th Street (Aurora Corridor Project) is to improve Aurora Avenue North between North 145th Street and North 165th Street. This area is located within the larger Aurora Avenue Commercial Zoning District, which is bounded by residential neighborhoods. The majority of the construction activity would occur within approximately 50 feet of the Aurora Avenue North right-of-way. At intersections, minor construction or restriping would extend various distances from Aurora Avenue North to accommodate matching into existing traffic lanes. The approximate distances at the different intersections would be as follows:

- North 145th Street—Approximately 670 feet west, 575 feet south (along Aurora Avenue North), and 520 feet east
- North 149th Street—Approximately 125 feet west
- North 152nd Street—Approximately 500 feet east
- North 155th Street—Approximately 550 feet west (joining Westminster Way) and 480 feet east
- Westminster Way—Approximately 1,500 feet southwest (including intersection with North 155th Street)
- North 160th Street—Approximately 550 feet west and 200 feet east
- North 163rd Street—Approximately 175 feet west
- North 165th Street—Approximately 400 feet west, 720 feet north (along Aurora Avenue North), and 150 feet east

The area of environmental impact associated with the proposed project differs for each environmental discipline. The study areas for each discipline are defined by the extent of issues and impacts unique to each discipline. The range of the areas of impact analyzed varies from the properties immediately adjacent to the roadway, to the City as a whole, to entire watershed basins.

Project Termini and Why They Are Logical

This section describes the rationale for establishing the scope of the project, explains why the project termini are logical, describes the independent utility that these improvements will provide, and explains how this project will not preclude other forms of project designs along SR 99.

Rationale for Establishing Project Scope

During prior planning processes, the Aurora Avenue North improvements have been considered for the 3-mile corridor within the City of Shoreline. Activity to date relating to the 3-mile corridor program includes developing the Aurora Corridor Subarea and Comprehensive Plan vision, outlining traffic, safety, and roadway projects in the Capital Improvement Program (CIP), and a corridor pre-design study. A comprehensive environmental impact evaluation for the 3-mile Aurora corridor improvements throughout the City, along with related impacts of the Comprehensive Land Use Plan, was conducted in the Comprehensive Plan EIS in 1998. The proposed actions from North 145th Street to North 165th Street are compatible with the Comprehensive Plan, including city-wide transportation projects, and will implement the intended provisions of the plan between the proposed project termini.

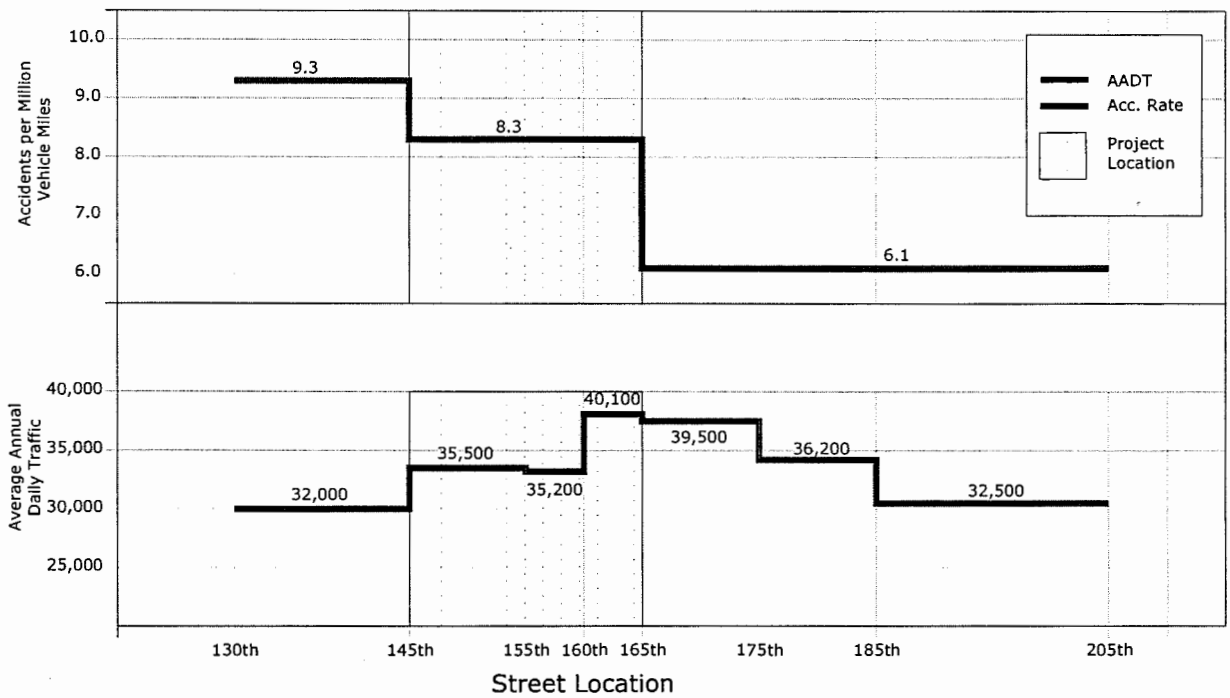
Transportation projects are typically set to logical termini based on the functional operation of the facility. The specific project limits are located at match-in points leading from street intersections. For arterial streets, the street intersections are the capacity constraint for traffic operations. Therefore, the project limits were established to include intersections at the termini and to provide adequate lane transition lengths to match existing lanes while at the same time minimizing cost and environmental impacts.

The portion of Aurora Avenue North from North 145th Street to North 165th Street (approximately 1 mile) currently has the highest average daily traffic volumes along the 3-mile roadway that lies within the City of Shoreline. These high volumes result from the large employers and the regional trip attractors that are located along or near this portion of Aurora Avenue North. These include the WSDOT Northwest Region office, Shoreline Community College (a commuter college), and the Aurora Square Shopping Center. The project limits also include the North 155th Street/Westminster Way merge – another reason for the large volume of traffic within this 1-mile stretch. Existing Average Annual Weekday Traffic in 2001 includes 35,000 vehicles per day (VPD) between North 145th and North 155th Streets, 35,200 VPD between North 155th and North 160th Streets and 40,100 VPD between North 160th and North 165th Streets. South of North 145th Street the traffic reduces to 32,000 VPD. North of the project the volumes reduce to 31,400 VPD in the vicinity of North 200th Street. These project limits include intersections with poor levels of service (LOS): North 145th Street at LOS-F; North 155th Street at LOS-E; and North 165th Street at LOS-F. Because this portion of Aurora Avenue North has the highest traffic volumes, the highest driveway density, and many of the most congested intersections, it the section of the roadway that has the greatest need for immediate improvement.

The high volume and high speed of traffic combined with the two-way, left-turn lanes and the high number of driveways creates a high potential for automobile crashes in this portion of Aurora Avenue North. This portion includes the highest traffic crash locations compared

to the rest of the corridor. In 2000, WSDOT identified this portion of the Aurora corridor to include five high-accident locations (HALs). These included North 135th to North 155th Streets, North 143rd to North 145th Streets, the vicinity of North 155th Street, North 160th-to-North 163rd Streets, and the vicinity of North 165th Street. The project limits also include three Pedestrian Accident Locations (PALs) in assessments made by WSDOT in 1998 and 2000. These are located in the vicinities of North 145th Street, North 152nd Street, and North 165th Street. Based on crash data provided by WSDOT for 1999 and 2000, the crash rate for North 145th Street to North 165th Street is 8.3 crashes per million vehicle miles, in comparison to 6.1 accidents per million vehicle miles from North 165th Street to North 205th Street. Because this portion of Aurora Avenue North includes HALs, PALs, and has very high crash rates and less safe roadway conditions, it is the portion in greatest need for immediate improvement.

Table 2-1
Project Location Accident and Traffic Data



Logical Termini

The exact termini for this project are listed on the first page of Chapter 2. The northern terminus was set at North 165th Street to incorporate the major trip-generating land uses and to accommodate that traffic within the project limits. The project limits and northern terminus include the intersection of North 165th Street because the vicinity of this intersection is identified by WSDOT as a HAL and a PAL. The intersection currently operates at a poor LOS of F (on a scale of A to F, with F being the worst condition;. see Transportation section of this document.) and neighborhood traffic access to Aurora Avenue North is difficult and unsafe. This intersection meets warrants for a traffic signal that would enable safe access to the roadway and pedestrian crossings of the roadway. Including this terminus in

the project allows for improvement of this intersection. Improvements at this terminus will address pedestrian and bus zone access to the transit-dependent population from the Arden Rehabilitation and Healthcare Center located at the northwest quadrant of the intersection. The terminus at North 165th Street is located approximately 0.5 mile from North 175th Street so that it does not preclude consideration of future design options in the vicinity of that intersection.

The southern terminus was set at North 145th Street, which is also designated SR 523, and is the southern gateway/access point to the City of Shoreline. The southern terminus of this project is logical because it is located at a signalized intersection that serves as an access point for traffic flow from North 145th Street/SR 523 and onto Aurora Avenue North. It also will provide continuity with the existing northbound BAT lane on Aurora Avenue North that extends from North 115th Street to North 145th Street within the City of Seattle. The project limits and southern terminus include transition improvements south of the intersection of North 145th Street that will improve this existing High Accident/Pedestrian Accident location. The North 145th Street intersection currently operates at LOS F. The project is a part of the City of Shoreline's CIP and, therefore, will not be designed south of North 145th Street (in the City of Seattle) except to provide for adequate transition. The development of improvements to Aurora Avenue North to the south of North 145th Street is under the jurisdiction of the City of Seattle and WSDOT.

How This Project Will Provide Independent Utility

Improvements associated with the Aurora Project from North 145th Street to North 165th Street would provide independent utility regardless of whether or not additional improvements were made elsewhere along the corridor. Needs such as traffic and pedestrian safety, traffic capacity, and transit access and operation would all be addressed without shifting or aggravating problems and needs along the rest of the corridor. For example, implementing access management treatments from North 145th Street to North 165th Street would reduce the number of conflict points and would improve safety within the corridor (in the area with the highest accident rates), regardless of any other action taken along Aurora Avenue North. Similarly, providing business access (acceleration/deceleration) lanes on Aurora Avenue North near high-traffic-generating land uses would improve traffic flow and reduce traffic delays compared to No Build conditions. The improvements would not require immediate transportation improvements along the remainder of Aurora Avenue North. Likewise, transit access improvements and amenities from North 145th Street to North 165th Street would provide independent utility, but would not require additional improvements north and south of the project area. Pedestrian safety improvements from North 145th to North 165th Street would provide immediate reduction in traffic accidents involving pedestrians, but would not require additional improvements north or south of the project area to achieve this benefit.

How This Project Will Not Preclude Options North or South

Improvements made along Aurora Avenue North from North 145th Street to North 165th Street will not preclude other forms of project designs elsewhere along the same arterial. This has been demonstrated in the region. For example, the SR 99 project constructed recently just north of North 205th Street in the City of Edmonds does not dictate the type of improvements proposed by the City of Shoreline starting at North 205th Street southward.

In fact, the improvements can be fundamentally different, reflecting the local needs and context of each project. In downtown Seattle, WSDOT is evaluating different designs, including elevated highways and tunnels, as potential replacements for the SR 99 Alaska Way Viaduct and those designs will not dictate the type of improvements in the City of Shoreline. Other projects along SR 99 in south King County (Cities of Tukwila, SeaTac, Des Moines, and Federal Way) all have varying design features, but do not preclude the design options that can be considered for the Aurora Project from North 145th to 165th Streets.

Transitions from the new cross section for the alternative designs for this project to the existing cross section at the termini will be addressed through the construction of lanes and lane tapers to accommodate the merge of transit and right-turning vehicles at the project termini south of North 145th Street and north of North 165th Street. The general-purpose traffic using the BAT lanes that are a part of each design alternative will be required to turn right and exit Aurora Avenue North either at driveways to properties or at street intersections. Therefore, vehicles making the through movement in the BAT lane at each termini will be limited to transit vehicles, which can be given priority or special advance timing to facilitate the merge of buses back into general-purpose traffic. This merge action will be of no greater impact than currently occurs in locations along Aurora Avenue North where transit vehicles pull onto the shoulder to unload and load passengers and then reenter the traffic lanes. Vehicles using the taper lane to make right turns onto Aurora Avenue North will have some distance in which to merge into the through traffic lanes.

The City is conducting a Central Sub-Area Study for the area along Aurora Avenue North from approximately North 172nd Street to North 187th Street. Entirely different design configurations for Aurora Avenue North, including the connection of Ronald Place in the vicinity of North 172nd Street, may be considered for that area. If those options include grade separations with ramp connections to Aurora Avenue North, those designs would potentially extend southward to about North 170th Street. Therefore, for future environmental reviews for the portion of the corridor north of North 165th Street or south of North 145th Street, new information and alternatives can be considered and implemented independent of this project.

WSDOT is currently conducting a study of Aurora Avenue in Seattle from the Battery Street Tunnel to North 145th Street. The City of Seattle and the City of Shoreline are participating agencies in that study. Improvements on Aurora Avenue in the City of Shoreline will continue to be coordinated with planning for improvements in Seattle to the south of North 145th Street.

Alternatives Examined but Rejected

Alternatives from Pre-Design Screening

In 1999, the City of Shoreline carried out a screening process to reduce the number of concepts as well as a scoping process to create reasonable concept-level alternatives to forward for additional study. (See Appendix A for a complete description of the scoping process.) Two advisory committees—Citizen's Advisory Task Force (CATF) and Interagency Technical Advisory Committee (ITAC)—collaborated to develop three design alternatives for evaluation in determining the preliminary preferred alternative. A number

of conceptual project alternatives were considered in the pre-design process but were screened out or rejected for a number of reasons, including failure to meet the purpose and needs (e.g., vehicular safety, roadway deficiencies, economic development, capacity, modal interrelationships) and/or because there were potential, substantial environmental impacts. These alternatives that were considered, but rejected, include the following:

- A proposed tunnel with termini at approximately North 170th Street and North 188th Street was determined to be infeasible due to the extremely high construction, operations, and maintenance costs for which the City would be responsible.
- A proposed couplet system that involved using Midvale Avenue North for northbound traffic and Aurora Avenue North for southbound traffic was rejected due to the magnitude of change from the existing traffic patterns and the impacts on business access, the Interurban Trail, and neighborhood quality-of-life.
- A proposed parallel limited-access facility within the Seattle City Light transmission right-of-way that would serve trips moving through the City was rejected because it conflicted with needs for existing and future transmission lines and with the Interurban Trail's plan to use the right-of-way.
- Proposed development of a grid system of streets in the corridor that would balance trips made along Aurora Avenue North between several parallel routes was rejected due to neighborhood impact concerns.

Three alternatives were carried forward for additional screening. Alternative 1 was oriented toward providing local access and keeping the roadway in its existing configuration (four general-purpose lanes with a center two-way left-turn lane), but adding sidewalks, landscaping, and urban design amenities. Because no capacity would be added, some of the anticipated future traffic volume would have to be accommodated on other north/south roadways including I-5, Meridian Avenue, Dayton Avenue, and 15th Avenue. This alternative also included some on-street parking pockets, bus pullouts, and queue-bypass lanes at intersections to separate buses from general congestion. Safety design changes were made at spot locations. Its design was oriented toward providing local access.

Alternative 2 provided balance between regional and local access, adding a business access and transit (BAT) lane in each direction, sidewalks, landscaping, and urban design amenities. In addition, the existing two-way left-turn lane was converted to a focused left-turn and pedestrian-refuge area that includes some landscaping. The approximate estimated traffic capacity (in 2015, the original design date) of Aurora Avenue North increased to 45,000–50,000 vehicles per day. Enhanced bus zones with bus shelters were established with transit signal priority. This alternative also included additional signalized intersections and pedestrian crossings.

Alternative 3 was oriented toward providing more regional access. It converted Aurora Avenue North from a major urban arterial into a limited-access expressway. The approximate estimated traffic capacity increased to 55,000–60,000 vehicles per day. Under this alternative, frontage roads provided local access, while access to and from Aurora Avenue North was restricted to interchanges located along this portion. These intersections were grade-separated, as were pedestrian crossings.

Criteria used to evaluate the three alternatives were based on the three broad categories of need (see Chapter 1 – Purpose and Need of the Proposed Project): safety, efficient traffic movement, and economic opportunity. Specifically, they included:

- Economic factors related to funding feasibility, economic development, and cost
- Environmental factors related to both the natural and physical environments
- Mode-choice factors related to the relative benefit provided to alternative (i.e., non-SOV) transportation modes
- Operations factors related to how well the facility operates based on performance measures such as safety, speed, and level of service (LOS)

Alternative 1 was found to have the lowest right-of-way needs and environmental impacts because it had a minimal cross section. However, because of the high number of traffic conflicts, on-street parking, heavy congestion, and the center two-way left-turn lane, Alternative 1 provided the least improvement to traffic safety. Alternative 1 was also expected to shift substantial traffic volumes to parallel routes, including Meridian Avenue, Fremont Avenue, and Dayton Avenue as well as onto roadways east of I-5 and onto local streets. Therefore, it did not meet most of the purpose and needs required of the project.

Alternative 3's main advantage was in traffic safety, where barrier separation and one-way frontage road operations improved safety conditions. However, Alternative 3 did not perform well environmentally, provided no economic benefit to the corridor, and drew traffic off of I-5. It required extensive property acquisition to accommodate widening at intersections to maintain LOS. It did not meet most of the purpose and needs in the corridor.

Overall, Alternative 2 addressed the purpose and needs of the corridor better than the other alternatives. Alternative 2 had the highest funding feasibility score, the least neighborhood spillover traffic, and the greatest improvement to transit operations. Alternative 2 had a more favorable set of design features, a better regional/local balance, and provided more benefits in terms of traffic operations (LOS), safety, and mode-choice. Pedestrian safety was improved the greatest under Alternative 2.

The CATF, after review of evaluation results and public input (see Chapter 6 – Coordination and Comments), selected Alternative 2 for further development and recommendation to the City Council. Project-level alternatives were to be based on the CATF's selected alternative to meet the purpose and needs stated by the City. This proposed concept for Aurora Avenue North was reviewed by the City Council and adopted in Resolution 156.

Alternatives from Scoping

Agencies, affected tribes, and members of the public were invited to comment on the scope of this document as a formal part of the State Environmental Policy Act (SEPA) scoping process in an August 2, 2001, notice to the public. Two refinements of Alternative 2 were presented in the scoping notice. Comments were accepted in writing during the 3-week scoping period. Several additional alternatives and variations of the proposed alternatives were submitted by the public during the scoping period. These alternatives and the reasons they were not included in the final evaluation are presented below.

5' sidewalks, 2 northbound and 2 southbound general-purpose lanes, center 2-way left-turn lane, no new signals, and amenities on private property

The alternative is similar to the Alternative 1 that was studied in the Aurora Corridor Pre-Design Study, except that sidewalks are proposed to be 5 feet wide and landscaping and other amenities are behind the sidewalks on private property. No provisions for improving pedestrian crossings of Aurora Avenue North are included. No additional signals are provided to allow safe pedestrian crossings. Therefore, this alternative would not substantially enhance pedestrian access and would not help reduce the number of crashes involving pedestrians. In addition, the alternative would not comply with WSDOT access management standards and, therefore, would not sufficiently improve traffic safety. Traffic crashes would remain at high levels with continued risk of severe crashes, including fatalities. These standards require that raised medians be installed to mitigate unsafe crossing, merging, and diverging conflict points for facilities serving the volume of traffic currently using Aurora Avenue North. The *City of Shoreline Comprehensive Plan* indicates that Aurora Avenue North be improved as a multimodal corridor. The lack of transit amenities would extend the current automobile orientation along the corridor and do little to encourage use of transit. This would hinder the economic development vision outlined in the Comprehensive Plan. Due to its similar lane configuration with the above-mentioned Alternative 1, it is anticipated that this alternative would not provide sufficient traffic capacity to handle transportation demands.

5' sidewalks, 13' northbound and southbound BAT lanes, two 11' northbound and southbound general-purpose lanes, 14' two-way left-turn lane, amenities on private property

No provisions for improving pedestrian crossings of Aurora Avenue North are included. No additional signals are provided to allow safe pedestrian crossings. Therefore, this alternative would not substantially enhance pedestrian access and would not help reduce the number of crashes involving pedestrians. In addition, the alternative would not comply with WSDOT access management standards. These standards require that raised medians be installed to mitigate unsafe crossing, merging, and diverging conflict points for facilities serving the volume of traffic currently using Aurora Avenue North and would not sufficiently improve traffic safety. Traffic crashes would remain at high levels with continued risk of severe crashes, including fatalities.

Alternative B is similar to this alternative, and includes the concept of narrow sidewalks with amenities on private properties (see "Project Alternatives" at the end of this chapter); however, Alternative B has been modified to address the critical Purpose and Need issues, such as traffic and pedestrian safety.

7' sidewalks, (0.5' curb), two 11' northbound and southbound general purpose lanes and one 14' northbound and southbound general-purpose lane (on outside), 12' two-way left-turn lane (based on "Lynnwood model")

No provisions for improving pedestrian crossings of Aurora Avenue North are included. No additional signals are provided to allow safe pedestrian crossings. Therefore, this alternative would not substantially enhance pedestrian access and would not help reduce the number of crashes involving pedestrians. This proposal does not meet the current WSDOT access management standards and would not sufficiently

improve traffic safety. Traffic crashes would remain at high levels with continued risk of severe crashes, including fatalities. It does not encourage transit use or support the City's economic development vision.

Alternative B is similar to this alternative, and includes the concept of narrow sidewalks with amenities on private properties (see "Project Alternatives" at the end of this chapter); however, Alternative B has been modified to address the critical Purpose and Need issues, such as traffic and pedestrian safety.

Accommodate high-speed traffic – No U-turns, no additional signals

This alternative would promote "high-speed traffic" instead of a balance between through traffic and access to adjacent properties. Additional signals will be needed to provide access along and across Aurora Avenue North for minor street traffic because the increase in traffic volumes will reduce the available gaps for such movements. Lack of any new signals in the design will make access from side streets, such as North 152nd Street, very unsafe. High-speed traffic would require elimination of driveways (limited access) and installation of a solid barrier-type median. There would be no local economic development benefits associated with this alternative, aesthetics would not be improved, and multimodal transportation would not be encouraged. This alternative would not improve the image of the community and corridor. The *City of Shoreline Comprehensive Plan* specifies that sidewalks, street trees, pedestrian crossings, and other pedestrian amenities be provided.

Improvements restricted to sidewalks and lighting on residential streets (to improve pedestrian safety)

This alternative would make no improvements to Aurora Avenue North, which would not support the Comprehensive Plan goals for the Aurora corridor or any of the corridor's needs. Safety would not be improved, no enhancements for economic development would be provided, and no capacity or transit mobility would be provided.

12' Through Lanes on Each Alternative Instead of 11' Lanes

The 11-foot through lanes are practical and appropriate widths for the urban arterial context and are common to widths found along the SR 99 corridor. Designing Aurora Avenue North with 12-foot lanes would add 6 feet to the width of the corridor. This would increase the width of Aurora Avenue North up to 118 feet. The additional width could not be accommodated by reducing the sidewalk width without compromising the pedestrian environment and, in some cases, safety. The extra width of right-of-way needed to accommodate this cross section would have serious environmental impacts. Substantially more private property would need to be acquired to implement 12-foot lanes. This would result in more land acquisition, business displacements, and more parking loss with less room left over for reconfiguration. Also, all of the additional street width would be impervious, which would increase the amount of surface water runoff that would require detention and treatment.

Design Alternatives to Meet Full WSDOT Design Level

The City has coordinated with WSDOT regarding the appropriate design guidelines for this project. Through that process, WSDOT has provided direction that this project does not fall within typical design classes for Full Design Level guidance. Based on the type and context of this project, a modified design classification will be developed and approved for this specific project, allowing 11-foot-wide general-purpose lanes, a 12-foot-wide lane adjacent to the median curb, and an 11-foot-wide (w/a 2-foot shy) Business Access/Transit (BAT) lane and up to a 16-foot-wide median with a 4-foot-wide median at the intersections. The 11-foot-wide general-purpose through lane is a practical and appropriate width for the urban arterial context and is a common interior lane width along the SR 99 corridor.

While designing Aurora Avenue North to full design level lane widths may have some operational benefit, the added width of 12-foot-wide lanes would add another 6 feet to the cross section of the project. Widening the median from 4 feet to 6 feet would further increase that by 2 feet. The extra right-of-way needed to accommodate such a cross section would have serious socioeconomic impacts. Substantially more private property would need to be acquired to implement 12-foot-wide lanes plus a 16-foot-wide median (4-foot-wide median at intersections). This would result in additional land acquisition, business displacements, and parking loss with less room left over for reconfiguration of parking areas. All of the additional pavement width for the lanes would be impervious, which would increase the amount of surface water runoff that would require detention and treatment. Providing a 4-foot-wide outside shoulder would allow for bike use; however, there are parallel bike facilities, which substantially limits bike use on SR 99.

None of the alternatives and options described above would meet the project's Purpose and Need (see Chapter 1); therefore, they have not been included in this document for full environmental analysis.

Project Alternatives

The Aurora Corridor Project is intended to enhance the safety of all users and improve the economic development potential of the business district while recognizing the regional importance of the Aurora Avenue North in the overall transportation network between North 145th Street and North 165th Street. Both build alternative would have a seven-lane configuration. The advantages of the proposed seven-lane configuration are:

- Additional and adequate capacity in the northbound and southbound directions (with added intersection improvements and interconnection between signals)
- Increased safety because a median would control left-turn movements into and out of driveways, thus reducing potential conflict points (Note: there would be more conflict points under Alternative B than under Alternative A)
- Increased safety because there would be continuous sidewalks and pedestrian lighting, continuous roadway lighting, and pedestrian refuge areas in the center median
- Improved local and regional transit because there would be dedicated northbound and southbound BAT-only lanes

- Improved aesthetics and visual continuity with construction of landscaping, illumination, and pedestrian facilities

The project location is shown in Figure 2-1.

No Action Alternative

Under the No Action Alternative, no new major construction activities described in the project proposed action would occur. Short-term minor construction necessary for continued operation of the existing roadway facility would be accomplished, and minor safety improvements could be constructed as required.

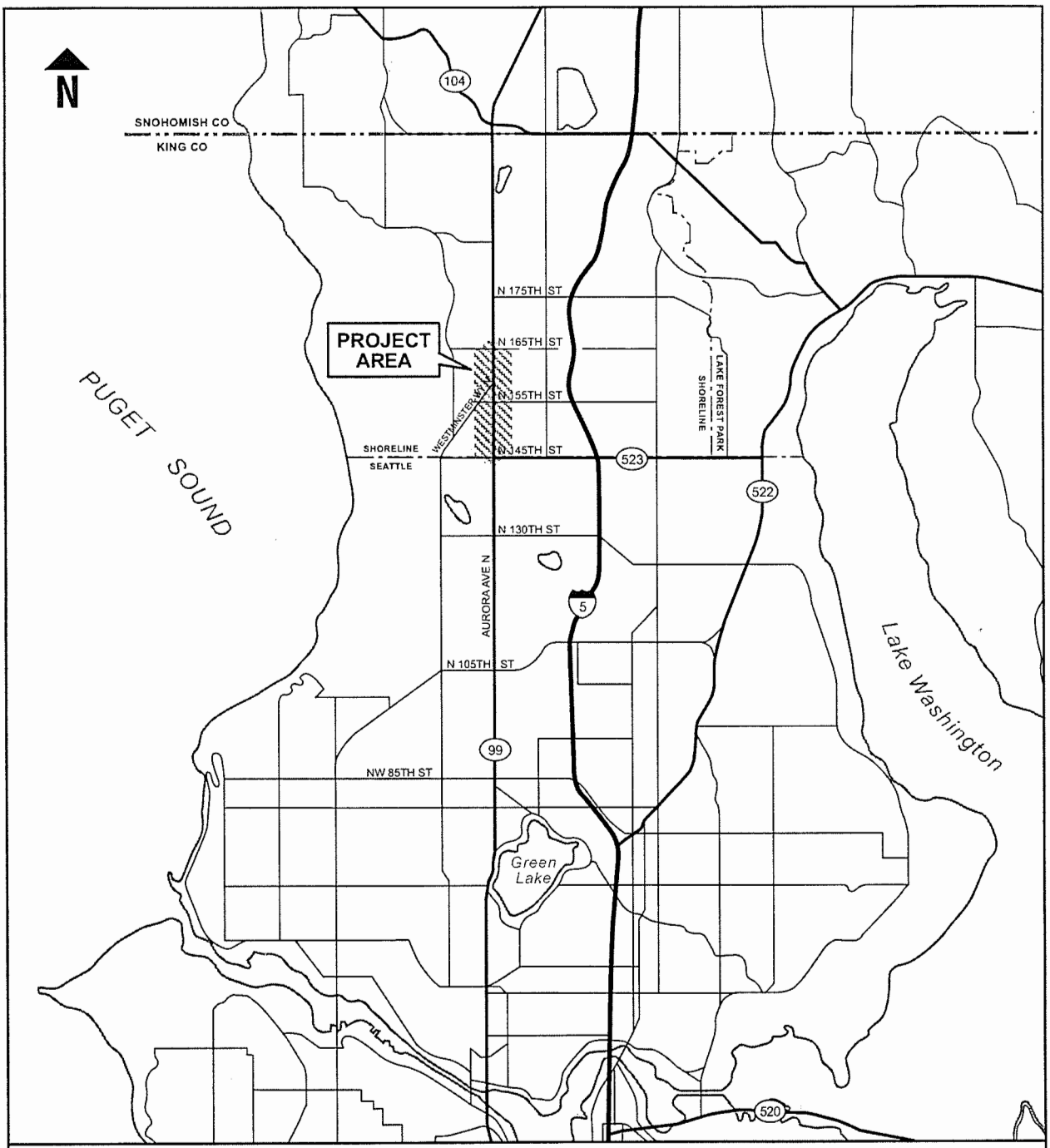
The No Action Alternative includes other currently funded or planned transportation improvements projects expected to be in operation in the project area by 2020. These baseline transportation improvement projects are identified in the City of Shoreline Capital Improvements Program, updated annually. These baselines improvement projects are not specifically addressed in this environmental document, but will be the subject of separate project-specific environmental reviews. These projects are considered in the analysis of secondary and cumulative impacts. Currently, Aurora Avenue North within the project limits is a five-lane roadway with two general-purpose traffic lanes in each direction and a continuous two-way, left-turn lane in the center. The width of the pavement varies from 55 to 130 feet because the shoulders are paved and some intersections have dual left-turn lanes, allowing for five standard-width (12-foot) traffic lanes in one direction. Sidewalks are present at a few locations throughout the project area, but are not continuous. There are numerous private driveways with undefined limits along both sides of the roadway. Pedestrian crossing locations are provided only at signalized intersections (North 145th Street, North 155th Street, and North 160th Street). Figure 2-2 shows typical cross sections of the alternatives along Aurora Avenue North within the project area.

Average daily traffic volumes in the project area range from 35,000 to 40,000 vehicles per day. Traffic volumes on this roadway are increasing at a rate of 3 to 5 percent per year, and traffic at many of the signalized intersections along the corridor is above capacity during the peak commuting periods. These conditions result in traffic congestion and high crash rates. In addition, conditions for pedestrians and transit along Aurora Avenue North are poor. Land use is predominantly commercial "strip" development.

Alternative A

Alternative A proposes construction of continuous 8-foot-wide sidewalks (with an adjacent 4-foot-wide amenity zone and 6-inch curb) that extend the length of the project area, and seven lanes of traffic (two general-purpose lanes and one continuous Business Access/Transit [BAT] lane northbound and southbound, and one center lane for left/U-turn pockets/median). A cross section is shown in Figure 2-2. The BAT lane would serve transit buses and right-turning, general-purpose vehicles. Transit buses would be allowed to operate in the BAT lane throughout the entire length of the Aurora Corridor Project area. The BAT lane would also allow general-purpose vehicles entering and exiting businesses to accelerate and decelerate in a dedicated lane without affecting the speed of through traffic. This low-volume lane will enhance safety by improving access to and from businesses and properties along Aurora Avenue North and also will increase the capacity of the general-

159851.SH.05.01_t082001024sea. Fig 2-1 project location 10-25-01 gr/lg

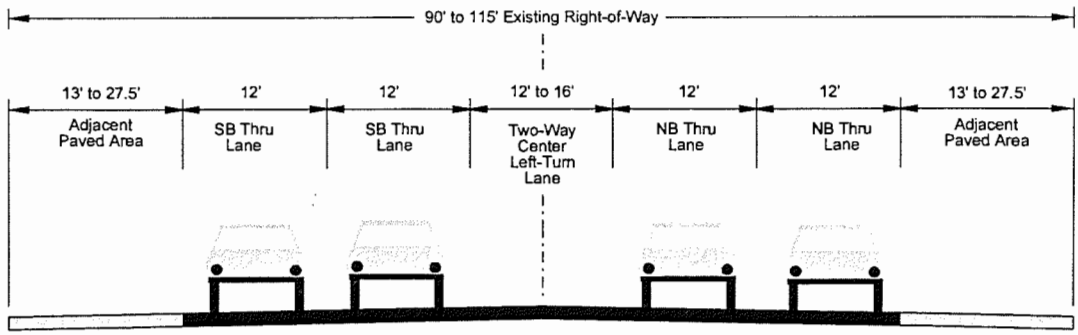


CITY OF SHORELINE

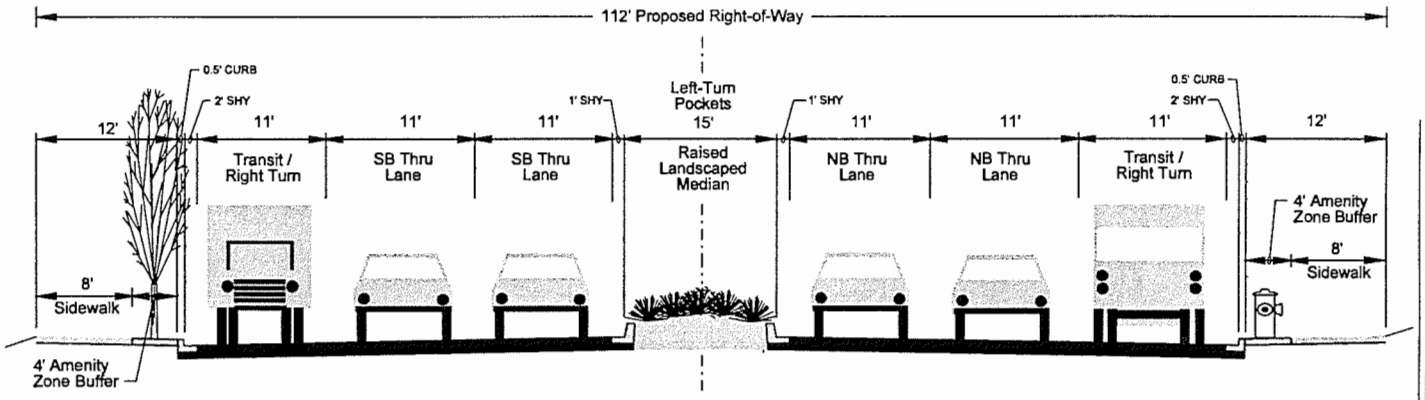
Aurora Avenue North Multimodal Corridor Project:
North 145th Street to North 165th Street

Figure 2-1

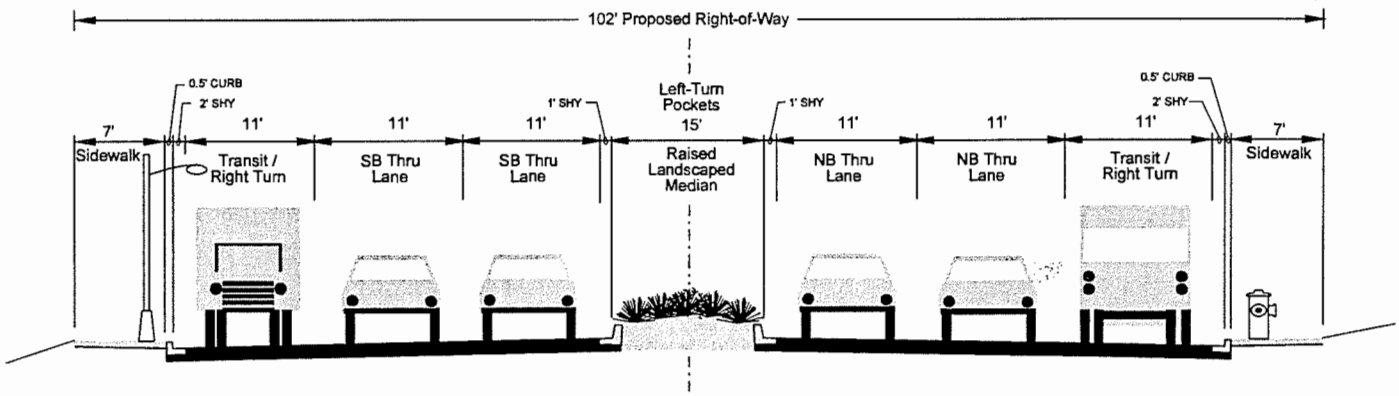
Project Location



No Action Alternative
Typical Cross Section at Mid-Block



Alternative A
Typical Cross Section at Mid-Block



Alternative B
Typical Cross Section at Mid-Block

CITY OF SHORELINE

Aurora Avenue North Multimodal Corridor Project:
North 145th Street to North 165th Street

Figure 2-2
Typical Cross Sections

purpose through lanes by allowing traffic to maintain constant speeds. General-purpose vehicles in the BAT lane would be required to turn right at each street intersection. The center median would be continuous between signalized intersections, except for three openings—one for left turns (westbound) onto North 149th Street, one for left turns (eastbound) into the Seattle Restaurant Store (at 14910 Aurora), and one for left turns (westbound) onto North 163rd Street (see Figure 2-3). Left/U-turn lanes will be provided at the intersections with North 145th Street, North 152nd Street, North 155th Street, North 160th Street, and North 165th Street. The width of the median would be reduced to 4 feet approaching signalized intersections to provide left-turn pockets. In addition, dual left-turn lanes would be provided northbound at North 160th Street and eastbound at North 155th Street. A right-turn lane would also be constructed southbound at North 155th Street.

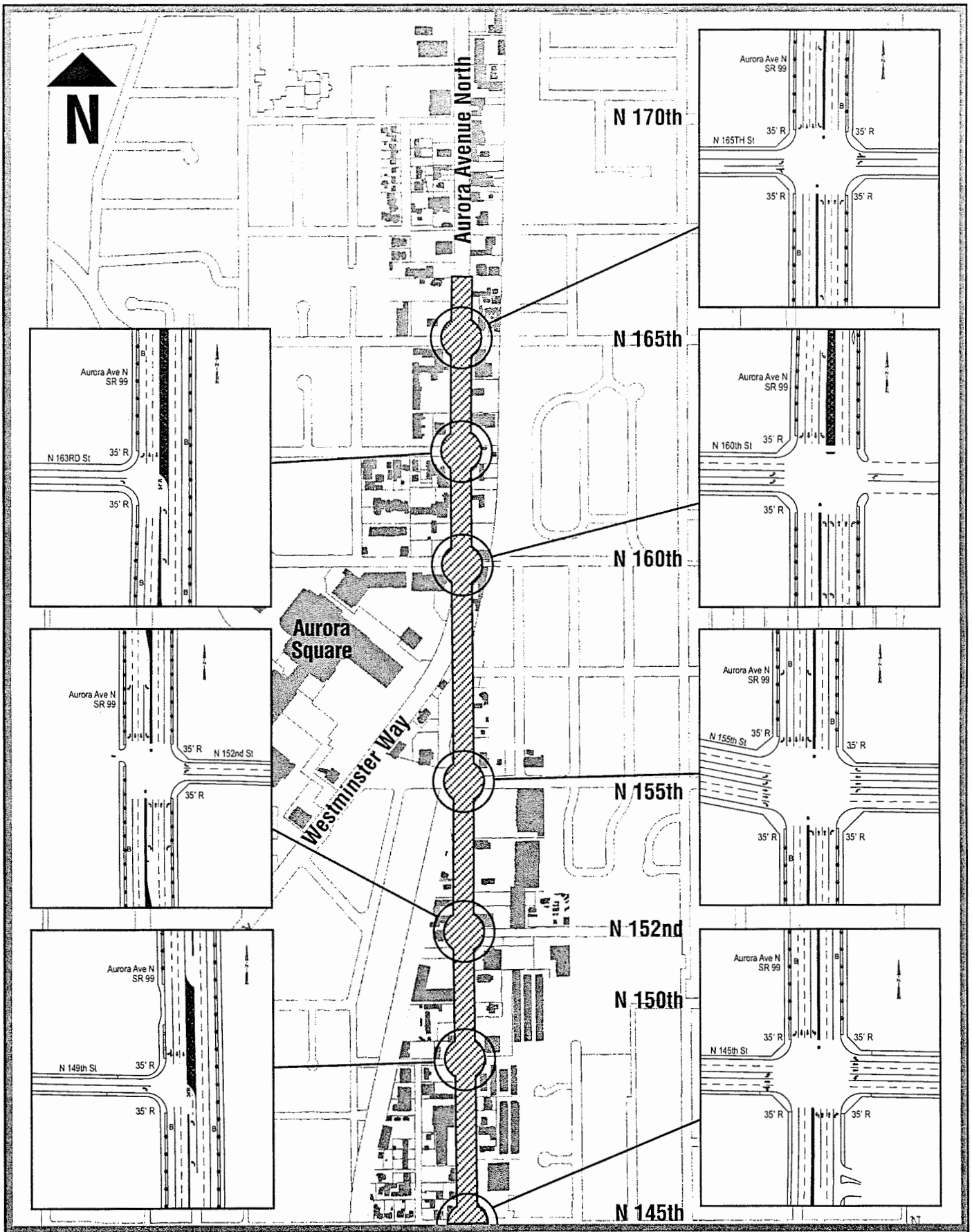
Additional proposed improvements include constructing curbs and gutters on all sidewalks, planting street trees, and providing other pedestrian amenities. Continuous 8-foot-wide sidewalks would be constructed along both sides of Aurora Avenue North to provide pedestrian walkways that are safe and attractive. A 4-foot-wide amenity zone would be constructed adjacent to the 6-inch curb, and would serve as a buffer between pedestrians and street traffic. Pedestrian railings will be provided as necessary to protect pedestrians at vertical grade separations, such as along retaining walls. The project includes installation of new traffic signals at North 165th Street and North 152nd Street and signal modifications at North 145th Street, North 155th Street, and North 160th Street. Bus shelters would be built at specific locations and illumination would be added throughout the corridor. Lighting includes pedestrian lighting and roadway lighting in the landscape amenity zone along the new sidewalks and illumination of pedestrian and transit stop facilities. In addition, overhead utilities would be relocated underground and the stormwater drainage system would be improved.

Construction Staging

The City of Shoreline has not yet prepared a detailed construction schedule. However, the right-of-way acquisition process is expected to start in July 2002 and last up to 12 months. This would be followed by construction (as described below) lasting up to 18 months. Because the proposed project requires many activities, the actual construction sequence has not been worked out in complete detail. The contractor will propose a construction sequence after contract award to most efficiently accomplish the work. This potential construction activity description is a general guide to understanding the steps necessary to complete the proposed facility. It is not to be construed as the final sequencing plan. The initial stage of construction would involve shifting the two northbound lanes (i.e., the eastern lanes of Aurora Avenue North) to the west between the outside of the proposed sidewalk and the existing old 44-foot-wide concrete roadway. The remaining roadway would be wide enough to maintain at least four lanes of traffic (two northbound and two southbound) during the first stage of construction.

General construction activities during the first stage would involve relocating aboveground and belowground utilities. Many of these utilities would be placed in a common trench.

The first stage of construction would also involve construction of curbs and gutters, sidewalks, driveways, and other off-road appurtenances, and improvements to the stormwater drainage system. The City would explore and consider the possibility of



159851.SH.05.16_t082001017sea / Fig 2-3 Alternative A / 12-14-01 / jg/gr

CITY OF SHORELINE

Aurora Avenue North Multimodal Corridor Project:
North 145th Street to North 165th Street

Project Area Limits

B Business Access/Transit Lane

Figure 2-3
Alternative A

performing certain construction tasks at night to minimize daytime traffic delays and to speed the construction process. Only relatively quiet construction activities would be considered for nighttime.

The second stage of construction would involve shifting the through traffic lanes of Aurora Avenue North to the east, and using the newly constructed improvements on the eastern side. During the second stage, the area from the outside of the proposed sidewalk to the existing old 44-foot-wide concrete roadway would be constructed.

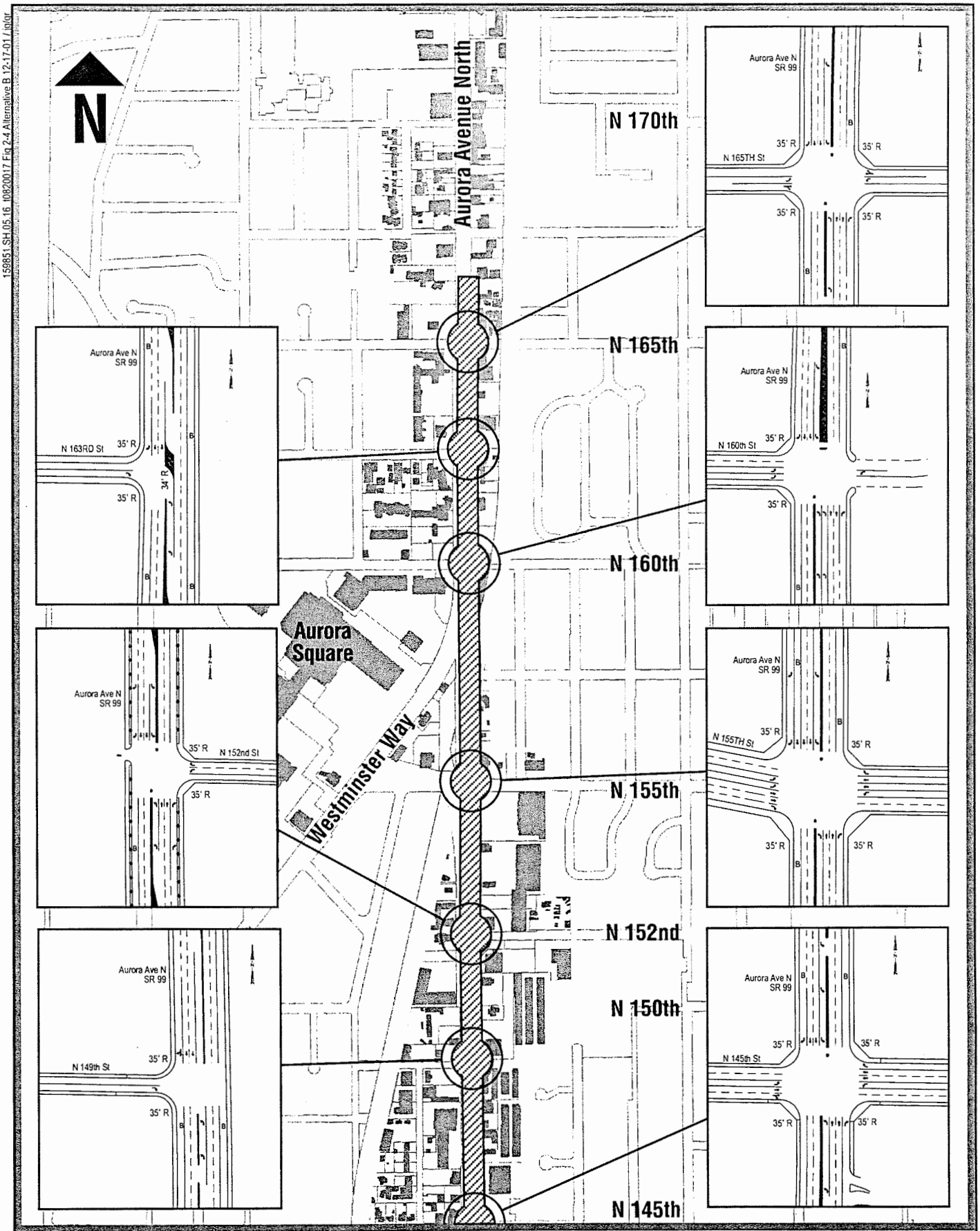
The third stage of construction would involve closing the center section of Aurora Avenue North and shifting through traffic to the recently completed outside lanes. The center section would be approximately 44 feet wide and is the area above the old concrete pavement. General construction activities during this stage would include the cross street connection of the stormwater drain stubs and other utilities, construction of the planter median, and surface preparation and overlayment of the existing inside lanes.

The established lane closures for each stage of construction would be maintained during daytime and nighttime hours. It is unlikely that complete detours (i.e., complete closure of all lanes of Aurora Avenue North) would be used during construction because of the high volume of daily traffic and the large impact such a closure would have on businesses.

Alternative B

Alternative B proposes construction of continuous 7-foot-wide sidewalks (adjacent to a 6-inch curb) that extend the length of the project area and seven lanes of traffic (two general-purpose lanes and one continuous BAT lane (same operation as for Alternative A; see discussion on BAT lane in description of Alternative A) northbound and southbound, and one center lane for left/U-turn pockets/ median). A cross section is shown in Figure 2-2. Openings in the raised center median lane would be provided for left turns and/or U-turns at signalized intersections at North 145th Street, North 149th Street, North 152nd Street, North 155th Street, North 160t Street, and North 165th Street. Additional turn pockets would be provided at North 163rd Street for traffic turning westbound and eastbound. Additional openings in the raised median would be provided in left-turn pockets for left turns and/or U-turns at the following locations: southbound at Shurgard Storage Center, northbound at the Quest Inn Motel, southbound at Seattle Restaurant Supply, southbound at Shoreline Family Auto Care, and northbound at the Arden Rehabilitation Center (see Figure 2-4). The raised median would be 15 feet wide, except where there are left/U-turn pockets, where they would be 4 feet wide. In addition, dual left/U-turn lanes would be provided northbound at North 160th Street and eastbound at North 155th Street. A right-turn lane would also be constructed southbound at North 155th Street.

Additional proposed improvements would include constructing curbs and gutters and 7-foot-wide sidewalks along both sides of Aurora Avenue North. Because a 7-foot-wide sidewalk is inconsistent with the City of Shoreline Development Code, a deviation from the code would be applied for if this alternative is constructed. Pedestrian railings will be provided as necessary to protect pedestrians at vertical grade separations, such as along retaining walls. The project includes installation of new traffic signals at North 165th Street, North 152nd Street, and North 149th Street and signal modifications at North 145th Street, North 155th Street, and North 160th Street. Bus shelters would be built at specific locations



CITY OF SHORELINE

Aurora Avenue North Multimodal Corridor Project:
North 145th Street to North 165th Street

Project Area Limits

B Business Access/Transit Lane

Figure 2-4
Alternative B

with widened sidewalks, and roadway lighting would be added throughout the corridor. Special lighting would be provided for pedestrian and transit stop facilities. In addition, overhead utilities would be relocated underground and the stormwater drainage system would be improved.

Construction activities under Alternative B would be the same as those described for Alternative A and would be sequenced to optimize traffic flow and to minimize the impacts of construction.

Permits and Approvals

Permits and approvals that may be required include:

- City of Shoreline Right-of-Way Permit—Necessary for construction activities in the right-of-way
- National Environmental Policy Act (NEPA) Approval—Due to use of federal funds for the project, the Aurora Corridor Project must comply with environmental review process of the NEPA
- National Pollutant Discharge Elimination System (NPDES) Baseline General Permit for Construction Sites—Triggered when a project has a construction area that disturbs more than 5 acres of soil; applicant must prepare Storm Water Site Plan that includes a Temporary Sediment and Erosion Control Plan and verify that SEPA and public notice requirements have been met
- SEPA Approval—Any agency action in the state of Washington that is not categorically exempt from Washington's SEPA is required to undergo comprehensive environmental review
- Endangered Species Act (ESA) Approval—Due to use of federal funds, project must comply with ESA by assessing the impacts to federal threatened and endangered species and their habitat, and mitigating those impacts where necessary
- Section 106 Approval—Due to use of federal funds, project must comply with Section 106 of the National Historic Preservation Act, which mandates any projects with federal involvement (in this case, funding) take into account the effects on historical or archaeological resources; consultation with the State Historic Preservation Officer is required

CHAPTER 3

Affected Environment, Environmental Consequences, and Mitigation Measures

Environmental Elements Not Impacted by Proposed Improvements

Certain resources have not been addressed in this document because they are not located within the boundaries or vicinity of the proposed project, and thus would not be affected by the proposed project. These resources include floodplains, coastal areas, and shorelines, farmland, and Section 4(f)/6(f) lands. Other elements of the environment have not been included because the characteristics of the project preclude measurable impacts. For example, energy has not been addressed because the scale of the project would not lead to measurable changes in energy consumption. Similarly, the project is not located in an area of known geologic hazards and would not require much earthwork during construction. Because the project will not require or lead to the displacement of businesses or residences, relocation has not been addressed in this document.

Availability of Discipline Reports

Discipline reports have been prepared for all of the environmental elements analyzed within this EA/Draft EIS. The discipline reports are incorporated by reference into this document, and are available for review at the following locations:

- FHWA Washington Division office, Olympia, Washington. Contact Elizabeth Healy, Transportation and Environmental Engineer, 711 South Capitol Way, Suite 501, (360) 753-8655.
- WSDOT Northwest Region office, Shoreline, Washington. Contact Ben Brown, 15700 Dayton Avenue North, MS-138, (206) 440-4528.
- City of Shoreline, City Clerk's office, Shoreline, Washington. Contact Joyce Nichols, 17544 Midvale Avenue North, (206) 546-0779.

Methodology

The transportation analysis used industry-accepted and standardized procedures to identify the potential transportation impacts of the project. These include intersection Level-of-Service (LOS) Analysis, traffic diversion, and transit operational performance. Corridor operations and intersection LOS were evaluated using SYNCHRO. Traffic diversion was evaluated using the City's EMME/2 travel demand model. Transit operational factors were evaluated using VISSIM micro simulation traffic simulation software. No major transportation improvement projects beyond those contained in the PSRC 2020 Metropolitan Transportation Plan (MTP) were considered in the forecast (PSRC, 1998). Planned North City improvements to 15th Avenue Northeast between NE 172nd Street and NE 180th Street, as identified in the City of Shoreline's Planned Action Environmental Impact Study, were included in the traffic forecasts. Trip generation for 2020 was based on the adopted *City of Shoreline Comprehensive Plan* land uses, including redevelopment of land in the Aurora corridor. A full description of the methods used is provided in the Transportation Discipline Report.

Affected Environment

Aurora Avenue North is a major north/south arterial that serves both local and regional traffic within the City of Shoreline. Aurora Avenue North is a portion of signed State Route 99 (SR 99) that extends from northern Pierce County to northern Snohomish County. In addition to serving intra-city traffic, the route serves as a regional link between cities in the Puget Sound region. The proposed Aurora Corridor Project extends from the southern City limit at North 145th Street to North 165th Street, a distance of approximately 1 mile. Ultimately, the City plans to improve the entire length of Aurora Avenue North within the City, from the southern City limits at North 145th Street (SR 523) to the northern City limits at North 205th Street, a distance of approximately 3 miles.

Between North 145th Street and North 165th Street, Aurora Avenue North is a five-lane roadway with two general-purpose traffic lanes in each direction and a continuous two-way-left-turn lane in the center. All of the signalized intersections along this portion have striped crosswalks and pedestrian-actuated signals. Curbs, gutters, and sidewalks occur only intermittently and are present along less than 15 percent of this portion, where they have been constructed as part of recent development projects. Existing right-of-way width varies from 90 feet to 130 feet over the length of the project. Much of the existing parking directly adjacent to the roadway is parallel to the roadway shoulders and is angled or perpendicular within the Aurora Avenue North right-of-way. Parking within the right-of-way occurs primarily near retail and commercial land uses within the project area. Several businesses along Aurora Avenue North use the shoulder for parking in areas where there is no curb.

Land use along Aurora Avenue North is predominantly commercial/retail. Most of the businesses are freestanding, with individual driveways or continuous shoulder access. Numerous driveways, limited curbs and sidewalks, and erratic parking all contribute to a

general lack of safe passage for pedestrians, bicyclists, and vehicles. This type of development has resulted in a very high number of individual access points that increase conflict and impact safety along the corridor. In total, there are 63 access points in this 1-mile portion, an average access density of more than 60 driveways per mile (Table 3-1). National Cooperative Highway Research Program (NCHRP) Report 420 indicates that the ideal number of access points per mile is between 20 and 30 for both directions. National statistics indicate that crash rates for access densities of more than 60 per mile can be more than 2.5 times higher than the crash rate for access densities of fewer than 20 per mile.

Table 3-1
Existing Driveway Access Along Aurora Avenue North
(North 145th Street to North 165th Street)

		Driveway Count					
		Northbound		Southbound		Totals	
Street Limits	Driveways per mile	Full Access	Right-In / Right-Out Only	Full Access	Right-In / Right-Out Only	Full Access	Right-In / Right-Out Only
145th to 155th	72	14	2	18	5	32	7
155th to 160th	32	4	2	2	0	6	2
160th to 165th	64	6	3	6	1	12	4
						50	13
Average	**60**				**Total**	**63**	

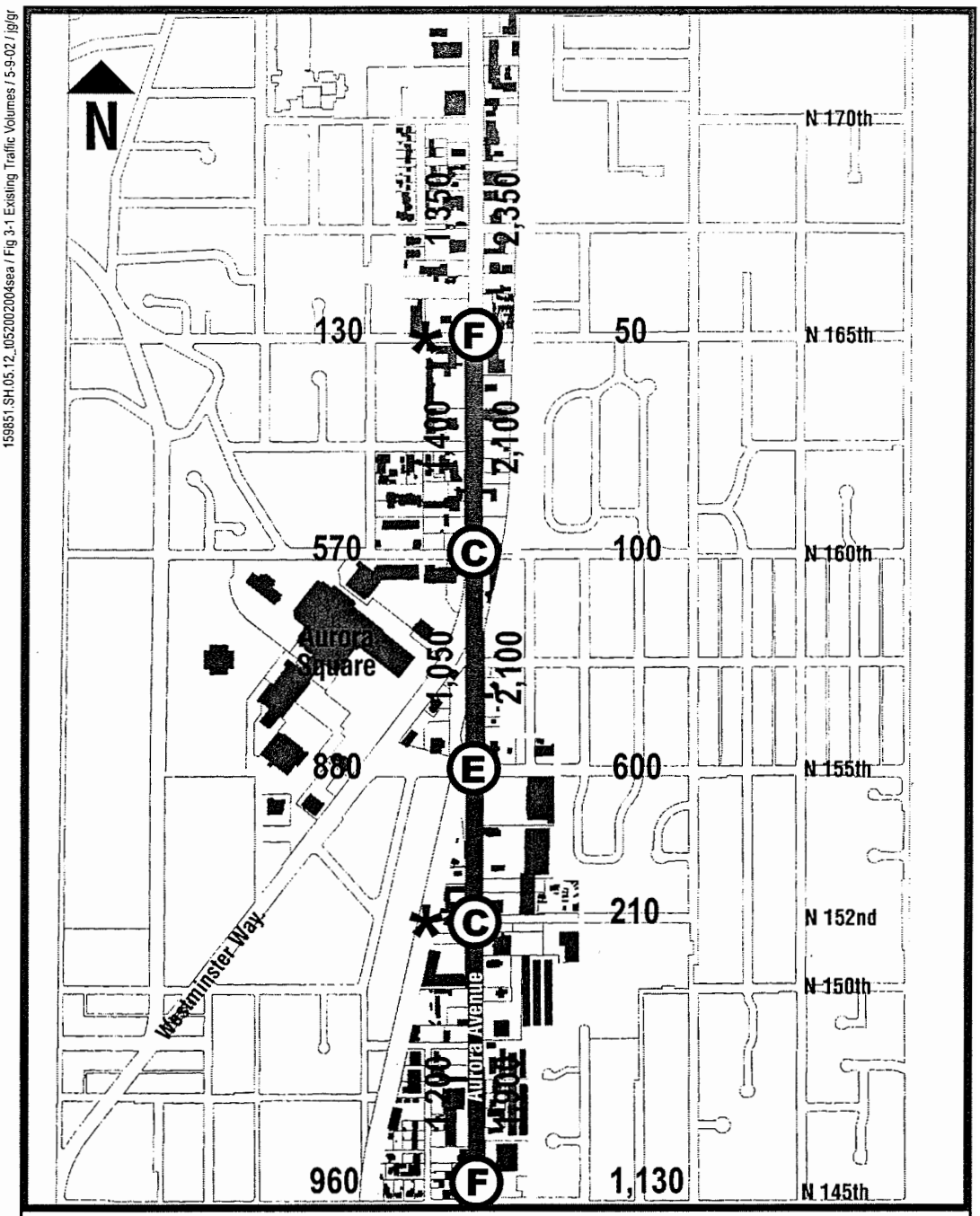
Source: CH2M HILL, 2001

Traffic Volumes

The annual average daily traffic (AADT) volumes along Aurora Avenue North range between 35,000 and 40,000 vehicles per day (vpd). The a.m. peak hour of traffic generally occurs between 7:00 a.m. and 8:00 a.m. Mid-day traffic does not tend to peak sharply, but instead builds steadily toward the p.m. peak hour of traffic, which generally occurs between 4:00 p.m. and 5:00 p.m. in the northbound direction. Existing p.m. peak-hour traffic volumes are provided in Figure 3-1. Due to traffic associated with the Shoreline Community College, the a.m. peak hour of traffic is higher in the northbound direction at the North 160th Street intersection. Unlike the other intersections along this portion, the northbound left-turning movement (northbound to westbound) in the a.m. peak is the heaviest volume experienced at the intersection throughout the course of the day.

Level of Service

LOS is a rating that is assigned to intersections to indicate the overall degree of delay and congestion associated with a roadway or intersection. The general public considers LOS A, LOS B, and LOS C as acceptable operation, and most people will tolerate LOS D operations given expectations of urban conditions. LOS E and LOS F are undesirable and warrant consideration for improvement. LOS definitions are presented in Table 3-2.



LEGEND

(B) Intersection Level of Service

* Asterisk Denotes Unsignalized Intersection — LOS Average for Minor Approaches

CITY OF SHORELINE

Aurora Avenue North Multimodal Corridor Project:
North 145th Street to North 165th Street

Figure 3-1
Existing Traffic Volumes and Intersection Level of Service 2000 PM Peak Hour

Table 3-2
Level of Service Criteria for Signalized Intersections

Level of Service	Average Delay (seconds per vehicle)	Traffic Flow Characteristics
Signalized Intersections		
A	≤ 10	Most vehicles arrive during the green phase and do not stop at all.
B	> 10 to ≤ 20	More vehicles stop, causing higher delay.
C	> 20 to ≤ 35	Vehicle stopping is substantial, but many still pass through the intersection without stopping.
D	> 35 to ≤ 55	Many vehicles stop, and the influence of congestion becomes more noticeable.
E	> 55 to ≤ 80	Very few vehicles pass through without stopping.
F	> 80	Considered unacceptable to most drivers; intersection is not necessarily over capacity even though arrivals exceed capacity of lane groups.
Unsignalized Intersections		
A	≤ 10	Little or no traffic delays.
B	> 10 to ≤ 15	Short traffic delays.
C	> 15 to ≤ 25	Average traffic delays.
D	> 25 to ≤ 35	Long traffic delays.
E	> 35 to ≤ 50	Very long traffic delays.
F	> 50	Queuing on minor approaches and not enough gaps of suitable size to allow safe crossing of major streets. Signalization should be investigated at this point, but warrants must be satisfied before implementation.

Source: Transportation Research Board, 2000

Aurora Avenue North within the City is highly congested during the p.m. peak hour and to a large extent during the a.m. peak hour as well. This is due to the high number of commuter trips made to and from the Seattle central business district during peak hours. The most recent year for which there is complete intersection turning movement data for the intersections within this portion is 2000, and these data were used in this analysis to represent the current year of analysis. Existing LOS for 2000 is presented in Table 3-3. Intersection delay along the corridor averages 44 seconds per intersection.

Crashes and Safety

Crash data for the study corridor were obtained from the Washington State Department of Transportation (WSDOT) for a 2-year period, from January 1999 through December 2000. Based on the crash data (summarized in Table 3-4), WSDOT continues to qualify several portions of Aurora Avenue North as High Accident Locations (HALs). For 2000, WSDOT reported HALs at the intersection of North 165th Street, between North 160th Street and North 163rd Street, at the intersection of North 155th Street, and between North 145th Street and North 155th Street, which covers virtually the entire portion of the project area.

Table 3-3 2000 Existing p.m. Peak Intersection Level of Service Summary		
	p.m.	
Cross Street	LOS	Delay (seconds)
North 145th Street	F	88.7
North 152nd Street	C[1]	30.2
North 155th Street	E	55.5
North 160th Street	C	22.5
North 165th Street	F[1]	> 100

Source: CH2M HILL, 2001
[1]Unsignalized intersection.

Table 3-4 Crash Experience 1/1/1999 to 12/31/2000 (North 145th Street to North 165th Street)				
Total Collisions	Injury Collisions	Fatalities	Injuries	Pedestrians Involved
224	92	1	117	5

Source: WSDOT, 2002

During this period a total of 224 collisions were recorded. Injuries resulted from 92 crashes (41 percent); 1 crash resulted in a fatality. The crash rates along Aurora Avenue North within the City have historically been among the highest in the state for an arterial of its type. WSDOT has calculated that the crashes reported for Aurora Avenue North within the City resulted in losses of nearly $8 million during the 2 years between January 1, 1999, and December 31, 2000. The crash rate for the portion of Aurora Avenue between North 145th Street and North 165th Street was 8.3 crashes per million vehicle miles during this period.

Transit

Aurora Avenue North is a primary transit corridor within the City, and more than 50 percent of the transit trips originating or ending within the City do so along Aurora Avenue North. Transit service has recently been improved to and from downtown Seattle along Aurora Avenue North with increases in service frequency provided along Route 358.

There are two park-and-ride lots located along Aurora Avenue North in the City. The Shoreline Park-and-Ride (400 stalls) is located at the intersection of North 192nd Street and is accessible from Aurora Avenue North and North 192nd Street. The Aurora Village Transit Center and Park-and-Ride (200 stalls) is located one block east of Aurora Avenue North on North 200th Street. It is accessible from North 200th Street and the Aurora Village parking area. A complete list of existing transit service along Aurora Avenue North and a

description of peak and off-peak service frequency is provided in the Transportation Discipline Report.

Transit stops are present approximately every 0.25 mile on both sides of Aurora Avenue North. Two stops, located on the western side of the roadway at North 165th Street and North 160th Street, have shelters.

Pedestrians and Bicyclists

Pedestrian and bicycle activity is sparse along Aurora Avenue North due to the lack of adequate and safe facilities. The City is developing the Interurban Trail along the Seattle City Light transmission right-of-way adjacent to Aurora Avenue North as a pedestrian and bicycle facility. The trail will serve as a connector for regional bicycle trips as well as a trail for recreational walking. Sidewalks will be constructed along the entire length of the corridor as part of the proposed project.

Trucks

Truck traffic currently accounts for 4 to 6 percent of total traffic in the project area. Truck traffic along the corridor is primarily delivery traffic and regional truck traffic. Aurora Avenue North (SR 99) is part of the Washington State Freight and Goods Transportation System, is a tonnage class T-2 facility, and serves as a secondary freight corridor to Interstate 5 (I-5) for regional movement. Westminster Way is a regional freight route that connects SR 99 to Greenwood Avenue and provides access to the Ballard-Interbay manufacturing and industrial center via Holman Road and 15th Avenue Northwest.

Environmental Consequences

The forecast year used to assess environmental consequences was 2020. Existing travel demand models (*City of Shoreline Comprehensive Plan*, City of Shoreline, 1998; PSRC, 1998) were used in addition to historical traffic counts to develop future p.m. peak-hour traffic forecasts for intersection turning movements. Recent traffic counts (1997–2001) were used for comparison to verify that the forecast volumes were reasonable and consistent.

No major regional transportation improvement projects beyond those contained in the PSRC *2020 Metropolitan Transportation Plan* (MTP) were considered in the forecast (PSRC, 1998). Planned North City improvements to 15th Avenue Northeast between NE 172nd Street and NE 180th Street, as identified in the Planned Action Environmental Impact Study, were included in the traffic forecasts. Trip generation for 2020 was based on the adopted *City of Shoreline Comprehensive Plan* land uses, including redevelopment of land along the Aurora corridor.

Snohomish County has been the fastest growing county in the region over the past 10 years. Population and land use are expected to continue to grow over the next 30 years, increasing by 60 to 70 percent over existing levels. Traffic will also increase as a result and place more pressure on Aurora Avenue North to serve trips originating in or destined for Snohomish County.

Because the traffic capacity and roadway geometrics of intersections would be identical for Alternatives A and B, the analysis of intersection LOS is the same for both alternatives.

Alternative A would generate slightly higher U-turn volumes at signalized intersections. Alternative B would generate slightly higher mid-block U-turn volumes.

Aurora Avenue North is an urban street system characterized by heavy traffic volumes, moderate speeds, and the need to balance local access, safety, and regional mobility. Both build alternatives proposed for the Aurora Corridor Project include two general-purpose traffic lanes in each direction and one combined business access and transit (BAT) lane in each direction. This additional transit lane would provide easy access to businesses and improved transit operations. Improvements at major intersections would include adding turn lanes on minor street approaches to provide additional cross-street capacity. Additional signals would be added at key intersections to provide vehicular and pedestrian access across Aurora Avenue North, improve traffic progression, and increase overall traffic safety. All of the intersections are proposed to be fully traffic- and pedestrian-actuated and coordinated through an arterial master controller to minimize delay and optimize vehicular movement along Aurora Avenue North.

Some driveways would be relocated and consolidated to meet Washington State and King County access management standards. Under Alternative A, a channelized left-turn, U-turn, and median would replace the existing two-way left-turn lane. Left-turn and U-turn opportunities would be located to provide access to minor cross streets and to some high-volume consolidated driveway locations. Under Alternative B, turning movements along and across Aurora Avenue North would be focused using a series of medians, c-curb, and other traffic control devices.

By 2020, travel demand along Aurora Avenue North is expected to increase by 1.25 to 1.75 percent per year. Differences in local and regional travel demand between the No Action Alternative and the build alternatives would be negligible—traffic growth will occur whether the project is constructed or not. The anticipated annual increase is equivalent to an approximate increase of 30 percent in traffic over the course of the design study period (20 years). Estimated traffic volumes for 2020 are provided in Figure 3-2.

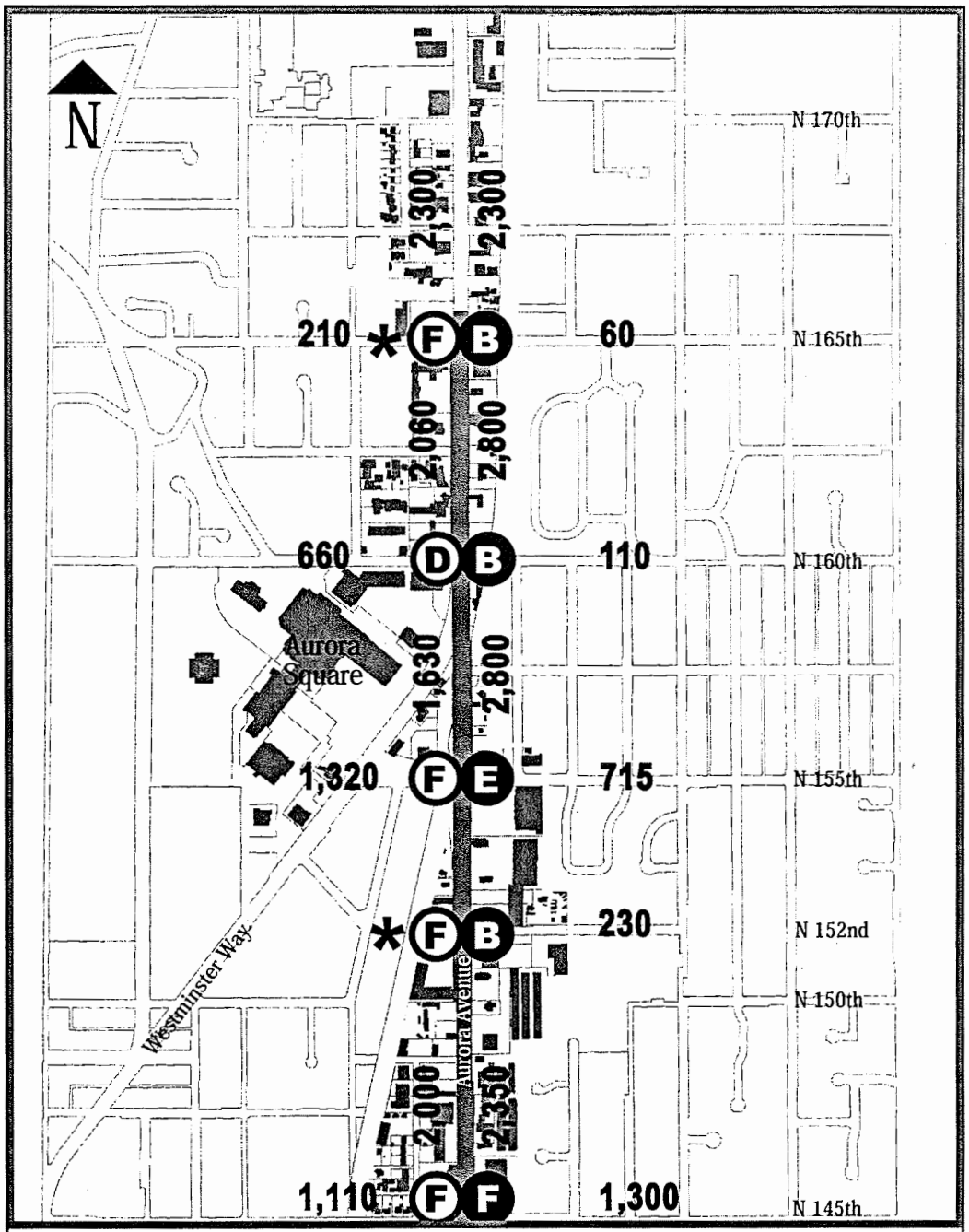
Construction Impacts

No Action Alternative

There would be no construction impacts associated with the No Action Alternative.

Alternative A

Impacts due to construction under Alternative A would not be expected to differ substantially from those under Alternative B. Direct impacts to traffic flow due to construction activity would potentially result from lane closures, detours, and temporary traffic control measures. Revisions to business access typically create temporary disruption of access to businesses because drivers are unfamiliar with the new access conditions. These disruptions to access would tend to be most severe during initial construction, and the effects would decrease over time. Truck and delivery access would also be impacted during construction.



LEGEND

- (B) Intersection Level of Service
- ○ No Action Alternative
- ● Alternatives A and B
- ✱ Asterisk Denotes Unsignalized Intersection — LOS Average for Minor Approaches

CITY OF SHORELINE

Aurora Avenue North Multimodal Corridor Project:
North 145th Street to North 165th Street

Figure 3-2
Future Traffic Volumes and Intersection Level of Service 2020 PM Peak Hour

Alternative B

Alternative B, which would include narrower sidewalk widths than Alternative A, would have a marginally less amount of disturbance of access for sidewalk construction activity.

Operational Impacts

Operational impacts are discussed in terms of street system, traffic volumes, LOS, crashes and safety, pedestrian safety, and transit.

Level of Service

The City, per its comprehensive plan (City of Shoreline, 1998), uses a zonal average LOS measure to determine acceptable intersection operations. For the Aurora corridor, this is represented as a zonal average of LOS E. Using this methodology, LOS for intersections along the Aurora corridor must average LOS E or better to comply with the *City of Shoreline Comprehensive Plan* and its transportation concurrency goals. The No Action Alternative would not satisfy this requirement.

No Action Alternative

Under the No Action Alternative, intersection LOS would continue to deteriorate below acceptable levels as demand exceeds capacity in the corridor. Two of three signalized intersections would operate at LOS F, as would both of the unsignalized intersections. The corridor average would also be at LOS F and, therefore, would not comply with the requirements of the *City of Shoreline Comprehensive Plan*. In addition, the lack of signalization at North 152nd and North 165th Streets would greatly impair access to Aurora Avenue North at these locations, even for right-turning vehicles. Due to the poor service at these intersections, vehicles might take alternate routes through neighborhoods to access signal-controlled intersections.

Alternatives A and B

Operations Under Initial Conditions

The effects of transitions from the new cross section, provided by Alternatives A and B, to the existing cross section along Aurora Avenue North will be treated by the construction of lanes and lane tapers to accommodate the merge of transit and right-turning vehicles at the project termini south of North 145th Street and north of North 165th Street. The general-purpose traffic using the Business Access/Transit (BAT) lane will be required to turn right and exit Aurora Avenue North at driveways to properties and at the intersections. Therefore, the vehicles making the through movement in the BAT lane will be limited to transit vehicles and bus traffic, which can be given priority or special advance timing to facilitate the merge back into general-purpose traffic. This merge action will be of no greater impact than currently occurs in locations where transit vehicles pull onto the shoulder to unload and load passengers and then reenter the traffic lane. Vehicles using the BAT lane to make right turns onto Aurora Avenue North will have some distance in which to merge into the through traffic lane. The development of the new cross sections for Alternatives A and B are not expected to have any adverse traffic impacts on the highway system north or south of this project, nor any adverse impacts on other adjacent roadways.

Operations Under 2020 Conditions

The additional capacity provided by the build alternatives would provide better operating conditions along Aurora Avenue North than would be expected under the No Action Alternative. Intersection delay along the corridor would average less than 50 seconds per intersection, or LOS D, which is within the range of acceptable zonal LOS required by the *City of Shoreline Comprehensive Plan*. Major benefits of the build alternatives would be improved transit speed and reliability as well as the preservation of business access under congested conditions. Delays experienced at minor street approaches along the corridor would also be improved under the build alternatives. Table 3-5 lists the future intersection LOS with and without the project. Future intersection LOS is also illustrated in Figure 3-2, along with forecast peak hour volumes.

Traffic Diversion

The increase in traffic demand throughout the region and within the Aurora Avenue corridor necessitates the construction of additional traffic and pedestrian movement capacity. This additional capacity is needed to serve regional and longer intra-city trips that would potentially divert to parallel, local routes that are not appropriate for traffic other than that that is generated and collected in accessing local residences. Results of the screenline analysis taken between North 155th Street and North 160th Street indicate that traffic on routes parallel to SR 99 would be expected to increase in both the northbound and southbound directions under the No Build Alternative. Under Alternatives A and B, this traffic would be accommodated on Aurora Avenue North. Table 3-6 indicates the potential traffic diverted from Aurora Avenue North under the No Action Alternative.

Table 3-5
2020 Estimated p.m. Peak Intersection Level of Service Summary

	No Action Alternative		Build Alternatives	
Cross Street	**LOS**	**Vehicle Delay (seconds)**	**LOS**	**Vehicle Delay (seconds)**
North 145th Street	F	119	F	129
North 152nd Street[1]	F	> 100	B	12
North 155th Street	F	96	E	71
North 160th Street	D	47	B	49
North 165th Street[1]	F	>100	B	14
Corridor Average[2]	**F**	**87.3**	**D**	**55**

Source: CH2M HILL, 2001

1. Unsignalized Intersection – LOS Average for Minor Approaches

2. Unsignalized intersections not included in No Action corridor average calculation.

Table 3-6
2020 p.m. Peak-Hour Traffic Diversion Comparison:
No Action Alternative versus Alternatives A and B

	Parallel Route									
	Greenwood Avenue North	Dayton Avenue North	Aurora Avenue North	Ashworth Avenue North	Meridian Avenue North	I-5	5th Avenue North	15th Avenue North	25th Avenue North	SR 522
Southbound	(5)	(5)	30	(5)	(10)	0	0	0	0	0
Northbound	(5)	(10)	40	(10)	(5)	0	0	(5)	0	(5)

( ) = Reduction No Action Alternative vs. Alternatives A and B
Source: CH2M HILL, 2001

No Action Alternative

Analysis indicates that without additional capacity along Aurora Avenue to accommodate future traffic growth, traffic volumes along neighborhood streets parallel to Aurora Avenue would increase. Without improvements to major signalized intersections, level of service will continue to degrade below acceptable levels and drivers may divert into neighborhoods to avoid what will become choke points. Two locations where this may be most prevalent is at North 165th Street for southbound vehicles destined for Shoreline Community College via North 160th Street and at North 152nd Street for northbound vehicles destined for eastbound North 155th Street.

Alternatives A and B

A comparison of the City's travel demand model scenarios representing the No Action Alternative and the build alternatives indicates that both Alternative A and B would help reduce the amount of traffic that would divert into neighborhoods. Corridor LOS will be kept at an acceptable level to encourage the use of Aurora Avenue North as the major course of travel.

Crashes and Safety

No Action Alternative

Under the No Action Alternative, crash experience would be expected to worsen. Lack of access controls would lead to crash rates equal to or greater than those under existing conditions. The total number of crashes per year would be higher due to increasing traffic volumes and greater occurrence of unsafe conflicting movements. Under the No Action Alternative, continued land use redevelopment along the corridor would add some sidewalks and defined driveway access points. These changes would improve pedestrian safety, but would do nothing to reduce the number of conflicting vehicular movements. A table summarizing the relative expected safety between the No Action and Build Alternatives in terms of conflict points and control environment is provided in Table 3-7.

Table 3-7
Conflict Point Comparison by Severity and Control Environment

	Conflict Point Totals						Alternatives A and B Reduction Relative to No Action					
	Uncontrolled			Controlled			Uncontrolled			Controlled		
Severity	M	D	C	M	D	C	M	D	C	M	D	C
No Action Alternative	184	186	283	24	10	114	--	--	--	--	--	--
Alternative A	57	69	9	36	15	161	(127)	(117)	(274)	12	5	47
Alternative B	61	72	20	36	16	165	(123)	(114)	(263)	12	6	51

( ) = Reduction
M = Merge; D = Diverge; C = Cross
Source: CH2M HILL, 2001

Alternative A

Alternative A would provide comprehensive access management improvements to Aurora Avenue North that would include addition of curbs and gutters, application of driveway width and spacing standards, conversion of the existing two-way left-turn-lane into a channelized left-turn and U-turn lane and a median, restriction of driveways to right-turn-in and right-turn-out only, and provision of the BAT lanes that would allow traffic to safely enter and exit the roadway. Recent research (Parsonson et al., 1993) indicates that implementing access management can reduce overall crash rates by as much as 26 percent and reduce property-damage-only rates by as much as 40 percent. Based on the level of access management provided under Alternative A and Alternative B, it would be expected that the crash experience would be reduced slightly more under Alternative A than under Alternative B, relative to the No Action Alternative.

Alternative B

Alternative B would include design features that would reduce existing conflicts along the Aurora corridor. Alternative B differs from Alternative A in that Alternative B would provide more openings in the median, which would include additional crossing conflicts along the roadway. Due to these additional conflict points, the risk of crashes under Alternative B would be slightly higher than under Alternative A.

Pedestrian Safety

No Action Alternative

Under the No Action Alternative, Aurora Avenue would continue to be an unsafe and uncomfortable environment for pedestrians due to the lack of sidewalks and the lack of adequate crossing opportunities. Crashes involving pedestrians would increase due to increasing traffic volumes and the potential for conflict with pedestrians.

Alternative A

Pedestrian safety improvements along Aurora Avenue North under Alternative A would include continuous sidewalks; improved pedestrian-scaled lighting throughout the corridor;

and improved pedestrian crossings, including some signalized crossings and median refuge islands at crossings of the full width medians (at North 149th Street, and at North 160th Street). Such elements would reduce pedestrian exposure to conflicts with motor vehicles and might decrease the number of pedestrian-involved crashes along the corridor.

Alternative A would provide 8-foot-wide sidewalks along both sides of the roadway for the entire 1-mile portion. In addition, a 4-foot-wide landscape and amenity zone would be provided as an additional benefit to pedestrian safety and comfort. The 4-foot-wide amenity zone would buffer pedestrians from vehicular traffic and provide an area for the installation of underground utilities, poles, and vaults that might otherwise conflict with the walkway for pedestrians. The amenity zone also would allow the necessary width to accommodate the full driveway apron without affecting the cross-slope or grade of the 8-foot-wide sidewalk. This would provide a more desirable condition for the disabled and mobility challenged and would ensure compliance with the requirements of the Americans with Disabilities Act (ADA).

Design criteria for Alternatives A includes a pedestrian access route (clear of utility grates and covers) of at least 5 feet in width with a maximum cross slope of 1:48 and a maximum ramp grade of 1:12. Overhead protrusions into the right of way will be at a minimum of 80 inches above the pedestrian access route. Under Alternative A, a 4-foot amenity zone would allow vehicular driveway ramps to be provided prior to the driveway/sidewalk intersection. This will enable that the sidewalk be constructed on a continuous grade equal to that of the adjacent roadway.

Pedestrian actuators will be installed at accessible heights and the City may also install pedestrian detectors (currently deployed at North 175th Street) at signalized crossings. Accessible interfaces to abutting properties will be included as part of frontage reconstruction where right-of way encroachment as a result of the project occurs.

Alternative B

Alternative B would provide 7-foot-wide sidewalks along both sides of the roadway for the entire 1-mile portion. The sidewalk area must also accommodate driveway aprons, luminaire and sign poles, and utility vaults. Alternative B would require a design that could accommodate driveway aprons and other features while maintaining a minimum 5-foot width of passage and keeping the sidewalks within the acceptable limits of cross slope and grade of 2 percent and 5 percent, respectively. Therefore, more wheelchair-accessible ramps would be required along the sidewalks at each driveway to satisfy provisions required by the Americans with Disabilities Act (ADA). ADA facilities in Alternative B would be designed to the same specifications as in Alternative A.

Transit

No Action Alternative

Under the No Action Alternative transit speed and reliability would deteriorate as traffic congestion continues to increase because transit vehicles would be required to share lanes with general-purpose vehicles. At locations where transit vehicles pull out of the traffic lanes to serve transit stops, reentry into the traffic lanes would involve more delay because there would be fewer adequate gaps in the traffic flow available.

Alternatives A and B

Under Alternatives A and B, continuous BAT lanes would be developed in both directions throughout the corridor. These lanes would be shared with traffic entering and exiting the roadway and accessing driveways and cross streets. In addition, enhanced bus zones and bus shelters would be created and transit signal priorities would be established. Enhancing transit features along Aurora Avenue North would encourage more transit use by commuters and each bus trip could potentially mean that there would be 30 to 35 fewer vehicles on the road, reducing traffic congestion. A continuous sidewalk system along the corridor would also make it safer and more convenient to access transit stops.

Transit speed and reliability would be expected to improve over existing conditions, and, as a result, transit would attract more riders. Transit arrivals along the corridor would not be expected to deviate from the route schedules under Alternatives A and B as they would under the No Action Alternative. Schedule reliability could improve between 1 and 1.5 minutes per run. This is mainly due to the fact that buses would stop inline (in the BAT lane) for passengers to board and alight rather than be required to pull out of the travel lane onto the shoulder and wait for a sufficient gap in traffic to return. Based on these improvements, transit under the build alternatives would be expected to achieve a much higher mode share of trips along the corridor, especially during peak periods. An additional benefit of improved transit service efficiency is the ability of transit providers to provide more trips for the number of service hours. This would allow higher trip frequencies and, therefore, more transit capacity and overall person capacity in the corridor without additional operating costs.

Truck and Emergency Vehicle Access

No Action Alternative

While access across Aurora Avenue North would not change under the No Action Alternative, the increased volumes along Aurora Avenue North would effectively block access across the roadway for much of the day because there would be fewer gaps in the uncontrolled traffic flow to allow for safe movement in and out of driveways.

Alternatives A and B

The medians included under Alternatives A and B would affect routing and access to properties along Aurora Avenue North. Trucks accessing Aurora Avenue North from regional points would be able to position for right-in/right-out access by using the I-5 interchange at North 175th Street to access properties on the western side and the I-5 interchange at North 145th Street to access properties on the eastern side of the roadway.

Also, Westminster Way provides an alternate truck route that enables trucks to position for right-in/right-out access. Most commercial properties along Aurora Avenue North can be accessed using driveways to sites within 300 feet along cross streets.

Access to properties will be maintained by locating the median openings at major truck access points. These openings will make it possible for trucks and emergency vehicles to make left turns into properties along the corridor. The openings will be designed to accommodate a WB-55 design vehicle, which is typically the largest type of vehicle that uses major arterials. Improvements to intersections will also facilitate access for delivery vehicles

to commercial properties, frontage streets, and alleys. The City will monitor neighborhood streets for inappropriate truck traffic and take measures to discourage such action.

Secondary and Cumulative Impacts

Secondary impacts associated with the Aurora Corridor Project relate mainly to the potential for the project to spur land use changes outlined in the *City of Shoreline Comprehensive Plan*. The additional traffic capacity, safety, access, and aesthetic improvements along Aurora Avenue North to be provided by the build alternatives might make Aurora Avenue North a more attractive business and/or residential location, stimulating land use changes that are planned to be higher density, more transit-oriented, and mixed use.

The increase in land use intensity, enabled or accelerated by the Aurora Corridor Project, would generate additional travel demand. The land uses potentially affected by the project were planned as part of the *City of Shoreline Comprehensive Plan* process and were part of the base assumption in developing the traffic forecasts. Because both the land use and the resulting traffic increase are anticipated, the proposed build alternatives were designed to accommodate the increased demand and activity. The design of the build alternatives—by adding traffic capacity, nonmotorized amenities, and transit facilities—includes mitigation of secondary impacts and will help future development attain transportation concurrency.

Cumulative impacts involve the City's plans for the improvement of Aurora Avenue North from the southern city limits at North 145th Street (SR 523) to the northern city limits at North 205th Street (SR 104), a distance of approximately 3 miles. The section that will not be constructed as part of this project comprises a distance of approximately 2 miles. As in the project area, the portion from North 165th Street to North 205th Street is a five-lane roadway with two general-purpose traffic lanes in each direction and a continuous two-way, left-turn lane in the center.

The cumulative impact analysis considers this project and the 2-mile length of Aurora Avenue North from North 165th Street to North 205th Street using the cross section adopted as the preferred alternative by the Shoreline City Council on August 23, 1999. In addition, the analysis assumes completion of the Interurban Trail for the entire planned extent (North 145th Street to North 205th Street).

Currently, the entire length of Aurora Avenue North within the City is highly congested during the p.m. peak hour and to a large extent during the a.m. peak hour as well. This is due to the high number of commuter trips made to and from the Seattle central business district during peak hours. The existing intersection LOS for 2000 is presented in Table 3-8. Intersection delays along the corridor currently average more than 44 seconds per intersection. One of the intersections, North 160th Street, currently experiences a lower LOS during the a.m. peak hour due to a large number of vehicles accessing Shoreline Community College and large employers west of Aurora Avenue North.

The crash rates along Aurora Avenue North within the City (from North 145th Street to North 205th Street) are among the highest in the state for an arterial of its type and are similar to those reported for the North 145th Street to North 165th Street project.

As in the proposed project, transit stops occur approximately every 1/4 mile north of North 165th Street. Additional shelters are located near North 192nd Street at the Shoreline Park-and-Ride.

Future traffic conditions along the entire portion were evaluated to assess the cumulative impacts. Analysis for the proposed project assumes the build-out of the remaining length of Aurora Avenue North within the City to the cross section adopted by the Shoreline City Council on August 23, 1999. As such, traffic operations analysis for the proposed project inherently includes cumulative impacts.

Table 3-8
2000 Existing p.m. Peak Intersection Level of Service Summary

	p.m.	
Cross Street	**LOS**	**Delay (seconds)**
North 145th Street	F	82.7
North 152nd Street[1]	C	30.2
North 155th Street	D	45.3
North 160th Street	C	20.3
North 165th Street[1]	F	> 100
North 175th Street	D	47.5
North 185th Street	D	38.7
North 192nd Street	A	8.1
North 200th Street	C	30.5
North 205th Street	D	39.7

Source: CH2M HILL, 2000
1. Unsignalized Intersection – LOS Average for Minor Approaches

Cumulative Operational Impacts

Operational benefits (relative to the No Action Alternative) would also be similar in scale to those provided by the proposed project. The Interurban Trail project would be expected to slightly reduce traffic volumes along Aurora Avenue North because some drivers might decide to bicycle rather than drive.

Average intersection LOS for the corridor would be consistent with the Comprehensive Plan standard of LOS E.

In addition to improving the intersection LOS, the build alternatives would accommodate future traffic growth that might otherwise divert to parallel neighborhood streets. This includes the effects of additional lanes at North 175th and North 185th Streets, which provide critical access to I-5 and Richmond Beach and are important east-west links for the City (see Table 3-9).

To ensure that traffic diversion to neighborhood streets does not occur, the City will monitor traffic volumes to determine if traffic has increased substantially as a result of the project. If

diversion does occur, traffic control measures will be taken to discourage cut-through traffic.

Cumulative Safety Impacts

The Aurora Avenue North and Interurban Trail projects would improve safety along the corridor. Both Aurora projects would provide access management improvements to Aurora Avenue North that include the addition of curbs, gutters, and sidewalks; the application of driveway width and spacing standards; conversion of the existing center two-way, left-turn lane into a channelized left-turn and U-turn lane, and pedestrian refuge areas at crossings of full width medians; restriction of the majority of driveways to right-turn-in and right-turn-out only; and provision of the BAT lanes that would allow traffic to safely enter and exit the roadway. Recent research (Parsonson et al., 1993) indicates that implementing access management and pedestrian-scale street lighting can reduce overall crash rates by as much as 26 percent. Reductions in property-damage-only rates have been found to be as much as 40 percent.

The Interurban Trail project would provide a separated facility for bicyclists and pedestrians who currently must travel the corridor along the roadway without separation from vehicles. This would reduce the risk of vehicle/pedestrian crashes. If pedestrian and bicycle activity increases, as expected from the Interurban Trail project, the number of pedestrians and bicycles crossing at a number of locations along the corridor would increase.

Table 3-9
2020 Estimated p.m. Peak Intersection Level of Service Summary

	No Action		With Project	
Cross Street	**LOS**	**Delay (seconds)**	**LOS**	**Delay (seconds)**
North 145th Street	F	119	F	129
North 152nd Street[1]	F	> 100	B	12
North 155th Street	F	96	E	71
North 160th Street	D	47	D	49
North 165th Street[1]	F	> 100	B	14
North 175th Street	F	106	E	69
North 182nd Street[1]	F	> 100	A	12
North 185th Street	F	98	E	66
North 192nd Street	B	13	B	10
North 195th Street[1]	F	> 100	B	10
North 200th Street	F	86	E	70
North 205th Street	F	80	E	64
Corridor Average[2]	**F**	**81**	**D**	**45**

Source: CH2M HILL, 2001
[1] Unsignalized Intersection – LOS Average for Minor Approaches
[2] Unsignalized intersections not included in No Action corridor average calculation.

Cumulative Nonmotorized Impacts

Both the Aurora Corridor Project and the Interurban Trail project would add substantial nonmotorized facilities to the Aurora corridor. The additional crossing locations provided by the projects would form connections for trail users and other pedestrians and bicyclists across this high-volume principal arterial. Under current conditions, Aurora Avenue lacks a signalized crossing opportunity for pedestrians between North 160th and North 170th Streets, a distance of more than 3/4 mile.

Redevelopment of the Interurban Trail Special Study Area between North 175th Street and North 185th Street is proposed as part of future improvements along the Aurora corridor, from North 165th Street to North 205th Street. Several alternatives are under consideration, all of which would include completion of the Interurban Trail between these two streets. This area would likely be designed with accommodations specifically for nonmotorized users and would create an additional destination for nonmotorized users, possibly increasing nonmotorized activity in the corridor.

Cumulative Transit Impacts

Transit would increase all along Aurora Avenue North as a result of the Aurora projects. Continuous BAT lanes would be developed in each direction throughout the corridor. These lanes would be shared with traffic entering the roadway and accessing driveways and cross streets. In addition, enhanced bus zones and bus shelters would be created and transit signal priorities would be established. Enhancing transit features along Aurora Avenue North would encourage more transit use by commuters and each bus trip could remove 30 to 35 vehicles from the road, reducing traffic congestion. A continuous sidewalk system in the corridor would make it safer and more convenient to access transit stops.

Transit speed and reliability would be expected to improve over existing conditions; as a result, transit would attract more riders. Under either build alternative, transit would achieve a much higher mode share of trips along the corridor, especially during peak periods.

Enhanced bus shelters, transit lanes, and transit signal priority are among the improvements proposed in both projects along the Aurora corridor (i.e., from North 145th Street to North 165th Street and from North 165th Street to North 205th Street). Transit feature enhancements, along with improvements in transit speed and reliability, would be expected to result in higher transit use by commuters. A continuous sidewalk system in the corridor would make it more convenient to access transit stops.

The proposed Interurban Trail would provide alternative enhanced routes for pedestrians and bicyclists accessing transit along the Aurora corridor. When combined with the improvements described above, access to the transit system would be greatly improved.

Cumulative Local Access Impacts

The two projects combined (Aurora Corridor Project and future improvements (North 165th Street to North 205th Street), and the Interurban Trail) would provide improved access to businesses along the corridor. Local access to properties adjacent to Aurora Avenue North would be revised to improve safety in the corridor in both Aurora projects. U-turns and median breaks would be provided to varying degrees under the two build alternatives.

Local access to businesses and residences by pedestrians and bicyclists would be enhanced by the proposed Interurban Trail. Access points would be created at trail intersections with the street network. In addition, several access points have been designed so that trail users could reach the street network or businesses from the middle of the trail.

Mitigation Measures

Construction Impacts

Impacts related to the build alternatives would be mitigated to the greatest extent possible through the application of construction best management practices (BMPs), including traffic control plans, construction staging plans, and continual communication and coordination with businesses along the corridor. City residents would be advised to use alternate routes during periods of closure and regional transit service would be used to provide additional person-movement capacity at these times. The City has prepared a right-of-way policies and procedures manual that will address construction-related issues and define how they are to be handled throughout the duration of the project.

Planning adequate traffic control during design and construction of this project are key to a smooth, successful, and safe construction. In addition to providing safety to workers, motorists, and pedestrians, the traffic control plan must provide access to the work area as well as full access to the businesses adjacent to the project. Continued public information and opportunities for input would be provided throughout the period of construction. In addition, partnerships with adjacent businesses would be maintained throughout the construction period to ensure that business access needs are met during construction. All transportation modes—pedestrians, bicycles, transit, trucks, and passenger vehicles–will be accommodated.

Transit

Coordination with King County Metro and Community Transit would be ongoing throughout the construction period to minimize impacts to transit service. Bus zone relocation or closure would be clearly signed and communicated to transit riders. Temporary stops would be provided in a safe and accessible location, free of conflicts from other traffic and construction activity.

Bicycles and Pedestrians

The needs of bicyclists and pedestrians within the construction zones must be considered, and the range of needs of pedestrians is wide, including those of the elderly and those with sensory impairments. The following would be considered when developing a traffic control plan for road construction:

- Bicyclists and pedestrians must not be placed into conflict with work site activities because it impedes the work and increases the risk to pedestrian safety.
- Bicyclists and pedestrians must not be put into conflicts with other traffic moving through or around the work area.

- Bicyclists and pedestrians must be provided with a safe and convenient travel way (temporary sidewalk or bike path) that replicates as nearly as possible the qualities of a sidewalk, bikeway, or multipurpose trail.
- Construction flaggers may be provided to facilitate the safe movement of pedestrians and bicyclists through the work zone.
- Provide well-marked detour routes for bicycles and pedestrians that enable direct and safe access to destinations.

Traffic Control Plan

Traffic control plans (TCPs) help ensure a safe and efficient construction operation. Preparation of formal TCPs for the construction of Aurora Avenue North would ensure that adequate traffic control is provided during the construction phases and would help ensure that access through the construction zone and to businesses would be safe.

Construction Staging Plan

The primary options for construction staging are shift, detour, and half-width construction. Shift or half-width construction options are usually the preferred methods of construction because they allow business access during construction, and minimize the spread of construction impacts throughout the community. The shift option maintains the existing lane configuration of the roadway to maximize roadway capacity and driver comfort during construction. It is possible only when sufficient right-of-way is available. Half-width construction staging is another option that maintains some service along the roadway during construction. With this option, all of the roadway traffic is placed on one half of the roadway while the other half is under construction. The number of traffic lanes is reduced, and business access is more difficult to provide.

Construction detours might be needed if major structural repair of the roadway or extensive underground utility relocation is required. Such detours would usually be considered only if the following conditions apply:

- There is only moderate and tolerable impact on the local economy and services.
- The route under construction is other than a high-volume route and detour length is less than 10 miles.
- No major controversy is generated by the detour. This includes adverse impacts to neighborhoods.
- Substantial environmental impacts and right-of-way clearance problems are anticipated.
- The cost of maintaining the designated detour route is less than the cost of the half-width construction option.

When detours and lane closures are needed on high-volume multilane highways, they are generally scheduled to occur during the non-peak daytime and nighttime hours when traffic volumes are at their lowest levels.

Detour routes, when used will be well signed using only appropriate arterial routes.

Choosing the sequence of construction requires tradeoffs between competing goals of construction. These include minimizing the length of construction, keeping traffic flowing, maximizing access to properties, and ensuring proper pavement construction.

Maintaining Access and Communication

During the course of construction, access to businesses along Aurora Avenue North would be maintained. Temporary access revisions would be well marked and would provide the most direct access to properties possible.

Signing during construction can be divided into two categories, those that are required to identify the worksite and its related conditions and hazards and those that identify business locations and access points that might be obscured during construction.

Owner/tenants along the corridor will be kept informed of construction schedules, schedule changes, and information detailing construction activities.

This section addresses potential impacts to land use as they relate to the proposed transportation improvements to Aurora Avenue North. Accessibility is the key to understanding the link between transportation and land use. When a transportation project makes it easier to access certain locations, these places can become attractive to more or different types of development. Land use can also change because travelers alter their timing or behavior in response to changes in the transportation network. Travelers can adjust the timing, route, or mode of travel as well as change the location of where they live, work, or shop.

Methodology

This land use analysis examines the effect of the proposed Aurora Corridor Project build alternatives and the No Action Alternative based on three major considerations:

- Direct and indirect impacts on the changes in land use that are caused by the action
- Cumulative impacts of each alternative and other planned projects on the reasonably foreseeable changes in land use
- Consistency of the proposed alternatives with adopted regional and local land use plans and policies

Direct impacts involve the physical acquisition of land for a proposed alternative, specifically land not already designated for transportation purposes. Only the portions of parcels that would be needed for the proposed improvements were included in the direct impact totals for each alternative. Indirect impacts are changes in the existing land use pattern that are caused by the action that could occur as a result of the proposed alternatives.

The criteria used to determine the magnitude of impacts on land uses include the degree of proposed land use change and the extent to which the proposed new land use (in this case, new right-of-way) is compatible with existing zoning and community character. All alternatives were evaluated to determine if the proposed improvements were compatible with the policies of the *City of Shoreline Comprehensive Plan*. Alternatives were evaluated by the degree to which they fulfilled or were in conflict with these policies.

The following documents were consulted to determine existing land uses, land use designations, and related land use plans for Aurora Avenue North:

- Aurora Corridor Photo Inventory (City of Shoreline, 2000)
- *City of Shoreline Comprehensive Plan* (City of Shoreline, 1998)
- Shoreline Comprehensive Plan and Zoning Map (City of Shoreline, 2001)
- VISION 2020 (PSRC, 1995)
- Destination 2030 (PSRC, 2001)
- King County Countywide Planning Policies (King County, 2000)

The criteria used to determine substantial land use impacts were based on the context and magnitude of the impact in relation to state and regional plans and the existing and planned land uses for the corridor, as defined by the *City of Shoreline Comprehensive Plan* (City of Shoreline, November 1998). Direct land use impacts were considered substantial if the amount of land acquired by the alternative would represent a substantial percentage of loss of a particular land use type in the City.

Affected Environment

Highway 99 was the major north-south route on the West Coast before the advent of the Interstate highway system. As a main travel route, as well as a primary local commercial corridor, Highway 99 was where early strip development occurred, including motor courts, motels, restaurants, drive-ins, and small retail establishments. Remnants of these early highway and strip developments remain. Today, Aurora Avenue North in the City is lined with common commercial strip development, most of which was built under King County zoning regulations before the City was incorporated in 1995.

The project area is defined as 1/4 mile from either side of Aurora Avenue North from North 145th Street to North 165th Street. The project area is characterized by a variety of moderate-density urban land uses, including commercial/retail and office uses. There is a preponderance of automobile-related businesses: automobile sales, rentals, repairs, and service stations. Residential uses abut the side of the commercial development that faces away from Aurora Avenue North.

Most of the properties along Aurora Avenue North are developed with freestanding buildings surrounded by asphalt parking lots.

The project area is located near the Highland Terrace, Westminster, Parkwood, and Meridian Park neighborhoods. Neighborhoods west of Aurora Avenue North (Highland Terrace and Westminster) tend to have newer homes built since 1960. Neighborhoods east of Aurora Avenue North (Parkwood and Meridian Park) contain a nearly even mix of newer homes built after 1960 and older homes built before 1960. This area has moderate housing prices (Shoreline, 1997).

Housing price trends in the City have mimicked the pattern of those in the City of Seattle and King County, although at a more gradual rate. In the mid-1990s, housing prices increased nearly 9 percent annually due to a strong economy in the Puget Sound region (City of Shoreline, 1998). Throughout the late 1990s housing values increased steadily, but at a slower pace as the housing market began to cool. Recently, there has been a slow decrease in housing prices, similar to what has occurred in the Puget Sound region overall. Despite this decrease, housing at all price ranges are available for purchase on the market, and turnover occurs at a reasonable rate of approximately 30 days. Median housing prices generally fall in the mid-$200,000's (Jorgensen, pers. comm., 2001).

Environmental Consequences

Construction Impacts

This analysis identifies temporary impacts during construction of the proposed improvements. It is assumed that these impacts would end after project construction is completed.

No construction would occur under the No Action Alternative; therefore, there would be no construction impacts.

Temporary direct impacts from construction of either Alternative A or B would include noise, dust, traffic congestion, and reduced accessibility to properties. Noise and dust impacts would occur primarily to adjacent commercial development. Temporary traffic congestion would occur along Aurora Avenue North. Reduced access to commercial businesses along Aurora Avenue North could occur during construction.

Both build alternatives would require landform grading and filling; however, no sensitive areas would be impacted nor buildings demolished.

Additional direct land use impacts would occur during construction of Alternatives A and B. Under Alternative A, approximately 1.08 acre of temporary construction easements would be acquired to provide additional access for construction activities. Under Alternative B, approximately 0.81 acre of temporary construction easements would be acquired for construction activities.

All of the temporary land use impacts would be to commercial business land uses.

Operational Impacts

This analysis considers the potential of the proposed project to directly affect the quality of land uses in the project area. The most direct changes in land use would be from the property acquisitions necessary to widen and improve Aurora Avenue North under Alternatives A and B.

No Action Alternative

Under the No Action Alternative, Aurora Avenue North and adjacent land uses would remain in their current use. No direct or indirect land use impacts would occur, no land would be acquired, and there would be no additional pressures for land use patterns to change. Commercial land would continue to be the dominant land use adjacent to Aurora Avenue North, with residential housing nestled farther back from the corridor. Land available for residential construction would remain as depicted in the City's Comprehensive Plan and Zoning Code. The character of the housing would experience deterioration and improvement of the stock normally associated with the life cycle of neighborhoods. The local traffic congestion and crash potential would increase. No pedestrian or landscaping improvements would occur other than those initiated by private property redevelopment, and the corridor would continue to experience poor pedestrian and transit access.

Alternative A

Under Alternative A, approximately 0.79 acre of new property would be acquired to accommodate new roadway surfaces, shoulder areas, sidewalks, planting strips, and cut-and-fill slopes. See the Land Use Discipline Report for a parcel by parcel list of permanent easement required.

Commercial business property would be directly impacted by the acquisition of portions of parking areas, driveways, and existing business landscaping along Aurora Avenue North. Some residential property along North 145th Street (0.05 acre) would also be acquired for right-of-way. No buildings would be demolished; however, the proposed sidewalks and landscaping would be directly adjacent or in close proximity to several existing commercial buildings, resulting in a zero setback, as required by the City's development code. Any signs hanging from the adjacent buildings will be adjusted to provide for an 8-foot vertical clearance over sidewalks, as recommended by the Americans with Disabilities Act.

Of the 2,004 total parking spaces within the project area, Alternative A would impact an estimated 103 parking spaces. Of the total impacted parking spaces, 76 are non-compliant parking spaces and 27 are compliant spaces. A non-compliant parking space is defined as a parking space located within the roadway right of way, or a space that requires backing onto Aurora Avenue for ingress or egress. The loss of compliant parking stalls represents approximately 1.3 percent of the total parking in the project area. While businesses rely on the use of non-compliant parking spaces for overflow parking and display purposes, the City is not required to mitigate the loss of non-compliant spaces. There is enough space available on the impacted parcels to reconfigure the parking areas so that the impacts of the lost parking on the affected businesses would not be substantial. (Refer to the Economics Discipline Report for greater detail on parking impacts.)

In addition, Alternative A would not substantially alter the current residential land use patterns in the City. While improved transportation access in the City might increase pressure for rezoning to higher density residential (and commercial) uses close to the Aurora corridor, these impacts would be regulated by the City's Comprehensive Plan and development regulations. There are no planned zoning or Comprehensive Plan designation changes associated with this alternative that would influence housing development on Aurora Avenue North. Alternative A would not require the demolition of any existing housing units, nor would it require acquisition of land that is planned for housing.

The probable impacts of Alternative A improvements on property values depend on a number of variables and are difficult to predict. In the context of this Environmental Impact Statement/Environmental Assessment (EIS/EA), it is not possible to quantify potential impacts on property values in advance. In some situations, anticipated negative impacts of traffic and noise and decreased feelings of neighborhood livability might affect residents' subjective attitudes; however, it is not certain that these impacts will affect property values. There might be countervailing factors that would offset negative impacts. For example, while residential property values might decrease near Aurora Avenue North, they might increase in other parts of the City as a result of Alternative A. Overall, it is likely that market forces (supply and demand) would exert a greater influence on changes in property values near Aurora Avenue North than would project area conditions under Alternative A.

Although the magnitude of Alternative A's effects on property values is difficult to estimate, it appears that the proposed improvements to Aurora Avenue North could produce both positive and negative impacts on residential properties. In general, factors that would tend to decrease residential property values (and potentially the sale prices of real property) near Aurora Avenue North include localized increases in traffic noise and physical acquisition of portions of individual properties for right-of-way. However, noise levels under Alternative A would not be greater than under the No Action Alternative, and transportation modeling indicates that there would be no cut-through traffic in nearby neighborhoods. Furthermore, no residential properties would be used or physically converted for transportation purposes. Property valuation would also consider the potentially positive effects of any road improvements on transportation access, freeway access, and on other public services and facilities. Improved mobility and decreased delay for the residential properties near Aurora Avenue North would tend to increase property values.

Alternative B

Direct land use impacts under Alternative B would be similar to those impacts under Alternative A. However, Alternative B would have a narrower road right-of-way, and would therefore require less property (0.47 acre) than Alternative A for new roadway improvements. (See the Land Use Discipline Report for a parcel by parcel list of permanent easement required.) Land uses similar to those under Alternative A would be acquired for the new road right-of-way. No buildings would be demolished; however, the proposed sidewalks and landscaping would be directly adjacent or in close proximity to several existing commercial buildings, resulting in a zero setback, as required by the City's development code. Any signs hanging from the adjacent buildings will be adjusted to provide for an 8-foot vertical clearance over sidewalks, as recommended by the Americans with Disabilities Act.

Of the 2,004 total parking spaces within the project area, Alternative B would impact an estimated 81 parking spaces. Of the total impacted parking spaces, 61 are non-compliant parking spaces and 20 are compliant spaces. A non-compliant parking space is defined as a parking space located within the roadway right-of-way or a space that requires backing onto Aurora Avenue North for ingress or egress. The loss of compliant parking stalls represents approximately 1.0 percent of the total parking in the project area. While businesses rely on the use of non-compliant parking spaces for overflow parking and display purposes, the City is not required to mitigate the loss of non-compliant spaces. There is enough space available on the impacted parcels to reconfigure the parking areas so that the impacts of the lost parking on the affected businesses would not be substantial. (Refer to the Economics Discipline Report for greater detail on parking impacts.)

Impacts of Alternative B improvements to residential housing land use would not be substantially different from those described for Alternative A. No housing units would be acquired and the project would not prevent any planned housing developments from being constructed. Land use patterns would be predominantly directed by the City's Comprehensive Plan and Zoning Code.

Secondary and Cumulative Impacts

The proposed improvements under Alternatives A and B would provide additional mobility and decreased delays through the project area and would provide a more attractive commercial center than the existing commercial land uses. This is a stated goal of the *City of Shoreline Comprehensive Plan* (City of Shoreline, November 1998) and the Aurora Corridor Project.

When taken independently, projects might affect the environment in only minor ways. However, a combination of projects might create more substantial environmental impacts than one project would individually. Consequently, it is important to understand how impacts from one project might supplement or increase impacts that have occurred or might occur from other actions.

No indirect land use impacts caused by Alternative A would occur. Alternative A would be beneficial to adjacent land uses because it would enhance commercial development along Aurora Avenue North by providing greater vehicular and transit mobility and pedestrian access. Adding a low-volume traffic and Business Access/Transit (BAT) lane would improve access to businesses and properties along Aurora Avenue North and improve transit access. This would include adding bus shelters. Pedestrian safety and access would be improved by adding sidewalks, landscaping, and pedestrian lighting. Aesthetics would be improved along Aurora Avenue North by providing landscaping. Collectively, these improvements would make the corridor more attractive for business and retail activity and would be consistent with and facilitate the existing commercial business land use. No changes to land use growth patterns would be expected, although a potential change from one type of commercial land use (automobile-oriented strip commercial) to another type of commercial land use might occur.

No indirect land use impacts caused by Alternative B would occur. Alternative B would be beneficial because it would enhance commercial development along Aurora Avenue North by improving vehicular and transit mobility and pedestrian access, similar to those under Alternative A. However, Alternative B would not include a landscaping amenity zone, which would make it less aesthetically pleasing than Alternative A (refer to the Visual Quality Discipline Report). The proposed improvements under Alternative B would still make the corridor more attractive than under current conditions for business and retail activity and would facilitate and be consistent with the existing commercial business land use. No changes to land use growth patterns would be expected, although a potential change from one type of commercial land use (automobile-oriented strip commercial) to another type of commercial land use might occur.

The Interurban Trail project, Aurora Avenue North improvements from North 165th Street to North 205th Street, and the Pedestrian Safety Demonstration project at North 165th Street and North 170th Street on Aurora Avenue North are included in this cumulative impacts analysis. In addition, the City will prepare a sub-area plan that is intended to influence land use in the corridor, but that process has not yet progressed far enough to analyze its effects.

The cumulative effects of these projects would result in approximately 4.88 acres of direct land use impacts along the Aurora corridor (Table 3-10). The land would be acquired for new right-of-way and improvements associated with improvements along Aurora Avenue North northward from North 145th Street to North 205th Street and the Interurban Trail

northward from North 175th Street to North 188th Street. Because the remaining portions of the Interurban Trail and the Pedestrian Safety Demonstration Project would be located within existing right-of-way, no additional direct land use impacts to private land would be expected. Commercial land uses would be most directly impacted by acquiring approximately 3.31 acres of commercial properties. In addition, approximately 25 commercial businesses could be displaced along Aurora Avenue North, all to the north of North 165th Street.

Table 3-10
Approximate Cumulative Direct Land Use Impacts
Area Acquired for New Road or Trail Right-of-Way

Land Use Type	Square Feet	Acres
Commercial	144,246	3.31
Industrial	27,520	0.63
Residential	14,651	0.34
Vacant	21,570	0.50
Other	4,438	0.10
Total	**212,425**	**4.88**

Although land and businesses would be acquired along the corridor, it is likely that the direct land use impacts would not be substantial. The property acquired would be adjacent to Aurora Avenue North and would likely represent only a small percentage (less than 1 percent) loss of commercial, industrial, residential, and vacant land within the City. Leftover land is expected to be sufficient in size for redevelopment purposes. The cumulative effects of these projects would also include additional pedestrian access to commercial land uses, which would enhance the existing and future business and retail activity and potential redevelopment along the corridor, in accordance with policies of the *City of Shoreline Comprehensive Plan*.

Relationship to Plans and Policies

This section discusses the relationship of the proposed project to relevant existing land use plans, policies, implementation strategies, and development regulations.

City of Shoreline Comprehensive Plan

The City adopted the Comprehensive Plan on November 23, 1998. The plan includes goals and policies specific to the Aurora corridor that redirect the changes in the corridor from a commercial strip to distinct centers with variety, activity, and interest. The plan seeks to balance vehicular, transit, and pedestrian needs, create a "sense of place" and improve the corridor's image, protect neighborhoods, and encourage businesses to thrive. Many other policies within the plan that are not specific to the Aurora corridor are similar in nature.

Land Use Element of Shoreline Comprehensive Plan

The Land Use element includes policies to improve the City's image on the Aurora corridor as a safe place for business and retail activity. Alternatives A and B would provide additional vehicular, transit, and pedestrian access to businesses along Aurora Avenue North, as well as pedestrian and roadway lighting. Both alternatives would provide sidewalks along the corridor, pedestrian lighting, and landscaping; however, Alternative A would provide more landscaping than Alternative B. Collectively, these improvements would improve the aesthetics of the corridor and would make the corridor more attractive for business and retail activity. The No Action Alternative would not be consistent with this policy because no corridor improvements (other than general street maintenance) would occur.

Transportation Element of Shoreline Comprehensive Plan

T17: Pursue methods to improve and enhance transit operations on Aurora in Shoreline. Ensure that Aurora continues to function as a primary transit corridor and provide frequent headways and express service to downtown Seattle.

The Transportation Element includes policies to develop and enhance other transportation modes along the Aurora corridor, such as improving transit, connecting the community via sidewalks and landscaping, incorporating bicycle-friendly designs, and improving automobile and pedestrian signalization to improve safety. Both Alternatives A and B would be consistent with these policies; however, Alternative A would provide a slightly wider sidewalk than Alternative B, and Alternative A would include a landscaped amenity zone, whereas Alternative B would not. The No Action Alternative would not be consistent with any of the transportation policies.

Capital Facilities Element of Shoreline Comprehensive Plan

The Capital Facilities Element includes a policy to enhance infrastructure that will be economically beneficial by creating adequate capacity to move people and goods. The purpose of this project is to provide multimodal transportation services and support economic stability along Aurora Avenue North. Therefore, the proposed improvements under Alternatives A and B would provide added vehicular and transit mobility and pedestrian access to commercial businesses along Aurora Avenue North in the project area. In addition, sidewalks, lighting, and landscaping improvements would attract greater business and retail activity. Other infrastructure improvements included under Alternatives A and B include stormwater improvements and moving existing utilities underground. The No Action Alternative would not be consistent with this policy because no infrastructure improvements (other than general street maintenance) would be provided.

Community Design Element of Shoreline Comprehensive Plan

The Community Design Element includes policies to enhance the attractiveness of the Aurora corridor through wide sidewalks, pedestrian amenities, landscaping, and connecting the community. Both Alternatives A and B would provide these community improvements; however, Alternative B would provide a slightly more narrow sidewalk and less landscaping than Alternative A. The No Action Alternative would not be consistent with these policies because no community improvements would be provided.

Mitigation Measures

The Transportation Chapter provides a discussion of temporary traffic control measures that should be implemented to minimize traffic congestion and maintain access to existing businesses during construction. The Noise and Air Quality Chapters provide discussions of the best management practices that could be used to help reduce noise and dust from construction activities.

The City would comply with all applicable permits and approvals to begin construction of the proposed project.

Property acquired for new right-of-way would be purchased by the City at fair market value in accordance with the *Aurora Avenue North Right-of-Way Policies and Procedures Manual* and in accordance with "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended."

Methodology

Information about all social elements associated with the Aurora Corridor Project was gathered from the City documents and project design reports. Information was supplemented and verified through site visits and conversations with various City and service provider staff. Footprints of the build alternatives, traffic volume projections, and input from service providers were used to determine the potential impacts.

The primary source of demographic data for this discipline report is the 2000 U.S. Census. Income data were also obtained from the 1990 U.S. Census because income information from the 2000 U.S. Census is not yet available. Additional demographic data were obtained from various City documents.

The study area for the recreation and services sub-elements extends roughly from North 145th Street to North 175th Street and from Meridian Avenue North to Dayton Avenue North. Information on utilities and pedestrian and bicyclist facilities is more specific to Aurora Avenue North itself. The study area for regional and community growth is the City boundaries.

The environmental justice analysis was prepared in compliance with the following documents:

- Presidential Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (EO 12898) dated February 11, 1994
- U.S. Department of Transportation, Order on Environmental Justice (DOT Order 5610.2) dated April 15, 1997
- Federal Highway Administration, Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (FHWA Order 6640.23) dated December 2, 1998

The purpose of this section is to determine if any substantial impacts would occur as a result of the proposed alternatives. The required magnitude of effect for an impact to be considered substantial is described below for each subsection.

- Recreation—Planned or existing recreational facilities are acquired or could no longer be accessed or used, or proximity impacts (e.g., noise and/or visual) cause the enjoyment of the facility to be substantially and irreparably impaired.
- Services—Access to public services is lost or interrupted for a duration of time that substantially jeopardizes safety.
- Pedestrian and Bicyclist Facilities—Facilities are acquired or their use is affected to the point where safety is substantially compromised.

Affected Environment

Recreation

There are three parks and a proposed regional bicycle and pedestrian trail (Interurban Trail) near the Aurora Corridor Project area (see Figure 3-3).

Darnell Park is approximately 0.80 acres and is currently undeveloped. It is located adjacent to the existing Seattle City Light right-of-way, just south of North 165th Street. Darnell Park could be improved as depicted in the design report for the Interurban Trail. The land adjacent to the park is completely developed (except for the existing utility right-of-way) with residential properties. The park is not accessible by vehicle.

The proposed **Shoreline Interurban Trail** would extend from the Snohomish County line (North 205th Street) to the City of Seattle boundary (North 145th Street) and would lie mostly within the Seattle City Light utility right-of-way within the project area. The proposed trail begins west of Aurora Avenue North at North 145th Street, travels north and crosses Aurora Avenue North at North 155th Street, travels east to Midvale Avenue North, and eventually rejoins the Seattle City Light right-of-way traveling north. The proposed trail would touch down onto Aurora Avenue North at North 155th Street on the east side of the raised embankment and enter the transportation facility of the roadway shoulder and normal sidewalks and then crosswalks to cross the streets to the east or north.

The primary use of the corridor is for electrical power distribution, and maintenance workers use the corridor for access to the distribution facilities. Access by foot to the corridor is available at North 155th Street by a narrow steep path on the west side of the raised embankment to the sidewalk below. Private vehicles are prohibited and are blocked by ecology blocks and gates that serve as barriers.

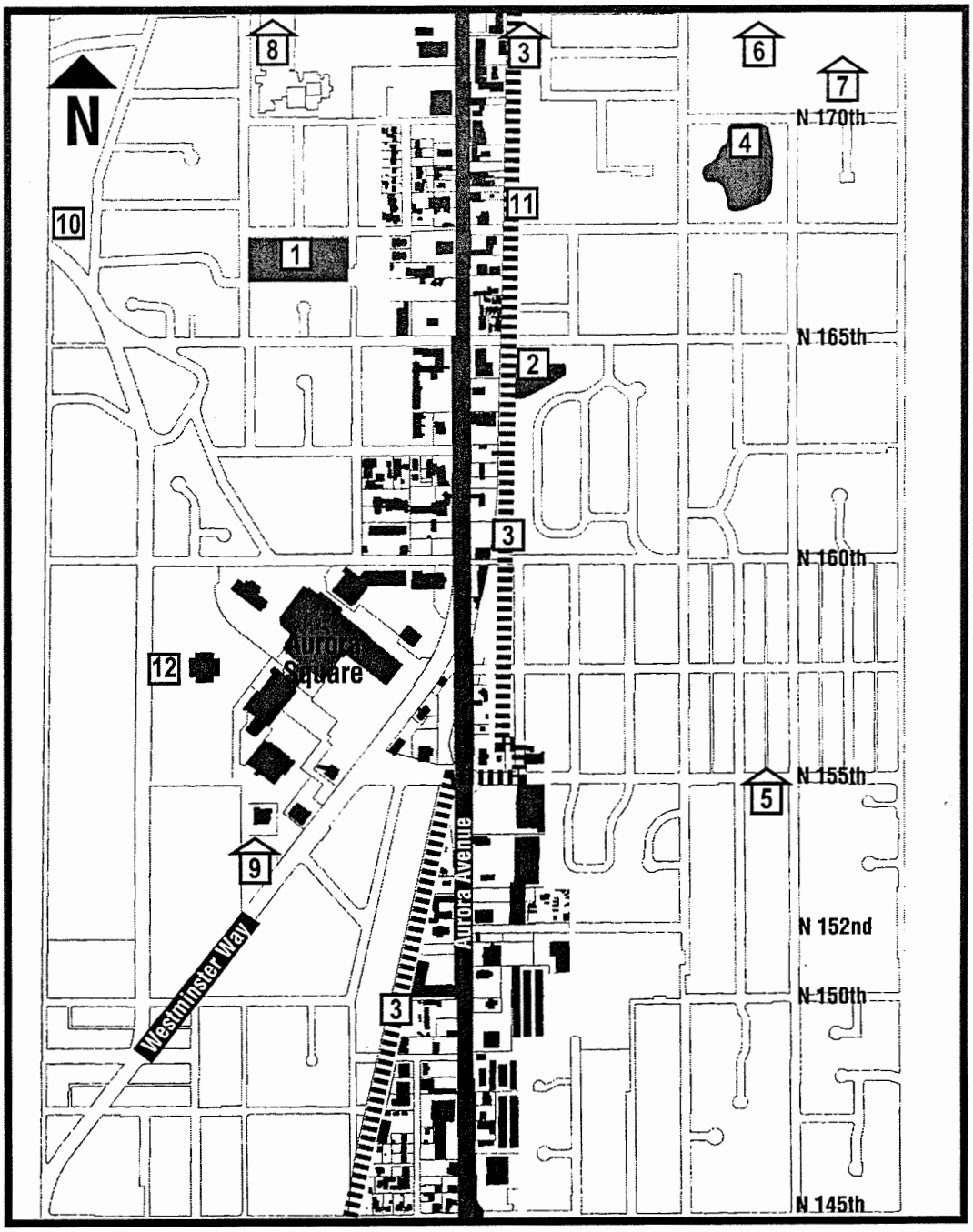
Richmond Highlands Park and Community Center is approximately 3.80 acres and is located west of Aurora Avenue North between North 166th Street and North 167th Street. Facilities at Richmond Highlands Park include two youth baseball/softball fields, a soccer field, a playground area, a community center, and parking.

Meridian Park is approximately 3.20 acres and is located east of Aurora Avenue North and south of North 170th Street. Most of Meridian Park is currently undeveloped because of steep hillsides and wetland considerations.

In addition to the parks there are schools in the vicinity of Aurora Avenue North that contribute to the recreation resources of the City of Shoreline community. Amenities include baseball and softball fields, soccer fields, playground areas, and paved courts.

Regional and Community Growth

The City's population in 2000 was 53,025, an increase of 6,000 residents (over the population of the Shoreline Census Designated Place [City of Shoreline incorporated in 1995]) since 1990 and 10,000 residents since 1980 (U.S. Census, 2000). Most of this population growth was due to annexations; however, the population growth in the area that currently makes up the City (i.e., including the areas annexed) was from 51,839 to 53,025. Historically, the Shoreline area has alternated between periods of population growth and periods of slight population decline. It is expected that demand for new housing in the City will continue to



LEGEND

1. Richmond Highlands Park
2. Darnell Park
3. Interurban Trail (proposed)
4. Meridian Park
5. Parkwood Elementary School
6. Meridian Park Elementary School
7. Shoreline Children's Center
8. Shorewood High School
9. NW School for the Hearing Impaired
10. Herzel Memorial Park
11. Seattle Sephardic Brotherhood Cemetery
12. Washington State Department of Transportation

CITY OF SHORELINE

Aurora Avenue North Multimodal Corridor Project:
North 145th Street to North 165th Street

Figure 3-3
Location of Public Facilities

expand, primarily because the City is an attractive community with good schools and it provides convenient access to many job centers in King and Snohomish Counties (Shoreline, 1998).

During the past 10 years, the City has become more racially diverse. In 1990 the City had a minority population of 12 percent; this increased to 22 percent in 2000 (U.S. Census, 2000). In that same time span, the median age in the City increased steadily from 36 in 1990 to 39 in 2000. Correspondingly, the percent of the City's population older than 65 has increased from 13 percent in 1990 to 14.5 percent in 2000. This increase in the age of residents is comparable to the general King County trend, which is associated with the aging of the baby boomer population (Shoreline, 1996).

In 1997, the estimated median household incomes in the City and in King County were $62,098 and $57,282, respectively. From 1995 to 1997, the median household income for the City and King County increased at an average annual rate of 5.5 percent (PSRC, 1995, 1996, 1997).

Services

There are several schools located near the project area (see Figure 3-3):

- Parkwood Elementary School at 1815 North 155th Street
- Meridian Park Elementary School at 17077 Meridian Avenue North
- Shorewood High School at 17300 Fremont Avenue North
- Northwest School for the Hearing Impaired at 15303 Westminster Way

Children who live south of North 160th Street and east of Aurora Avenue North attend Parkwood Elementary School, those who live north of North 160th Street and east of Aurora Avenue North attend Meridian Park Elementary School, and those who live west of Aurora Avenue North attend Highland Terrace Elementary School (location not shown in Figure 3-4). All students who live west of I-5 attend Shorewood High School. Also near the project area is the Shoreline Children's Center at 1900 North 170th Street, which provides year-round daycare, preschool, and extended-day program for grades kindergarten through six, and a summer program for children aged 2-1/2 to 12 (www.shorelin.wednet.edu, 2001).

There are two cemeteries near the proposed project area. Herzel Memorial Park is a small cemetery located west of Aurora Avenue North on Dayton Avenue between North 166th Street and North 170th Street. The Seattle Sephardic Brotherhood Cemetery is located east of Aurora Avenue North on North 167th Street.

The Shoreline Fire Department (District #44) serves an area slightly larger than the incorporated boundaries of the City. Two fire stations are near the project area: the headquarters building at 1016 North 175th Street, and a neighborhood station at 145 North 155th Street. Fire department personnel in 2000 included 72 uniformed staff and 15 uniformed reserves, plus other support staff and elected officials (Shoreline Fire Department, 2001).

There are no hospitals within the City limits. The fire department performs emergency assistance services as well as response to fire calls. Two private ambulance companies serve the area, American Medical Rescue and Shannon Ambulance (Shoreline, 1998).

The City has contracted with the King County Sheriff's Office (KCSO) since 1995 for a full-service police department. The officers work exclusively for the City, wear City uniforms, and drive City-marked patrol cars. Police headquarters is located at 1206 North 185th Street. Forty-three commissioned officers work exclusively for the City. There are no municipal jail cells located within the City (King County, 2001).

Existing electrical lines and facilities are operated and maintained by Seattle City Light. Overhead utilities run along Aurora Avenue North on 40-foot timber poles, which are generally spaced every 120 to 180 feet. Most utility poles are on the western side of Aurora Avenue North, but there are some on the eastern side in the southern portion of the project area. The Shoreline distribution substation at North 165th Street and Meridian Avenue North is the principal station serving the City.

Puget Sound Energy provides natural gas service to the residents near Aurora Avenue North. The gas lines are located underground along the corridor on the western side of Aurora Avenue North until the 15000 block. North of the 15000 block the gas line is located on the eastern side of Aurora Avenue North.

Both Verizon and Qwest Communications provide telephone services to the City. Qwest Communications provides telephone service from North 145th Street to North 160th Street; Verizon provides service from North 160th Street to the northern City limit. Overhead telephone lines are located primarily on the eastern side of Aurora Avenue North south of Westminster Way and on the western side of Aurora Avenue North north of Westminster Way.

AT&T Broadband is the cable television and Internet service provider for Shoreline. Overhead lines occur on the western side of Aurora Avenue North from the 14500 block to the 14900 block, and on the eastern side of Aurora Avenue North from the 15000 block to the 15500 block. Fiber-optic cable is buried in the middle of Aurora Avenue North along the entire length of the corridor. The cable is owned by Global Crossing and serves as a trans-global communication line.

Water service in the project area is provided by Seattle Public Utilities (SPU), which also provides sewer service along Aurora Avenue North from the southern project limits north to North 153rd Street. Ronald Wastewater District provides sewer service north of North 153rd Street. In 2002, Ronald Wastewater District will serve the entire Shoreline area. Water mains are located on both sides of Aurora Avenue North at various points north and south along the corridor. North of Westminster Way, sewer lines are located on both sides of Aurora Avenue North.

The Shoreline Public Works Department maintains the City's storm drainage system, which is composed primarily of storm drains (pipes) and catchbasins. There are no existing stormwater detention or quality treatment facilities for runoff from the roadway. The storm drainage system not only conveys the runoff from the existing roadway and sidewalks, but also conveys stormwater runoff from many areas adjacent to the roadway. A few of these adjacent areas have onsite storm drainage systems with stormwater detention and/or

quality treatment facilities that discharge via a pipe connected to the roadway drainage system (CH2M HILL, 2001).

Waste Management Northwest provides waste collection, disposal service, and recycling service to residents and commercial customers in the area. Solid waste collected by Waste Management Northwest is disposed of by the King County Solid Waste Division, with transfer and disposal to the Cedar Hill Landfill. Collection vehicles operate along Aurora Avenue North and surrounding streets at varying times during the week (Shoreline, 1998).

The Washington State Department of Transportation (WSDOT) has a 5-acre site west of the Aurora Square shopping center at 15700 Dayton Avenue North.

Pedestrian and Bicyclist Facilities

Currently, Aurora Avenue North in the City functions almost exclusively as a route for automobiles. There are no formal bicycle lanes along this stretch of the roadway. Sidewalks occur only intermittently and are generally associated with newer development along the corridor; thus, in many areas, pedestrians must use asphalt shoulders and parking lots as pathways. Numerous driveways, informal protruding parking stalls, and the absence of a curb contribute to the lack of safe passage for pedestrians. Bicyclists traveling on Aurora Avenue North generally use the shoulder area for travel, and are subject to the same types of hazards as pedestrians.

Environmental Consequences

Construction Impacts

Recreation

There would be no construction impacts associated with the No Action Alternative.

Impacts of construction activities for both of the build alternatives would include the following:

- Dust would be emitted during earthmoving activities by construction vehicles and equipment, from areas within the construction zone that have been disturbed, and where excavated material would be stockpiled.
- There would be additional intermittent noise. Noise sources would include construction vehicles and equipment, construction workers' vehicles, and material delivery vehicles.
- Temporary increased traffic congestion that might hamper access to parks.

Additional noise and dust from construction would be noticeable from the Interurban Trail at the North 155th Street crossing. This at-grade crossing might need to be closed or relocated for a short time during paving and other construction activities. If it is closed, trail users could use the existing transportation system to continue northward. The City will maintain a crossing for the trail so that its use is not precluded. Construction noise and dust impacts to other parts of the Interurban Trail would be minor because the trail would exist in a relatively noisy urbanized area, the trail would be farther away from the construction area, and any additional impacts would be short term.

Darnell Park, because it is removed from the actual roadway, would experience noise and dust impacts similar to those of the Interurban Trail.

No other recreational facilities would be impacted by construction activities.

Regional and Community Growth

There would be no construction impacts associated with the No Action Alternative.

Construction activities associated with both Alternative A and Alternative B would have no impacts on regional and community growth.

Services

There would be no construction impacts associated with the No Action Alternative.

Construction activities for Alternatives A and B might have an impact on fire service by increasing response times if service providers are not notified of construction activities that involve lane closures or detours. During construction, emergency vehicles would avoid Aurora Avenue North and use alternate routes (Mehlert, pers. comm., 2001). Police response times would not be affected because patrol cars are dispersed throughout the City and do not depend on any single route to respond to a call (Orndorf, pers. comm., 2001).

Generally, for all utilities, localized service areas could be affected on an intermittent basis during the construction period. The existing underground pipelines in the project area would require protection from potential compression during the pre-load operations.

Access to all nearby public services might be hampered by construction traffic; however, none of these facilities are completely dependent on Aurora Avenue North for access.

No other public services would be affected.

Pedestrian and Bicyclist Facilities

There would be no construction impacts associated with the No Action Alternative.

Constructing Alternatives A or B would require alternately closing each side of the road during construction, forcing pedestrians and bicyclists to detour around the construction activities, most likely to the opposite side of the road. Noise and dust from construction activities would affect conditions for pedestrians and bicyclists traveling along Aurora Avenue North. These would be temporary impacts that would end after construction.

Operational Impacts

Recreation

No Action Alternative

There would be no impacts to recreational facilities under the No Action Alternative.

Alternative A

Alternative A would not preclude the use of, nor acquire land from, any proposed or existing recreational facility that qualifies as a Section 4(f) property. Seattle City Light is the owner of the land where the future Interurban Trail is proposed by the City of Shoreline between North 145th Street and North 155th Street. The Interurban Tail is a "licensed use"

in the utility transmission right-of-way agreed to in a Memorandum of Understanding (MOU). The MOU between the City and Seattle City Light was effective on August 9, 2001.

There would be no impacts from this alternative that would necessitate the preparation of a Section 4(f) Evaluation. There would be no acquisition of land from the future Interurban Trail for this project nor would this project cause any substantial impairment to the operation of the future Interurban Trail.

Alternative A would incorporate landscape and urban design elements including a median refuge that would highlight the roadway and increase the safety of the corridor for pedestrians and bicyclists. This would provide pedestrians a safer means for crossing Aurora Avenue North, particularly at the Interurban Trail crossing, thereby improving their access to parks and recreational facilities.

The capacity and integrity of Darnell Park would be unaffected by this alternative because the park does not sit directly adjacent to the roadway. Access could be improved to a limited degree due to the nearby pedestrian and bicyclist improvements on North 165th Street.

No other parks or recreational space at nearby schools would be affected.

Alternative B

Alternative B would not require the acquisition of recreational facility land or preclude the use of any existing or proposed recreational facility.

Alternative B would not provide the same level of landscape and urban design amenities as Alternative A; however, sidewalks would be implemented along the length of the corridor and would improve access to the Interurban Trail. The addition of specially marked paving at the North 155th Street intersection would improve the crossing environment for Interurban Trail users.

Alternative B would affect Darnell Park in the same manner as Alternative A.

No other parks or recreational space at nearby schools would be affected.

Regional and Community Growth

No Action Alternative

Regional and community growth patterns would continue to fluctuate due to public policy and regional and national demographic trends. Population change within the City would be the result of changes in the amount of housing and the local and regional economy, among other factors.

Alternative A

Alternative A would have no direct effect on population growth or demographic growth patterns. Travel patterns in neighborhoods would be expected to decrease because more efficient movement on Aurora Avenue North would reduce the incentive for motorists to use neighborhood streets for shortcuts. No additional developable residential or commercial land would be created and there would be no displacements.

Alternative B

Alternative B would have no direct effects on population growth or growth patterns, similar to Alternative A.

Services

No Action Alternative

Under the No Action Alternative, congestion would gradually increase, which could hinder the provision of public services because of increased travel times along the congested corridor. The number of crashes in the project area would also be expected to gradually increase because of increased congestion, increasing the need for emergency service.

Alternative A

Alternative A would have no impact on local schools, cemeteries, solid waste service, or other government facilities; access to these facilities and services would be improved through improved traffic flow. The presence of a median might make some travel slightly more circuitous, but would not substantially affect service provision.

Alternative A would have positive and negative impacts to fire and emergency response times in the project area. Traffic flow improvements on main service route streets would improve response times. Conversely, the landscaped median might increase response times to some locations by forcing emergency vehicles to use the left-turn breaks instead of turning directly into properties. The presence of the median would require the fire department to use more than one vehicle to lay out fire hoses across the street, adding to the complexity of the task. While these issues would add to the department's response time, neither one would be considered substantial (Mehlert, 2001).

Police response times would be unaffected by Alternative A because squad cars do not depend on set routes to reach their destination. Therefore, the median on Aurora Avenue North would not negatively affect the provision of this service (Orndorf, 2001).

Existing underground utilities within the project limits would be field located and surveyed to develop a base map that shows the location of underground utilities and potential conflicts. As part of Alternative A, all overhead utilities would be undergrounded into a joint trench that would extend under the sidewalk amenity zone planter strip. Overhead service drops to commercial properties would be converted to underground services, and, in some cases, the undergrounding would continue all the way to the buildings. Lids to the underground vaults could be placed in the amenity zone. The utility companies would pay for the service undergrounding up to the right-of-way, at which point the service undergrounding cost would be the responsibility of the property owner. These conversions would be negotiated with the property owners. Final underground plans would be prepared by the utility companies and would be included in the contract documents. The contractor would be responsible for the proposed undergrounding of the utilities.

The *King County Surface Water Design Manual* requires redevelopment projects to provide stormwater quality treatment measures for the runoff from all pollution-generating surfaces within the project limits. The project would include construction of stormwater quality treatment facilities to treat the runoff from all of the road surfaces in the project area. Please see the Surface Water/Water Quality section of this EIS for more information regarding stormwater impacts.

Alternative B

Operational impacts to services under Alternative B would be similar to those discussed above for Alternative A.

Under Alternative B, there would be more median breaks than under Alternative A, which would allow fire and emergency vehicles to make more left turns along the corridor. In this respect, the impact to emergency response times would be incrementally smaller than that under Alternative A, but this would be a minor impact (Mehlert, 2001). Additional right-of-way might be needed in some areas to accommodate the full width of underground utility vaults. Lids to the vaults would be located in the sidewalk. These lids are typically metal and can become slippery or icy in the winter.

Pedestrian and Bicyclist Facilities

No Action Alternative

Under the No Action Alternative, unsafe conditions for pedestrians and bicyclists would continue due to substandard facilities and increasing traffic volumes. Sidewalks would be installed only as a result of private redevelopment.

Alternative A

Under Alternative A, pedestrian safety and capacity would be substantially improved and the environment for pedestrians would be enhanced with the addition of 8-foot-wide sidewalks, specially marked pedestrian crossings at intersections, and lighting. A 4-foot-wide amenity zone would contain landscaping, lighting, and compatible underground utilities, and would provide a buffer between pedestrians and the roadway.

No formal bicycle lanes would be included as a part of Alternative A; however, bicyclists might use the BAT lane or ride on the sidewalk. The competing uses of the facilities (transit and vehicles in the BAT lane, and pedestrians on the sidewalk) might discourage bicyclists from using these facilities. Bicyclists would be encouraged to use the Interurban Trail for cross-town use.

Alternative B

Under Alternative B pedestrian safety and capacity would be improved over existing conditions by construction of continuous 7-foot-wide sidewalks. Alternative B would not provide an amenity zone to buffer pedestrians from the roadway or lighting to improve pedestrian safety.

Conditions for bicyclists would be the same as those under Alternative A.

Secondary and Cumulative Impacts

Recreation

There were no secondary impacts identified that would be caused by the project improvements.

Two other projects in the vicinity of the project have the potential to affect recreational facilities: the Interurban Trail and future improvements along Aurora Avenue North from North 165th Street to North 205th Street. Cumulatively, all three projects have the ability to increase mobility in the vicinity of nearby recreational facilities and have the potential to

increase the number of pedestrians present along the Aurora corridor, which in turn could increase use of nearby parks. Each project together would form a network of sidewalks and trails stretching the entire length of Shoreline that would improve the ability of pedestrians and bicyclists to reach nearby recreational facilities.

Following project implementation, there could be additional redevelopment along Aurora Avenue North that would attract more people; this could result in an increase in use of nearby facilities. Additionally, open space and other pedestrian-friendly recreational uses could be included as a part of potential redevelopment, which could increase the number of recreational opportunities in the corridor.

Regional and Community Growth

Alternatives A and B would not directly cause development, but might serve as a mechanism to enable it by improving traffic flow and increasing the number of transportation modes that could be feasibly and safely used to access the corridor. However, the alternatives would not induce or cause population growth; population growth is caused by estimated future population increases, which are determined and directed by the Puget Sound Regional Council under the GMA and the *City of Shoreline Comprehensive Plan* and the City's Zoning Plan, which underwent a complete environmental review. The demand to relocate within or near the corridor could increase if the economic climate were perceived favorably by the public. Alternative A might be perceived as providing a more attractive business environment, in compliance with the *City of Shoreline Comprehensive Plan*. These types of effects are considered and have been analyzed in the environmental documents for the City's Comprehensive Plan; growth rates would not be expected to substantially exceed the estimates presented in the plan.

Cumulative impacts on growth could occur due to the construction and operation of the Interurban Trail and the future improvements from North 165th Street to North 205th Street. Redevelopment throughout the entire length of the corridor could strengthen the unifying image of Aurora Avenue North and attract new residents who decide to reside near commercial areas. However, because all of these projects have been anticipated in the City's Comprehensive Plan, their potential effects on growth have been accounted for in the plan's population estimates.

Services

No secondary impacts would occur.

Cumulative impacts to services would arise primarily from the combination of this project with the future improvements from North 165th Street to North 205th Street. The Interurban Trail would not contribute cumulative impacts to schools, cemeteries, or utilities. As a new facility, the Interurban Trail might generate emergency response calls; however, this new demand is estimated to be minimal.

The cumulative impact of these projects would be similar to the direct impacts that would occur from North 145th Street to North 165th Street. There would be no impacts to schools, cemeteries, solid waste service, or government facilities. Traffic flow along the 3-mile stretch of Aurora Avenue North within the City limits would be improved, aiding response times for both police and emergency services. However, based on the preliminary median design,

access to some properties for emergency vehicles would be slightly less direct, thus increasing emergency response times. Police response times would be unaffected. Utilities would be placed underground throughout the corridor and proposed lighting would not be expected to place an undue burden on the electrical system.

All projects would, at a minimum, be designed to attain the stormwater guidelines contained in the *King County Surface Water Design Manual*, resulting in improved water quality conditions in each of the affected basins. Please see the Surface Water/Water Quality Discipline Report for more information regarding stormwater impacts.

Pedestrian and Bicyclist Facilities

Secondary impacts to pedestrian and bicyclist facilities would be similar to those of recreational facilities. Air and noise impacts from higher traffic volumes (under both build alternatives) would have a small additional impact on pedestrians and bicyclists.

Cumulatively, the Aurora Corridor Project, future improvements from North 165th Street to North 205th Street, and the Interurban Trail project would improve the environment for pedestrians and bicyclists throughout the length of Aurora Avenue North. There would be an increase in the number of pedestrians and bicyclists in the vicinity of all three projects due to the improved environment. Pedestrians and bicyclists would have a greater choice of routes to use for local and regional movement. Sidewalks constructed along the full length of Aurora Avenue North would provide pedestrians and bicyclists better and safer access to adjacent businesses. Additionally, the Shoreline Pedestrian Safety Demonstration project would contribute to and enhance pedestrian and bicycle safety because it would provide crossing points within the project area in addition to those provided by the build alternatives.

Environmental Justice

The purpose of this analysis is to report whether high and adverse human health or environmental effects of the proposed project are likely to fall disproportionately on minority or low-income populations. This analysis focuses on the populations that are located within the areas potentially affected by the proposed alternatives. It examines where any expected high and adverse impacts fall relative to minority and low-income populations. For purposes of this analysis, substantial adverse impacts (as reported in the various sections of the EIS/EA) are considered synonymous with high and adverse impacts as described in EO 12898, DOT Order 5610.2, and FHWA Order 6640.23.

To make a finding that a proposed project is inconsistent with the Environmental Justice policy, two situations must occur at the same time: (1) there must be a minority or low-income population and (2) that population must receive a disproportionately high and adverse environmental or human health impact. As reported in the various sections of this EA/EIS, no substantial adverse impacts are expected as a result of either of the build alternatives or the No Action Alternative. Consequently, none of the impacts of the proposed project can be described as having a high and adverse impact in the context of EO 12898, DOT Order 5610.2, or FHWA Order 6640.23. Because the proposed project would not result in any high and adverse impacts, this analysis concludes that no high and adverse human health or environmental effects of the proposed project are expected to fall disproportionately on minority or low-income populations. The proposed project is

therefore consistent with the policy established in EO 12898, DOT Order 5610.2, and FHWA Order 6640.23.

Mitigation Measures

Recreation

No mitigation measures would be necessary.

Regional and Community Growth

No mitigation measures would be necessary.

Services

The following mitigation measures are proposed to alleviate construction impacts to public services resulting from the proposed project:

- Coordinate with public services to locate construction and future access points prior to construction. If access points used during construction become ineffective during construction, then the access points will be revised.
- Obtain as-built drawings from utilities for use in project design and construction.
- Coordinate with police, fire, ambulance services, and school bus services to keep them apprised of construction activities and detour routes.

To minimize impacts on emergency services, the City and the contractor will inform and update the appropriate City, county, and state police and fire departments of all construction activities that would affect their emergency response procedures. Provisions for emergency vehicle access through the project area would be maintained throughout all phases of construction.

Interruptions to utility services would be minimized by coordinating the relocation of utilities with the contractors' schedules and by notifying customers in advance of any service interruption. Measures would be taken to ensure that existing pipelines are adequately protected against potential adverse effects of the settling that might result from compaction.

For utility lines that must be rerouted or relocated, the City and the contractors will work with the affected utility company to coordinate the necessary modifications.

Pedestrian and Bicyclist Facilities

Space would be maintained on the nonconstruction side of Aurora Avenue North for pedestrians and bicycles during construction.

Wider sidewalks would minimize conflicts between pedestrians and bicyclists when bicyclists are on the sidewalk.

Methodology

The following documents were consulted to assist in developing the existing social and economic conditions in the area and to estimate future population, housing, and employment projections:

- *City of Shoreline Comprehensive Plan* (City of Shoreline, 1998)
- *City of Shoreline Draft Comprehensive Plan Alternatives/DEIS, Economic Development Analysis* (City of Shoreline, November 1997)
- Population and Employment Forecast Report (PSRC, July 1999)
- Economics Discipline Report (CH2M HILL, 2001)

The methodology is based on standard guidelines developed by FHWA and WSDOT for the preparation of environmental documentation. In this analysis, the impact to the City's sales and property tax revenues are discussed. Initial property tax impacts illustrate the potential impacts to property tax collections for local jurisdictions The initial impacts are estimated to occur assuming that all other sources of tax revenue remain constant. Impacts were estimated by using property acquisition information developed by CH2M HILL and parcel tax information obtained from the King County Department of Assessments (King County, 2000). The initial tax impact was compared to total tax revenues for 2000 to assess whether the removal of the taxable properties within the right-of-way would have a substantial impact on the City's ability to cover its operational and maintenance expenses.

The impact on retail sales and use taxes are discussed qualitatively.

Affected Environment

The City, located north of downtown Seattle, was incorporated in 1995. The City is primarily a residential community distinguished by strong neighborhoods, good schools, and parks. The economic activity of the City is centered along Aurora Avenue North and supports retail, commercial, and service businesses. The current economy of the City includes relatively few high-paying jobs and offers a limited range of services, requiring most residents to commute outside of the City for work and to purchase many goods and services.

Population estimates for the City, King County, and the state of Washington are presented in Table 3-11. Over the past 10 years, the City has experienced an average annual growth rate of approximately 0.2 percent, adjusted for annexation and incorporation. In comparison, the population of King County has increased at an average rate of less than 1.1 percent per year and the population of the State of Washington has increased at an average rate of about 1.8 percent per year.

Table 3-11 Historical Population Estimates					
				Average Annual Growth Rate	
Area	1990	2000	2020	1996–2000	2000–2020
City of Shoreline [a,b]	51,839	53,025	55,136	0.2%	0.2%
King County	1,507,305	1,685,600	2,030,674	1.1%	0.9%
Washington State	4,866,663	5,803,400	7,610,089	1.8%	1.4%

Source: Office of Financial Management, State of Washington, 2000; City of Shoreline

[a] 1990 population estimates for the City of Shoreline were adjusted to include current areas of incorporation and annexation.

[b] 2020 population estimates for the City of Shoreline were estimated by applying the PSRC annual growth rate (2000–2020) for the greater Shoreline area to the OFM 2000 population estimate.

Current forecasts from the Puget Sound Regional Council (PSRC) project that the population in the City area will continue to increase through the year 2020; however, the rate of growth is projected to decrease to approximately 0.2 percent annually. During the same time period, PSRC forecasts that King County's population will increase at an annual rate of approximately 1.0 percent and the population of the State of Washington will increase at an annual rate of about 1.4 percent.

Table 3-12 displays the estimated number of housing units for the City and King County. From 1996 to 2000, the City's average annual growth rate outpaced that of King County. The number of housing units in the City increased at an annual rate of approximately 3.0 percent, while that of King County increased at a rate of 1.4 percent. The relatively rapid growth in housing units experienced in the City is likely attributable to additional annexations from 1996-2000 and the overall national trend to move out of larger cities to more suburban areas. Over the next 20 years, the City is projected to add an estimated 1,790 housing units (an annual growth rate of 0.4 percent). From 2000 to 2020, the number of housing units in King County is forecast to increase at a rate of 1.3 percent annually.

Table 3-12 Housing Unit Estimates					
				Average Annual Growth	
Area	1996	2000	2020[a]	1996–2000	2000–2020
City of Shoreline	19,153	21,541	23,331	3.0%	0.4%
King County	705,732	746,293	966,269	1.4%	1.3%

Source: Office of Financial Management, State of Washington, 2000

[a] 2020 housing unit estimates for the City of Shoreline and King County were estimated by applying the PSRC annual growth rate (2000–2020) for the greater Shoreline area and King County to the OFM 2000 housing unit estimate.

The suburban character of the City is illustrated by the number of persons per housing unit. In 2000, the City averaged about 2.5 persons per housing unit, which is greater than the King County average of approximately 2.3 persons per housing unit.

In 1997, the estimated median household income in the City and King County was $62,098 and $57,282, respectively. The City's median household income was estimated to be 8.4 percent greater than King County's median. From 1995 to 1997, the median household income for the City and King County increased at an average annual rate of 5.5 percent.

Table 3-13 displays total employment for the City and King County. In 1997, an estimated 18,686 persons were employed in the City, which represents about 1.7 percent of all of the jobs in King County. By 2020, it is estimated that about 23,247 jobs will be located in the City, an increase of 4,561 jobs from 1997. From 2000 to 2020, the total number of jobs in King County is forecast to increase at a greater annual rate than the total number of jobs in the City.

Employment in the City is dominated by the following three sectors: services, retail, and government/education. As shown in Table 3-14, the services industry accounts for approximately 38 percent of total employment in the City. By 2020, this sector is forecast to account for more than 44 percent of total employment. The retail industry and government/education sectors combined accounted for approximately 58 percent of total employment in the City in 1997. Retail is expected to represent about 24 percent of the total employment in 2020, while government/education will employ nearly 28 percent.

Table 3-13
Employment Forecasts

Area	1997	2000	2020	Average Annual Growth 1997–2020	Average Annual Growth 2000–2020
City of Shoreline Total[a]	18,686	19,975	23,247	2.2%	0.8%
King County Total	1,113,043	1,180,564	1,461,724	2.0%	1.1%
City of Shoreline % of Total	1.7%	1.7%	1.6%	NA	NA

Source: PSRC, 1999
[a] *Estimate for FAZs 6410 and 6420.*

There are approximately 52 businesses along Aurora Avenue North between North 145th Street and North 165th Street. The types of industries represented within the study area are consistent with the businesses found throughout the Aurora corridor. Businesses include automotive dealers and service centers, restaurants, retail stores, casinos, and miscellaneous retail and service establishments.

Compared to King County, the City has relatively larger retail and government/education sectors and relatively smaller wholesale trade, transportation, communications, and utilities (WTCU) and manufacturing sectors. Total employment for both the City and King County is dominated by the services sector.

Over the past few years, the Shoreline area has experienced development in retail and commercial businesses. A partial list of newer businesses in the area includes: Seattle Restaurant Supply, Debbie's Drift on Inn, Central Market, Schuck's Auto Supply, Hollywood Video, and Walgreens Drug Store. One of the larger projects that has recently contributed to the City's economy has been the construction of Home Depot and Costco Wholesale at North 200th Street. Many of these new businesses have the potential to draw customers from outside the immediate area of the City.

The following projects are currently in the building or planning phase within the project area: Shoreline Fire Department Administration and Training Building and Top Foods Grocery Store.

Table 3-14
Employment Forecasts by Industry as Percentage of Total Employment

	Total Employment		% of Total Employment	
Industry	**2000**	**2020**	**2000**	**2020**
City of Shoreline[a]				
Manufacturing	312	368	1.6%	1.6%
WTCU[b]	586	470	2.9%	2.0%
Retail	4,961	5,600	24.8%	24.1%
Services	8,148	10,326	40.8%	44.4%
Gov/Edu[c]	5,968	6,483	29.9%	27.9%
All Sectors	**19,975**	**23,247**	**100%**	**100%**
King County Total				
Manufacturing	165,768	158,837	14.0%	10.9%
WTCU[b]	170,240	196,154	14.4%	13.4%
Retail	198,361	243,537	16.8%	16.7%
Services	486,505	685,747	41.2%	46.9%
Gov/Edu[c]	159,690	177,449	13.5%	12.1%
All Sectors	**1,180,564**	**1,461,724**	**100%**	**100%**

Source: PSRC, 1999

[a] *Estimate for FAZs 6410 and 6420.*
[b] *Wholesale trade, transportation, communication, and utilities.*
[c] *Government and education.*

Assessed Value and Property Tax Revenue

Assessed property value and property tax collected within the City are presented in Table 3-15. According to the King County Department of Assessments, the City had an assessed value of approximately $3.8 billion in 2000. The booming economy experienced in King

County over the past 5 years and the regionwide increase in property values have contributed to the increase in the total assessed valuation of property in the City, which has increased 33 percent since 1996.

Property tax revenues are a major source of revenue for the City. The City collects approximately $1.60 per $1,000 of assessed property value to fund day-to-day operations. Revenues from property taxes are also used to fund local and King County government, the Shoreline School District, the local fire department, libraries, and emergency medical services. The levies collected by King County, public schools, and the fire department are greater than the levy collected by the City.

Table 3-15
City of Shoreline Assessed Property Value and Property Tax Collection

	1996	1997	1998	1999	2000
Assessed Value	$2,816,751,591	$2,874,251,283	$3,091,076,548	$3,405,996,729	$3,764,689,322
Property Taxes to City	$4,339,494	$4,502,573	$4,840,847	$5,292,076	$5,814,403

Source: King County Department of Assessments, 2000a and 2000b; City of Shoreline

Sales and Other Tax Revenue

Retail sales within the City and sales tax revenues received by the City are presented in Table 3-16. In 1999, retail sales totaled more than $501 million. From 1996 to 1999, retail sales increased approximately 36 percent, an average annual growth rate of nearly 8 percent. During the same time period, sales tax revenue increased from about $3.1 million to approximately $4.4 million, an increase of 40 percent. This increase is consistent with the recent arrival of the new major retail businesses in the City and the generally strong regional economy.

Table 3-16
City of Shoreline Retail Sales and Sales Tax Revenue

	1996	1997	1998	1999
Retail Sales	$369,689,615	$432,807,666	$480,657,032	$501,298,976
Sales Tax Revenues to City	$3,103,341	$3,875,655	$4,261,214	$4,358,141

Source: Department of Revenue, State of Washington; City of Shoreline

Retail sales by industry for the City are shown in Table 3-17. In 1999, retail trade represented nearly 71 percent of the total retail sales in the City. Wholesale businesses accounted for approximately 4 percent, construction approximately 12 percent, and services about 8.9 percent of total retail sales. From 1996 to 1999, the wholesale sector's retail sales increased by 187 percent, the construction industry experienced growth of 155 percent, and transportation, communication, and utilities grew by 105 percent.

The City collects tax revenues to pay the expenses and liabilities of the City associated with general service functions. As shown in Table 3-18, property and sales taxes combined

account for the majority of all taxes collected for the General Fund. The City's 2000 budget forecast indicates that 63 percent of the approximately $16.2 million in tax revenues will come from property and retail taxes. Other sources of tax revenue include the gambling tax, motor vehicle excise tax (MVET), utility tax, liquor tax, and other taxes. In 2000, the City implemented utility taxes to offset the loss of revenue that resulted from the legislature repealing the MVET. According to the City's 2000 Adopted Budget, the City did not include future revenue from the MVET in the budget.

Table 3-17
Retail Sales by Industry

Industry	1996	1999	% Change 1996–1999	1999 % of Total
Shoreline Total	$369,689,615	$501,298,976	36%	100%
Retail Trade	$298,305,157	$355,445,401	19%	70.9%
Services	$25,702,574	$44,436,837	73%	8.9%
Construction	$23,140,945	$58,894,518	155%	11.8%
Manufacturing	$6,396,754	$8,448,767	32%	1.7%
TCU	$3,711,056	$7,604,588	105%	1.5%
Wholesale	$6,697,815	$19,211,690	187%	3.8%
Finance, Insurance and Real Estate (FIRE)	$2,325,405	$3,144,550	35%	0.6%
Other	$3,409,909	$4,112,625	21%	0.8%

Source: Department of Revenue, State of Washington.

Table 3-18
General Fund Tax Revenues

Taxes	1998 Actual	1999 Projected	2000 Budget	2000 % of Total
Property Tax	$4,840,847	$5,292,076	$5,814,403	35.9%
Sales Tax	$4,261,214	$4,358,141	$4,424,807	27.4%
Gambling Tax	$1,415,457	$2,100,000	$2,300,000	14.2%
Motor Vehicle Excise Tax*	$639,136	$724,666	$192,336	1.2%
Utility Tax	$0	$0	$2,343,523	14.5%
Liquor Tax	$515,702	$454,206	$461,746	2.9%
Other	$1,846,334	$1,608,308	$635,692	3.9%
Total	**$13,518,690**	**$14,537,397**	**$16,172,507**	**100.0%**

Source: City of Shoreline, 2000

**MVET repealed in 2000 and will no longer contribute to the City's revenues.*

In 2000, the businesses from North 145th Street to North 165th Street contributed approximately $557,000 in sales tax revenue to the City, or 12.6 percent of the total sales tax

revenue budgeted in 2000. The same businesses also contributed approximately $92,000 in property tax revenues in 2000, or about 1.6 percent of total property tax revenues budgeted that same year. In comparison, businesses located along Aurora Avenue North from North 165th Street to North 205th Street accounted for approximately $1.4 million in retail sales tax and $144,000 in property tax revenues in 2000.

Environmental Consequences

Construction Impacts

Impacts to businesses during construction might include temporarily increased congestion, noise, dust, and interrupted or more difficult access. Small businesses and businesses that depend on location or drive-by customers are the most likely to be affected. Real or perceived loss of access or substantial changes in access can create disruptions and reductions in revenue. Some businesses under each alternative would experience temporary negative impacts as driveways are moved, retaining walls are constructed, or buildings are modified. Some businesses might experience a temporary increase in revenues from purchases by construction workers.

The construction of the build alternatives would also generate sales and use tax revenues for the state and the City. According to the Washington State Department of Revenue, "public road construction is subject to retail sales or use tax on the value of all materials incorporated into the bid". (Washington State Department of Revenue, 2000). Materials and labor contracts would be subject to the State's sales or use tax rate of 6.5 percent and the City's rate of 1.9 percent. Costs associated with the acquisition of new right-of-way and engineering would not be subject to state or local sales or use tax.

Operational Impacts

Operational impacts to economic conditions are discussed in terms of mobility and access, property acquisition, parking impacts, and sales and property tax revenue.

No Action Alternative

Under the No Action Alternative, no additional property would be acquired for new right-of-way and there would be no resulting decrease in property tax revenues. Traffic congestion along Aurora Avenue North would likely increase, causing delays in the movement of persons and goods and services to and from the area of the City. Some business owners might decide to move from the area if customers are not able to access their stores or if the movement of goods and services is restricted due to the increased congestion. Customers might also decide to shop in other areas with easier access, less congestion, less risk of traffic crashes, and more attractive appearance. However, other businesses might experience an increase in retail sales from impulse purchases as drivers leave the roadways for relief from the congestion.

The increase in congestion and unsafe conditions might reduce the potential for new development because new businesses might decide to locate in other areas with better customer access, better mobility, less congestion, enhanced safety, and more attractive business and street environments.

Impacts Common to All Alternatives

The movement of goods and persons along Aurora Avenue North from North 145th Street to North 165th Street would be improved under Alternative A. The improved mobility would open up the existing 52 businesses along the corridor to a larger customer base and shorten the commute time for potential employees of businesses within the City. Also, it is likely that redevelopment would occur due to the City's capital investment and the improved image and functionality of the corridor. The BAT lane would make entering and exiting businesses safer and easier for customers. Improved transit access could improve the convenience and desirability of surrounding commercial properties. Increased pedestrian activity could increase the patronage of adjacent retail uses.

Conversely, access to many businesses along Aurora Avenue North might be less desirable during operations because of the removal of left-turn lanes and implementation of other safety improvements. This might impact businesses on the opposite side of the median that rely on impulse purchases because customers might decide to frequent competitors that are located on the same side of the street. This issue will be partially offset by the inclusion of left-turn and U-turn opportunities on an average of every 800 feet for Alternative A and approximately every 650 feet for Alternative B.

The utility companies would pay for the service undergrounding up to the right-of-way, at which point the service undergrounding cost would be the responsibility of the property owner. These conversions would be negotiated with the property owners. Final underground plans would be prepared by the utility companies and would be included in the contract documents.

Businesses along the corridor might experience a modest increase in retail sales activity due to the increased mobility. The congestion relief provided by the project might entice more potential customers to the area. Any increase in sales activity would also benefit the City's revenues in the form of increased sales tax revenues; however, the overall impact on the City would likely be small.

Both alternatives would use some portion of the existing state-owned and tax-exempt right-of-way located along the corridor. The remaining right-of-way would be acquired from taxable property within the City. The taxable property acquired would be removed from the City's tax roles, with the potential for impacting property tax revenues.

In the long term, the loss of property tax revenues due to property acquisition might be offset by an increase in property tax revenues associated with increased property values. The roadway improvements have the potential to contribute to an increase in property values within the corridor. Property values will be determined by market forces, which are driven by supply and demand. The roadway improvements will improve access to businesses in the area, which might make properties more attractive for businesses and new development. Other factors that affect property values include local zoning and land use regulations, local development trends, and other social and economic factors.

Alternative A

Property Acquisition

Although the proposed project would require acquisition of additional property between North 145th Street and North 165th Street, the proposed alignment would not displace any businesses or employees along the project corridor.

Property acquisition would reduce the amount of parking for some businesses and also reduce the amount of frontage that some businesses use to display their products. Overall, Alternative A would require acquisition of 34,309 square feet of new right-of-way, which represents approximately 0.7 percent of the total square footage of the potentially impacted parcels along the corridor.

Based on the current alignment for Alternative A, individual businesses would experience varying degrees of impacts due to new property acquisition. Approximately 2,450 square feet, or about 24 percent, of the parcel occupied by Pizza Hut would be acquired for the new alignment. It is likely that the impacts to this business could be effectively mitigated by rearranging parking spaces.

European Motors would lose approximately 2.4 percent of its parcel to new right-of-way that it currently uses to display its products. However, the impact would be expected to be negligible because the business would have sufficient property remaining to accommodate the modified frontage. Property owners would be compensated at fair market value for land and other necessary site mitigations.

Parking

There are a total of 2,004 parking spaces within the project area. Alternative A would impact an estimated 102 parking spaces. Of the total impacted parking spaces, 76 are non-compliant parking spaces that do not conform with the City code or are in publicly owned right-of-way, and 26 are compliant spaces. While these businesses have relied on the use of non-compliant parking spaces for overflow parking and display purposes in the past, the City is not required to mitigate the loss of non-compliant spaces.

Property acquisition would impact compliant parking stalls for businesses as shown in Table 3-19. Some impacted businesses would lose one or two spaces, which would not be a substantial impact. Others would need their parking lots reconfigured to maximize the number of parking stalls available to mitigate parking impacts. In these situations, enough parking stalls would be provided to be compliant with the City of Shoreline's off-street parking requirements (SMC 20.50.390). Property acquisition would impact seven parking stalls for Start Mart, which is an auto repair shop that uses lot spaces for storage of vehicles rather than for customer parking needs. Most of the parking spaces at this location are not signed or designated. None of the parking spaces generally used by customers would be impacted. However, by working with the business representatives and reconfiguring the lot to suit their needs, at least four of the seven spaces could be replaced. The Pho Thanh Restaurant would lose seven spaces from project impacts; however, reconfiguring the parking lot would recover five spaces, resulting in an overall loss of two parking spaces. Pizza Hut would have about 5 stalls of 13 total parking spaces affected. Pizza Hut currently relies on several non-compliant parking spaces within the Westminster Way right-of-way. The City will mitigate this loss of parking from Alternative A by reconfiguring the Pizza Hut parking lot and allowing additional parking within the Westminster Way right-of-way.

Table 3-19
Alternative A--Parking Impacts

Business Name	Address	Parcel SF	SF Acquired	Total Stalls on Parcel (Compliant and Non-Compliant)	Compliant Parking Stalls Impacted	Non-Compliant Parking Stalls Impacted	Stalls Remaining After Mitigation
Start Mart	14507 Aurora Ave N	12,183	847	20	7	1	16
Pho Thanh	14513 Aurora Ave N	16,812	561	23	7	0	21
Hideaway Card Room	14525 Aurora Ave N	23,027	569	52	0	3	49
Pepperhill/Care Plus	14701 Aurora Ave N	84,096	2,363	105	1	13	91
Shurgard	14540 Aurora Ave N	274,066	2,552	11	1	0	10
Seattle Ski Rental	14915 Aurora Ave N	14,688	1,029	15	2	0	14
Aurora Vision	14926 Aurora Ave N	15,952	254	15	2	0	13
Goldies Management	15036 Aurora Ave N	10,233	305	18	0	6	12
Maddy's Automotive	15205 Aurora Ave N	16,041	70	9	0	1	8
Allstate/Pho Ha	15215 Aurora Ave N	19,722	0	12	0	1	11
Pizza Hut	15565 Aurora Ave N	10,001	2,450	13	5	0	12
Four Seasons/Shay's	15744 Aurora Ave N	17,473	458	32	0	11	21
Electronics/Dan's Produce	16053 Aurora Ave N	22,369	307	19	0	10	9
Taiho	16301 Aurora Ave N	22,556	68	38	0	9	29
Arden Rehabilitation	16257 Aurora Ave N	116,336	169	50	1	0	49
Sidestreets crossing Aurora*				445	0	21	434

*Includes 36 parcels spread over N 145th, N 149th, N 152nd, N 155th Westminster Way, N 160th, N 163rd, N 165th as well as the project limits on Aurora south of 145th and north of 165th

The parking area will be reconfigured so that only one parking space would be lost. Four Season's and Shay's would have 11 parking stalls disrupted, Dan's Produce Market and Electronics Clearance Center would have 10 stalls disrupted, and Taiho would have 9 stalls disrupted. However, all of the impacted parking stalls for both of these businesses are non-compliant and are not required to be mitigated.

No compliant parking designated as ADA accessible parking stalls will be lost as a result of property acquisition associated with the project, and the loss of parking stalls will not affect ADA accessibility to individual businesses. Care Plus currently has a non-compliant parking stall designated a Handicapped parking stall. The parking lot for Care Plus will be reconfigured to provide compliant ADA accessible Handicapped parking.

Sales and Property Tax Revenue

Table 3-20 shows the initial property tax impacts for the City under Alternative A. The assessed value of the additional right-of-way is approximately $663,639. The taxable property within the right-of-way generates about $1,086 in revenues for the City, or less than 0.1 percent of 2000 budgeted property tax revenues. The initial property tax impact would not have a major impact on the City's overall tax revenues.

Table 3-20
Estimated Initial Property Tax Impact—Alternative A

	Estimated Assessed Value of Right-of-Way	Initial Property Tax Impact [a]	Percent of Budgeted 2000 Property Tax Revenues
Property Tax	$663,639	$1,086	0.019%

Source: King County Department of Assessments, 2000a and 2000b
[a] *Includes City of Shoreline portion of property tax only*

The total initial property tax impact includes the impact for full displacements and for partial encroachments. The tax impact for the partial encroachments was calculated by multiplying the actual 2000 property tax collected for the parcel by an estimate of the percentage of the parcel taken for the project. Details on the calculations for the initial property tax impact are presented in Appendix A-1 in the Economics Discipline Report.

Alternative B

Property Acquisition

Although the proposed project would require acquisition of property between North 145th Street and North 165th Street, the proposed alignment would not displace any businesses or employees along the project corridor. The amount of property needed for the current design of Alternative B is less than the property take under Alternative A.

Property acquisition would reduce the amount of parking for some businesses and also reduce the amount of frontage that some businesses use to display their products. Overall, Alternative B would require acquisition of 20,453 square feet of new right-of-way, which represents approximately 0.4 percent of the total square footage of the potentially impacted parcels along the corridor.

Based on the current alignment for Alternative B, individual businesses would experience varying degrees of impacts due to new right-of-way acquisition. Approximately 1,667 square feet, or about 17 percent, of the parcel occupied by Pizza Hut would be acquired for the new alignment. It is likely that the impacts on this business could be effectively mitigated by rearranging parking spaces.

European Motors would lose approximately 3.6 percent of its parcel to new right-of-way that it currently uses to display its products. However, the impact would be expected to be negligible because the business would have sufficient property remaining to accommodate the modified frontage.

Parking

Because Alternative B has a narrower cross section than Alternative A, it would impact fewer total parking spaces—an estimated 80 compliant and non-compliant spaces. Of the total impacted parking stalls, 61 are non-compliant parking spaces that do not conform with the City code or are in publicly owned right-of-way, and 19 are compliant stalls. While these businesses have relied on the use of non-compliant parking spaces for overflow parking and display purposes in the past, the City is not required to mitigate the loss of non-compliant spaces.

Property acquisition would impact compliant parking stalls for businesses as shown in Table 3-21. Some impacted businesses would lose one or two spaces, which would not be a substantial impact. Others would need to reconfigure their parking lots to maximize the number of parking stalls available to mitigate parking impacts. In these situations, enough parking stalls would be provided to be compliant with the City of Shoreline's off-street parking requirements (SMC 20.50.390). Start Mart would have four spaces impacted, but they would all be mitigated. The Pho Thanh Restaurant would have five spaces impacted, but would have no net loss of parking after mitigation. Similarly, Pizza Hut's four impacted spaces would be fully mitigated in the same manner as described in Alternative A. Dan's Produce Market and Electronics Clearance Center and Taiho would have seven and nine stalls disrupted, respectively. However, all of the impacted parking stalls for both of these businesses are non-compliant and are not required to be mitigated.

No compliant parking designated as ADA accessible parking stalls will be lost as a result of property acquisition on the project, and the loss of parking stalls will not affect ADA accessibility to individual businesses. Care Plus currently has a non-compliant parking stall designated a Handicapped parking stall. The parking lot for Care Plus will be reconfigured to provide compliant ADA accessible Handicapped parking.

Sales and Property Tax Revenue

Table 3-22 shows the initial property tax impacts for the City under Alternative B. The assessed value of the additional right-of-way would be approximately $343,862. The taxable property within the right-of-way generates about $574 in revenues for the City, or less than 0.1 percent of 2000 budgeted property tax revenues. The initial property tax impact would not have a major impact on the City's overall tax revenues.

The total initial property tax impact includes the impact for full displacements and for partial encroachments. The tax impact for the partial encroachments was calculated by multiplying the actual 2000 property tax collected for the parcel by an estimate of the

Table 3-21
Alternative B--Parking Impacts

Business Name	Address	Parcel SF	SF Acquired	Total Stalls on Parcel (Compliant and Non-Compliant)	Compliant Parking Stalls Impacted	Non-Compliant Parking Stalls Impacted	Stalls Remaining After Mitigation
Start Mart	14507 Aurora Ave N	12,183	350	20	4	1	20
Pho Thanh	14513 Aurora Ave N	16,812	40	23	5	0	23
Hideaway Card Room	14525 Aurora Ave N	23,027	23	52	0	3	49
Pepperhill/Care Plus	14701 Aurora Ave N	84,096	0	105	0	13	92
Shurgard	14540 Aurora Ave N	274,066	1,356	11	1	0	10
Seattle Ski Rental	14915 Aurora Ave N	14,688	343	15	2	0	13
Aurora Vision	14926 Aurora Ave N	15,952	305	15	2	0	13
Goldies Management	15036 Aurora Ave N	10,233	134	18	0	5	13
Maddy's Automotive	15205 Aurora Ave N	16,041	70	9	0	1	8
Allstate/Pho Hoa	15215 Aurora Ave N	19,722	0	12	0	1	11
Pizza Hut	15565 Aurora Ave N	10,001	1,677	13	4	0	13
Electronics/Dan's Produce	16053 Aurora Ave N	22,369	36	19	0	7	12
Taiho	16301 Aurora Ave N	22,556	131	38	0	9	29
Arden Rehabilitation	16257 Aurora Ave N	116,336	118	50	1	0	49
Sidestreets crossing Aurora*				445	0	21	424

*Includes 36 parcels spread over N 145th, N 149th, N 152nd, N 155th Westminster Way, N 160th, N 163rd, N 165th as well as the project limits on Aurora south of 145th and north of 165th

percentage of the parcel taken for the project. Details on the calculations for the initial property tax impact are presented in Appendix A-2 in the Economics Discipline Report.

Table 3-22
Estimated Initial Property Tax Impact—Alternative B

	Estimated Assessed Value of Right-of-Way	Initial Property Tax Impact [a]	Percent of Budgeted 2000 Tax Revenues
Property Tax	$343,862	$574	0.01%

Source: King County Department of Assessments, 2000a and 2000b
[a] *Includes City of Shoreline portion of property tax only.*

Secondary and Cumulative Impacts

The cumulative impacts of the project and other nearby projects, such as the Interurban Trail and future improvements to Aurora Avenue North between North 165 Street and North 205th Street, would be to increase the accessibility of the area's businesses to a variety of travel modes. The increase in retail activity would present the potential to accelerate and intensify the pace at which development occurs within the project area.

The overall improvement in mobility resulting from the Aurora Corridor Project is intended to encourage more intensive development within the project area in accordance with the City's Comprehensive Plan. Normal redevelopment would be expected to occur over time on vacant land and in the renovation of older buildings in the project area. Redevelopment would be primarily commercial in nature in accordance with the City's Comprehensive Plan and would likely result in employment opportunities. To the extent development and redevelopment within the project area would occur, cumulative impacts could include increased employment opportunities, increased assessed values and property tax revenues, and increased retail sales activity and sales tax revenues.

Overall economic benefits that would likely occur due to the completion of the project from North 145th Street to North 165th Street would also extend to the entire 3-mile corridor under the cumulative scenario. The long-term cumulative impacts of this project and future improvements to Aurora Avenue North between North 165th Street and North 205th Street would be to increase the mobility of persons and goods travelling through the corridor. The decreased congestion and the streetscape enhancements could entice shoppers from outside the area to visit the corridor, which could increase retail sales activity. During construction, however, businesses might experience a decrease in retail activity as access is potentially restricted or modified during construction of the project. The impacts associated with the construction of the project are expected to be temporary and not substantial.

The improvements between North 145th Street and North 165th Street and the future project from North 165th Street to North 205th Street would require the acquisition of additional right-of-way to accommodate the current design. The purchase of the property would impact retail and property tax revenues collected by the City, relocate businesses and their

employees, and remove parking from the area. Property acquisition would remove taxable property from the City's tax base, thus impacting property tax collections. Property acquisition would also displace an estimated 25 businesses and approximately 227 employees. According to preliminary design plans, all of the displacements would occur between North 165th Street and North 205th Street. These 25 businesses generate an estimated $14 million in retail sales annually. Since no displacements occur from North 145th Street to North 165th Street, the proposed project would not add to any cumulative impacts associated with the potential displacement of businesses and employees from these other projects.

The assessed value of the cumulatively acquired property is approximately $5.1 million dollars, which generates about $51,000 in property tax revenue for the City. The initial loss in tax revenue represents approximately 2 percent of the total tax revenues budgeted by the City in 2000. Assuming that some of the displaced businesses relocate outside the City limits, the City would lose less than $266,000 in retail sales tax revenues. (The projected value of the sales tax revenue loss if all displaced businesses relocated outside the City limits.) The combined impact of the initial property tax impact and the potentially lost sales tax revenue from the displaced businesses would be between $51,000 and $317,000. By comparison, the initial fiscal impacts represented by the project between North 145th Street and North 165th Street is less than 0.5 percent of the 2000 budgeted property tax revenues.

The loss of retail sales and property tax revenues would likely be offset by increased retail activity associated with the improved access and mobility throughout the 3-mile corridor. New development and redevelopment of property along the corridor might also occur and could draw customers from inside and outside the City limits. If new development occurs, the new buildings would be added to the City's tax base and would generate property tax revenues for the City. An example of the potential impact of new development on the City's tax base is the redevelopment of the new Walgreens' Drugstore along Aurora Avenue North. In 1998, the parcel had a total assessed value (including improvements) of $2.1 million, which contributed approximately $3,360 to the City's revenues. For 2002, the assessed value of the property (including improvements) will increase to $2.8 million, which will generate approximately $4,480 in property tax revenues for the City, an increase of 33 percent from 1998. The new development would help off-set any fiscal impacts associated with the acquisition of new right-of-way. Overall, the fiscal impacts associated with the property takes and the business relocations would not be a substantial impact to the City.

Preliminary drawings for the future improvements between North 165th Street and North 205th Street show that the future improvements to the Aurora Avenue North Corridor would result in additional losses of parking stalls. The City would attempt to mitigate the loss of parking spaces by restriping or reconfiguring remaining parking lots during further design and development of the Aurora corridor from North 165th Street to North 205th Street.

Mitigation Measures

Measures to mitigate identified potential impacts could include the following:

- Installing temporary signage to inform drivers that access to businesses during construction is temporarily changed or restricted and that businesses are open. Notify community through newspaper that businesses are open and identify possible detour routes.
- Requiring contractors to submit and receive approval of a construction plan to maintain access for all properties and businesses adjacent to construction activity. Interruptions to businesses would be expected to be minimal.
- Compensating property owners for the fair market value of property acquired for new right-of-way, in accordance with the *Aurora Avenue North Right-of-Way Policies and Procedures Manual* and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.
- Working with impacted businesses that lose compliant parking spaces to reconfigure the remaining parking area to maximize the number of available parking spaces. Parking lot reconfiguration will occur as part of the project. This includes restriping parking areas to maximize the number of parking spaces.
- Install permanent signage to direct vehicles to legal U-turn intersections.

The results of the analysis indicate that no substantial adverse air quality impacts are anticipated as a result of the proposed project. Mitigation is proposed only for the construction phase to minimize impacts from fugitive dust and diesel-fueled construction equipment.

This analysis presents an overview of the air quality regulatory setting and conformity requirements for the Aurora Corridor Project, which included identification of impacts during both the construction and operation phases of the project. Air quality models were run to determine the effect of the proposed changes on carbon monoxide (CO) concentrations at selected intersections in the vicinity of the project, and to determine if the proposed alternatives would be in conformance with national, state, and local ambient air quality standards.

Regulatory Setting

The major airborne pollutants of interest in the central Puget Sound region include CO, particulate matter, ground-level ozone, and ozone precursors (volatile organic compounds [VOCs] and oxides of nitrogen [NO_X]). These regulated pollutants are among those commonly referred to as criteria pollutants. National Ambient Air Quality Standards (NAAQS) specify the criteria pollutant concentrations that must not be exceeded over specified time periods.

Primary air quality standards are defined to protect public health; secondary standards are intended to protect the natural environment. Table 3-23 shows the primary and secondary NAAQS for the major airborne pollutants of concern. Ecology and the Puget Sound Clean Air Agency (PSCAA) have adopted state and local ambient air quality standards that are equivalent to the national standards.

EPA revised the ozone standard in 1997 from 0.12 ppm (1-hour average) to 0.08 ppm (8-hour average). The region, an attainment maintenance area for the old ozone standard since 1996, is expected to meet the new ozone standard as well. In addition to the current PM_{10} standards, EPA adopted new federal air quality standards for particulate matter less than 2.5 microns ($PM_{2.5}$) in diameter. Although PSCAA's preliminary analysis indicates that the region should be able to meet EPA's revised standards for $PM_{2.5}$, the standard was ruled invalid by a federal court in May 1999. On February 27, 2001, the U.S. Supreme Court upheld the constitutionality of the Clean Air Act (CAA) as EPA had interpreted it in setting the 1997 health-protective ambient air standards. It is uncertain, at this time, when the new ozone and particulate standards, including PM_{10}, will be enforced.

The majority of the central Puget Sound region is now in attainment for all criteria pollutants. EPA redesignated the region maintenance attainment status on October 10, 1996, for CO, and on November 26, 1996, for ground-level ozone. Part of Seattle's Duwamish industrial, previously designated non-attainment for PM_{10}, was recently designated maintenance attainment after several years of clean air monitoring data have been collected by PSCAA (*Federal Register* March 13, 2001, Volume 66, Number 49).

Table 3-23
National, State, and Local Ambient Air Quality Standards

Pollutant	National		Washington State	Puget Sound Region
	Primary	Secondary		
Carbon Monoxide				
8-Hour Average	9 ppm	NS	9 ppm	9 ppm
1-Hour Average	35 ppm	NS	35 ppm	35 ppm
Ozone				
8-Hour Average	0.08 ppm	0.08 ppm	0.12 ppm[a]	0.12 ppm[a]
Lead				
Maximum Arithmetic Mean (averaged over calendar quarter)	1.5$\mu g/m^3$	1.5$\mu g/m^3$	NS	1.5$\mu g/m^3$
Particulate Matter (PM_{10})				
Annual Arithmetic Average	50 $\mu g/m^3$	50 $\mu g/m^3$	50 $\mu g/m^3$	50 $\mu g/m^3$
24-Hour Average[b]	150 $\mu g/m^3$	150 $\mu g/m^3$	150 $\mu g/m^3$	150 $\mu g/m^3$
Particulate Matter ($PM_{2.5}$)[c]				
Annual Arithmetic Average	15 $\mu g/m^3$	15 $\mu g/m^3$	[a]	[a]
24-Hour Average	65 $\mu g/m^3$	65 $\mu g/m^3$	[a]	[a]
Particulate Matter (TSP)				
Annual Geometric Average	NS	NS	60 $\mu g/m^3$	NS
24-Hour Average	NS	NS	150 $\mu g/m^3$	NS

Source: PSCAA, 1996 Data Summary

[a] Washington State and PSCAA have not yet adopted the new standard. Enforceability of new standards questioned by federal appeals court (American Trucking Associations v. EPA, No. 97-1440, 1999 WL).
[b] Adjusted in 1997 by changing form of standard. That change was ruled invalid by a federal appeals court in May 1999.
[c] New national standard, 1997 status unsure, pending further briefing in American Trucking Association case.

$\mu g/m^3$ = micrograms per cubic meter
ppm = parts per million
NS = no standard established

The project is far removed from the Duwamish industrial area, and, therefore, the project is not anticipated to affect that area.

In the state of Washington, transportation projects located in maintenance and non-attainment areas are subject to the following conformity requirements imposed by the federal CAA and the Washington Clean Air Act (WCAA):

- The federal CAA requires that transportation projects located in non-attainment and maintenance areas conform with the State Implementation Plan (SIP), the state's plan for

meeting and maintaining compliance with the NAAQS. EPA regulations (40 CFR Part 93) implement the CAA. Conformity to a SIP means that transportation activities would not produce new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS.

- The WCAA and the state conformity regulations (WAC 173-420) similarly state that approval or funding of a project within, or affecting, a non-attainment area is contingent on determining that it conforms with the SIP, as required by the federal CAA. In addition, under the state's Growth Management Act (GMA), regionally significant projects must be included in the Regional Transportation Plan (RTP) and the Transportation Improvement Program (TIP). Predicted concentrations in the vicinity of the project which would not support a determination of conformity would be considered a fatal flaw for a transportation project.

Methodology

Due to the temporary and variable nature of construction activities, impacts during the construction phase were evaluated qualitatively. The typical sources of air emissions associated with construction activities were identified, along with the management practices that would likely be used to mitigate the potential impacts.

The operational impacts were evaluated quantitatively using EPA-approved emission and dispersion models. These models are described in detail in the Air Quality Discipline Report. Operational impacts would include the effects to ambient air concentrations in the project vicinity related to changes in traffic volumes, traffic delays, and changes in roadway configuration. A description of the traffic modeling from which this information was obtained can be found in the Transportation Discipline Report.

CO is the pollutant typically analyzed for transportation projects because motor vehicles are the primary source of CO emissions in most areas. CO concentrations tend to be worse in the winter, when colder temperatures result in less efficient engine combustion, and stagnant atmospheric conditions can result in a localized elevated concentration. Of all regulated pollutants, the CO NAAQS is most likely to be violated as a result of motor vehicle emissions, particularly at high-volume intersections with a substantial level of delay.

Other pollutants associated with transportation projects include photoreactive VOCs and particulate matter less than 10 microns in diameter (PM_{10}). VOCs are precursors to ozone in and around urban areas. The formation of ozone occurs some distance downwind of the VOC emissions after sufficient exposure of the precursor pollutants to ultraviolet radiation from sunlight. Analysis of this delayed ozone formation effect is unwarranted in the immediate vicinity of an intersection and therefore is not part of a hotspot analysis. No analysis on PM_{10} is required because the project is not located in or near a non-attainment or maintenance area for that pollutant.

Therefore, CO is the focus of this analysis. A detailed description of the methodology used to estimate CO concentrations in the vicinity of the project is included in the Air Quality Discipline Report. The results of this analysis are summarized below.

Affected Environment

The Aurora Corridor Project is located in the Puget Sound region, which has a relatively mild climate. The Olympic Mountains buffer the area from the weather that arrives from the Pacific Ocean. The summer months are characterized by moderate temperatures and light and variable winds, which tend to blow from the north. Summer weather is often dominated by persistent high-pressure cells, resulting in stagnant air conditions, which can contribute to the formation of photochemical smog, as indicated by ozone concentrations downwind from urban centers.

Storm fronts that pass through the area frequently during the spring and fall and occasionally during the winter are usually the source of the region's southerly winds. Winter weather can also produce stable or stagnant conditions that coincide with temperature inversions. The average precipitation is 30 to 40 inches per year. The nearest National Weather Service station to the project site is at Seattle-Tacoma International Airport. The predominant wind directions measured at this station are from the south and south-southwest.

The project area is a major north-south arterial street, with three signalized intersections in the section analyzed.

Environmental Consequences

Construction Impacts

Construction activities primarily generate PM_{10} and $PM_{2.5}$ and small amounts of CO and NO_x from construction machinery exhaust. Specifically, the sources of particulates would be dust from earth-moving excavation activities (termed "fugitive dust") and diesel smoke. Sources of PM_{10} and $PM_{2.5}$ in Western Washington include motor vehicles, industrial boilers, wood stoves, open burning, and dust from roads, quarries, and some construction activities. High PM_{10} concentrations typically occur in fall and winter during periods of air stagnation and high use of wood for home heating.

Fugitive dust consists of fine particles of earth and sand that become airborne and then disperse, typically as a result of earth-moving activities, demolition, general construction activities, and vehicles traveling on unpaved or dusty roads. Trucks exiting unpaved sites or carrying soil might track dirt onto adjacent paved streets, causing fugitive dust that is dispersed by subsequent traffic. This particulate matter would be carried by wind to nearby residences, businesses, and public areas.

Demolition activities would also occur in the project area, in the form of removal of concrete and asphalt paving. This demolition would be another source of fugitive dust emissions on a temporary basis. It is anticipated that the construction impacts for Alternative A would be only slightly higher than those of Alternative B, due to the larger footprint associated with the wider sidewalks of Alternative A.

The amount of fugitive dust that would be raised by such activities and the distance that it would disperse depends on the dryness and texture of the soil, the wind velocity, and the amount of machinery and truck travel on unpaved surfaces. Fugitive dust is most common

during dry, windy weather. The larger particles would settle out near the source, while finer particles would be dispersed farther from the construction site. The quantity of particulate emissions generated from construction activities would be proportional to the area of construction. At this time, it is not possible to provide a quantitative estimate of the particulate emissions that could be generated; however, there would be a noticeable temporary increase in particulate emissions if no mitigation measures are implemented to control them. It is typical for construction projects to implement mitigation (as described later in this report) to offset temporary increases in particulate emissions.

Operational Impacts

Although the project will not result in an overall increase in traffic volumes in the project area above volumes predicted for the No Action Alternative, each alternative was analyzed to determine if the proposed signalization and lane geometry modifications would result in adverse impacts to air quality. In general, the purpose of the project is to provide additional capacity in the corridor, thereby reducing the delay experienced by vehicles traveling in that corridor. Less delay would mean higher travel speeds and less idling time at intersections, conditions typically conducive to a reduction in pollutant emissions from vehicle exhaust.

Addition of the Business Access/Transit Lane is anticipated to have a positive effect on air quality for several reasons. Improved transit speed, resulting from travel in a less congested lane, would likely encourage more riders to switch from single-occupancy vehicle mode. Also, buses should experience less delay associated with reentry into the transit lane, resulting in a decrease in emissions from buses idling at bus stops.

No Action Alternative

Existing conditions within the project limits along the Aurora Avenue North corridor are such that there is an unacceptable amount of traffic delay at the three signalized intersections (indicated by level of service [LOS] ratings presented in the Transportation Discipline Report and in Figures 3-1 and 3-2 of this report). Excessive delays cause vehicles to idle and to travel at very low speeds, conditions under which vehicles produce the greatest amount of emissions. If there are no improvements to the corridor, and if the growth rate remains the same or increases, traffic delays would increase, causing an increase in the volume of vehicle emissions from idling and slow-moving traffic.

In selecting the intersections on which to perform a project-level analysis, the predicted LOS was reviewed for the opening year (2004) and the design year (2020). The analysis was focused on the three signalized intersections within the project limits: the intersections of SR 99 at North 145th Street, North 155th Street, and North 160th Street. A detailed description of the selection process and modeling methodology is provided in the Air Quality Discipline Report.

Table 3-24 shows the results of modeling the various alternatives and indicates that the No Action Alternative would result in 1-hour CO concentrations equal to those of both of the build alternatives in the vicinity of the intersection at North 145th Street in 2004 and 2020. The No Action Alternative is predicted to have lower CO concentrations than both build alternatives at the North 155th Street intersection for both forecast years. The No Action Alternative is predicted to cause a slightly higher CO impact in 2004, but the same impact in

2020 as the build alternatives. Table 3-25 show the results for the 8-hour CO concentrations, which have the same conclusion as for the 1-hour.

Alternative A

The results shown in Tables 3-24 and 3-25 indicate that the CO concentrations predicted for Alternative A are the same as those for the No Action Alternative in the vicinity of SR 99 and North 145th Street, and slightly higher than those of the No Action Alternative in the vicinity of SR 99 and North 155th Street. Although predicted 8-hour concentrations are higher than the NAAQS at the North 145th Street intersection, Alternative A would not create a new CO violation of the NAAQS, nor would it worsen an existing violation. CO concentrations for Alternative A in the vicinity of SR 99 and North 160th Street are the same (2004) or less than (2020) those predicted for the No Action Alternative and are, in both years, less than the NAAQS.

Alternative B

Traffic forecast data indicate that traffic volumes and travel speeds for Alternative B will be essentially the same as those for Alternative A; therefore, the air quality impacts are anticipated to be the same, as indicated in Tables 3-24 and 3-25. All traffic data used in the analysis, including LOS, lane configurations, and traffic volumes is described in detail in the Transportation Discipline Report for this project.

Table 3-24
Maximum 1-Hour CO Concentrations (ppm) at Aurora Avenue Intersections

			2004		2020	
Intersection	1-hour NAAQS	2000 Existing	No Action Alternative	Alternatives A and B	No Action Alternative	Alternatives A and B
North 145th Street	35	16.0	15.3	15.3	15.0	15.0
North 155th Street	35	12.5	10.0	12.1	9.8	11.7
North 160th Street	35	11.2	10.2	10.2	9.9	9.8

Table 3-25
Maximum 8-Hour CO Concentrations (ppm) at Aurora Avenue Intersections

			2004		2020	
Intersection	8-hour NAAQS	2000 Existing	No Action Alternative	Alternatives A and B	No Action Alternative	Alternatives A and B
North 145th Street	9	11.2	10.71	10.71	10.5	10.5
North 155th Street	9	8.75	7.0	8.47	6.86	8.19
North 160th Street	9	7.84	7.14	7.14	6.93	6.86

Secondary and Cumulative Impacts

Secondary impacts associated with this project would involve the effects of increased traffic volumes in the project vicinity. The traffic analysis performed for this project accounted for changes in traffic patterns and volumes associated with the projects and development proposed in the Comprehensive Plan and, therefore, have been accounted for in the air quality analysis for this project. It should be noted that these projects and development are the same for the No Action Alternative as for the build alternatives and are based on land use decisions by local agencies and not the presence of improved transportation facilities. Therefore, as stated previously, there is no increase in traffic volumes associated with the project.

Cumulative impacts associated with planned improvements to the Aurora corridor north of the Aurora Corridor Project have been accounted for in the traffic modeling used as the basis for determining air quality impacts. To select the intersections on which to perform a project-level analysis, the predicted LOS was reviewed for the estimated opening year for the future improvements along Aurora Avenue North, from North 165th Street to North 205th Street (2007), and also for its design year (2020). There are currently eight signalized intersections within the project limits of Aurora Avenue North, and the projects combined include adding signals at additional points along the roadway. Because the quantitative model chosen for this analysis, CAL3QHC, is designed for analyzing signalized intersections, the eight currently signalized intersections are the focus of the air quality analysis. The intersections were ranked according to average daily traffic (ADT) projected for 2020 and LOS. The intersections at North 145th Street, North 155th Street, North 175th Street, and North 205th Street were chosen for the analysis because these are projected to have the worst LOS in 2020. They are also four of the five highest with respect to projected ADT. This ranking procedure is typically the method used to select intersections on which to perform "hot spot" analyses for conformity determination.

Projects located in non-attainment or maintenance areas for a given pollutant must comply with provisions of the 1990 Clean Air Act Amendments. Projects must also comply with the promulgated state and federal rules that require a determination of conformity with the SIP. These projects are located in the Puget Sound region, a maintenance area for both CO and ozone.

The results of the CO concentrations analysis at specific intersections show that the cumulative impacts of the Aurora Avenue North projects would not create a new CO violation of the NAAQS, nor would it worsen an existing violation. Therefore, these projects would conform to the Washington SIP. These results are shown in Table 3-26.

Two additional projects, the Interurban Trail project and the Pedestrian Safety Demonstration project at North 165th Street and North 170th Street, which involves installation of an additional traffic signal to allow pedestrians to safely cross the arterial, are assumed to have been analyzed along with this project. It was assumed that these cumulative impacts were taken into account in the traffic analysis and, therefore, they are included in the air quality analysis.

Table 3-26
Maximum 8-Hour CO Concentrations (ppm) at Aurora Avenue Intersections (North 145th Street to North 205th Street)

Intersection	8-hour CO NAAQS	2000 Existing	2007		2020	
			No Build	Build	No Build	2020 Build
North 145th Street	9	11.2	10.71	10.71	10.5	10.5
North 155th Street	9	8.75	7.0	8.47	6.86	8.19
North 175th Street	9	9.17	7.98	8.4	7.7	8.05
North 205th Street	9	6.37	5.67	5.95	5.53	5.74

Mitigation Measures

PSCAA is responsible for enforcing air quality regulations in King and Snohomish Counties, and has developed fugitive dust regulations contained in Regulation 1 on Fugitive Dust Emissions, Section 9.15. This project shall adhere to all applicable regulations relating to air quality, including those of PSCAA. Best Management Practices for Fugitive Dust control will be used as outlined in the Association of General Contractor's Fugitive Dust Handbook. Mitigation measures shall include the following:

- Using water spray as necessary to prevent visible dust emissions, particularly during demolition of brick or concrete structures by mechanical or explosive methods
- Preventing dust emissions during transport of fill material or topsoil by covering the load, either by wetting down the load or by ensuring adequate freeboard on trucks
- Promptly cleaning up any spills of transported material on public roads by frequently using a street-sweeper machine
- Covering loads of hot asphalt to minimize odors
- Scheduling work tasks to minimize disruption of the existing vehicle traffic on streets in the vicinity of the station sites
- Maintaining all construction machinery engines in good mechanical condition to minimize exhaust emissions

Conformity Determination

With a substantial impact defined as the inability of the project to demonstrate conformity with the CAA and Washington SIP, no substantial air quality impacts would be anticipated as a result of this project.

Projects located in non-attainment or maintenance areas for a given pollutant must comply with provisions of the 1990 Clean Air Act Amendments. Projects must also comply with the

promulgated state and federal rules that require a determination of conformity with the SIP. The project is located in the Puget Sound region, a maintenance area for both CO and ozone.

The proposed project is included in the 1995 Master Transportation Plan (MTP) and the 1998 Transportation Improvement Program (TIP), both of which have been found to meet the conformity tests as identified by federal and state conformity regulations.

The project does not cause a new, or worsen an existing, violation of the CO NAAQS, and, therefore, is demonstrated to conform with the Washington SIP, the CAA, and the Washington Clean Air Act.

Methodology

The following procedures were used to determine the noise impacts of the project:

- Inspection of the project area and categorization of existing land use
- Measurement of existing noise levels using a Larson-Davis Model 814 integrating Type 1 sound-level meter
- Existing year (2000) PM peak noise impacts were modeled
- Calculation of project-related future noise levels
- Determination of traffic noise impacts
- Examination and evaluation of alternative noise abatement

A reconnaissance of the project area was conducted to locate sensitive receptors (based on FHWA Noise Abatement Criteria activity categories) and to determine their distances from the proposed project. Field measurements were taken at the location of the sensitive receptors to determine background noise levels. Measurements were made in accordance with the procedures in the FHWA publication *Measurement of Highway-Related Noise* (FHWA, 1996). All measurements and references to noise levels are in dBA L_{eq}. Concurrent traffic counts were taken and the vehicle types were classified into "autos," "medium trucks," and "heavy trucks."

The FHWA traffic-noise prediction model (STAMINA 2.0) was used to quantify noise levels that would be caused by project-generated traffic at each sound-level measurement location. Predictions of the noise levels were modeled for 2020 (the design year) with and without the project. Traffic engineering data on vehicle volumes, the proportion of passenger cars and trucks, and typical vehicle speeds were used in the modeling of future conditions. For receptor locations that have an interior Noise Abatement Criteria level one must demonstrate compliance by examining the building envelope and estimating its ability to reduce noise levels.

The modeled noise levels for each receptor were compared to the appropriate Noise Abatement Criteria level. A traffic-noise impact occurs when the modeled noise levels approach or exceed (i.e., equal to or greater than 66 dBA) the FHWA Noise Abatement Criteria or when predicted traffic-noise levels substantially exceed existing noise levels. Locations determined to be impacted by traffic-noise levels are considered for traffic-noise abatement. Potential abatement alternatives are then reviewed for feasibility and reasonableness.

Affected Environment

To place the discussion of noise regulations, study methodology, and existing conditions into context, the following section describes how noise is characterized.

Characterization of Noise

Noise is defined as excessive or undesired sound. Human sensitivity to sound depends on its intensity, frequency, composition, and duration. Noise intensity is measured on a logarithmic scale in units termed decibels (dB). The scale is logarithmic because a wide range of sounds is audible to the human ear. On this scale, an increase of 10 dB is perceived as a doubling of apparent loudness. For example a 70-dB noise level sounds twice as loud as a 60-dB noise level. In the outside environment, such as near roads, a change of 3 dB is just noticeable to most people, while a 5-dB change is noticeable under typical listening conditions.

Because the scale used to measure noise is logarithmic, a doubling of a noise source's strength, such as caused by twice as much traffic on a road, produces a 3-dB increase in average roadway noise. Such an increase would not be perceived as a doubling in noise loudness, which requires a 10-dB increase. Sound levels caused by traffic decrease at a rate of between 3 and 4.5 dB when the distance from the road is doubled, depending on the type of surface (e.g., hard or soft) between the source and the receiving property. Sounds from discrete events or stationary point sources, such as an idling bus, decrease by 6 dB when the distance from the source is doubled. Conversely, halving the distance to a source increases sound levels by 3 dB and 6 dB for roadway and point sources, respectively.

When addressing how noise affects people, it is necessary to consider the sound frequency response of the human ear. The greater sensitivity of the human ear to certain frequencies is approximated by skewing (or weighting) the dB scale toward those frequencies. The weighted dB scale that best approximates the response of the human ear is known as the A-weighted scale (dBA). All sound levels in this evaluation are reported in dBA.

The magnitude of typical noises is shown in Table 3-27.

A noise descriptor known as the equivalent sound level (L_{eq}) characterizes average sound levels. The L_{eq} is the dBA level of a constant sound with the same energy as the actual fluctuating sound levels, which are measured over a given period of time. As such, the L_{eq} can be considered an energy-average sound level.

Noise Regulations

The Aurora Corridor Project would be constructed within the City of Shoreline city limits and would use local and federal funding. Consequently, both federal and local noise regulations would apply to different elements of the project. Applicable noise regulations are described below.

FHWA Guidelines

The FHWA has developed federal guidelines that govern the evaluation of noise impacts for projects that physically alter an existing highway by increasing the number of traffic through-lanes. A noise study must be conducted for these types of projects in accordance with FHWA guidelines. The purpose of the study is to determine if noise abatement is necessary to mitigate traffic-noise impacts at sensitive receptor locations. Noise mitigation would be considered only where noise impacts have been identified and if it is a cost-effective mitigation measure, as determined by current policy. Noise impacts are defined as impacts that occur when the predicted traffic-noise levels approach or exceed the noise

abatement criteria or when the predicted traffic noise levels for the design year substantially exceed existing noise levels (23 CFR 772, 1987). For projects that add lanes, the definition of traffic-noise impact applies to the total noise level rather than to just the incremental increase in noise level caused by the added lanes.

Table 3-27
Weighted Sound Levels and Human Response

Sound Source	Sound Level (dBA)	Human Response
Aircraft carrier operation	140	--
Jet takeoff (200 feet away)	120	Painfully loud
Riveting machine	110	Maximum vocal effort
Shout (0.5 feet away)	100	--
Heavy truck (50 feet away)	90	--
Busy street	80	Hearing damage with continuous exposure
Freeway traffic (50 feet away)	70	Telephone use difficult
Air conditioning unit (20 feet away)	60	--
Light auto traffic	50	Quiet
Bedroom or library	40	--
Soft whisper	30	Very quiet
Broadcasting studio	20	--
--	10	Just audible
--	0	Threshold of hearing

Source: U.S. Council on Environmental Quality, 1970

This noise analysis uses procedures, noise predication software, and impact criteria developed by FHWA. The noise analysis compares the future traffic-noise level for the Aurora Corridor Project with the No Action Alternative for the design year (2020) and with the noise criteria established by FHWA. If sound levels exceed FHWA Noise Abatement Criteria, mitigation measures would be considered to reduce noise levels if reasonable and feasible.

The FHWA Noise Abatement Criteria are summarized in Table 3-28. The noise levels are expressed in dBA hourly equivalent sound levels (L_{eqhr}). The type of land use determines which noise level criterion is appropriate (see Tables 3-29 and 3-30).

Sensitive receptors that might be affected along the proposed project are either residences or motels. These land uses are classified under FHWA Noise Abatement Criteria activity categories B and E. In a noise analysis, primary consideration is given to exterior areas because abatement is usually necessary only where frequent human use occurs and a lowered noise level would be of benefit. However, some receptor locations along Aurora

Avenue North do not have exterior activities that would be affected by traffic noise. Therefore, the interior criterion, FHWA Activity Category E, is applied to these areas.

Table 3-28
FHWA Noise Abatement Criteria

Activity Category	L_{eqhr}	Description of Activity Category
A	57 dBA (exterior)	Lands on which serenity and quiet are of extraordinary significance
B	67 dBA (exterior)	Residences, motels, schools, churches, parks, play fields, and hospitals
C	72 dBA (exterior)	Developed lands not included in A or B
E	52 dBA (interior)	Residences, motels, schools, libraries, hospitals, and auditoriums

Source: FHWA Traffic Noise Abatement Criteria (23 CFR Part 772)

Washington State Department of Transportation

WSDOT is responsible for applying federal (FHWA) regulations to state highway projects. WSDOT has developed the definitions essential to performing highway noise studies. WSDOT guidance states that noise impacts begin to occur when project noise levels reach to within 1 dBA of FHWA standards. Substantial impacts are defined as levels 10 dBA greater than existing levels. WSDOT's policies are set in the reference text *Noise Abatement Policy and Procedures* (WSDOT, 1997).

City of Shoreline

The City of Shoreline has not developed a noise control chapter for its Zoning Code that addresses roadway noise not associated with construction activities. Under SMC 9.05.010(8) the hours of construction are limited to 7:00 a.m. to 10:00 p.m. on weekdays and 9:00 a.m. to 10:00 p.m. on weekends. State regulations contained in Chapter 173 WAC would be the governing regulations for controlling noise from construction activities.

Existing Conditions

Specific sound-level measurement locations were identified for land uses that would be compared to FHWA activity categories to determine the type of Noise Abatement Criteria that would apply. The three identified locations were grouped into two FHWA Noise Abatement Criteria activity categories: B and E. Sound-level measurement location S-1 falls under the FHWA Category B Noise Abatement Criteria. FHWA Type E Noise Abatement Criteria would apply to sound-level measurement locations S-2 and S-3, which consist of land uses that do not have outdoor activities. Table 3-29 presents a description of each sound-level measurement location.

The locations of the sound-level measurements are shown in Figure 3-4. Table 3-30 provides the corresponding FHWA Noise Abatement Criteria for each measurement location.

Table 3-29
Sound-Level Measurement Locations

Receiver Location	Description
S-1	Located adjacent to a residential property at 15557 Midvale Street, approximately 125 feet east of Aurora Avenue. Sound levels at this site are typical of those experienced by about 10 residential properties.
S-2	Located on commercial property (the Shoreline Inn) at 16526 Aurora Avenue, 38 feet east of Aurora Avenue. Sound levels at this site are typical of those experienced by about 10 motel units. There are no outdoor public use areas at this site.
S-3	Located on commercial property at 14817 Aurora Avenue North (the Quest Inn), 66 feet west of the southbound lanes of Aurora Avenue North. Sound levels at this site are typical of those experienced by two motel rooms. There are no outdoor public use areas at this site.

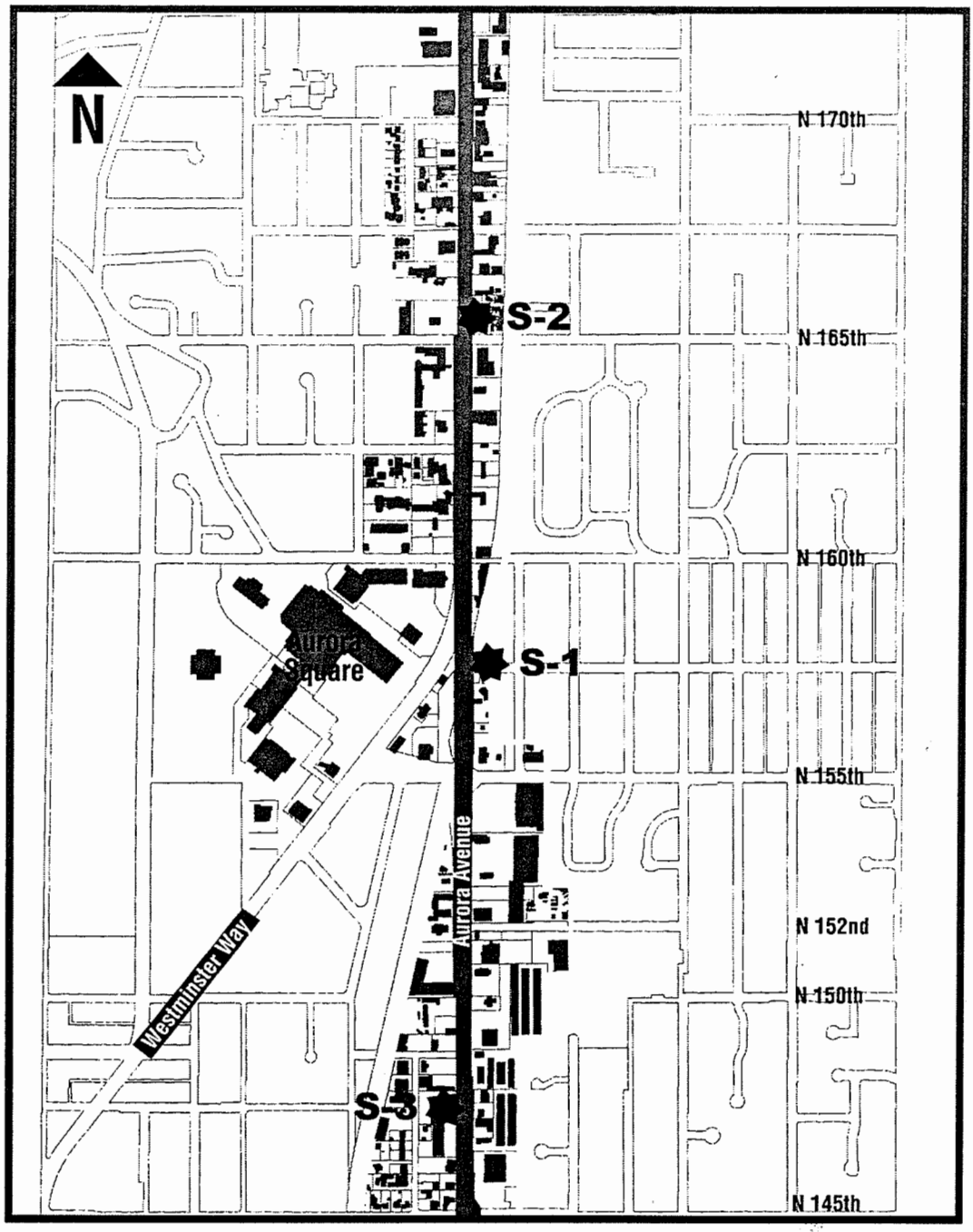
Table 3-30
Applicable FHWA Noise Abatement Criteria

Sound-Level Measurement Location	L_{eqhr}	Description of Activity Category
S-1	67 dBA (exterior)	**Activity Category B**: Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences (exterior) motels, schools, churches, libraries, and hospitals
S-2	52 (interior)	**Activity Category E**: Residences, motels, schools, churches, parks, play fields, hospitals, and auditoriums
S-3	52 (interior)	**Activity Category E**: Residences, motels, schools, churches, parks, play fields, and hospitals

Source: FHWA Traffic Noise Abatement Criteria (23 CFR Part 772)

The selected sites, located on residential or commercial property close to Aurora Avenue North, would potentially be affected by the project.

To determine 2000 baseline noise levels, sound levels were measured at the receptor sites that would be most sensitive to noise increases from the proposed project. This project would impact local noise levels because transit traffic and right-turning traffic would be one-lane width closer to adjacent commercial and residential property than they currently are. A series of three short-term (15-minute) measurements were taken before or during the p.m. peak period (4:30 p.m. to 6:30 p.m.). The calibration of the meter was checked before and after the measurements. Traffic counts were taken simultaneously with the noise measurements to calibrate the FHWA noise model. The roadways were dry and winds were light during the measurements. The short-term sound-level measurement locations were selected as locations for future noise predictions ("receiver sites") in the STAMINA model. The results of the noise sampling are presented in Table 3-31.



LEGEND

Location of Noise Measurement

CITY OF SHORELINE

Aurora Avenue North Multimodal Corridor Project:
North 145th Street to North 165th Street

Figure 3-4
Location of Noise Measurements
N 145th Street to N 165th Street

Table 3-31
Comparison of 2000 p.m. Peak L_{eq} Measured and Modeled Noise Levels (dBA)

Receiver	2000 Measured	2000 Modeled	Differential	Hourly Vehicle Volumes During Measurement					
				Northbound			Southbound		
				Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
S-1	59.6	59.2	-0.4	1,712	40	20	1,104	24	4
S-2	68.5	68.9	+0.4	2,020	28	8	1,300	28	12
S-3	65.3	65.4	+0.1	1,820	20	4	1,276	28	12

Note: Medium trucks are trucks with two axles and dual rear tires (a total of six tires); heavy trucks are trucks with three or more axles. Articulated transit buses are considered heavy trucks; non-articulated buses and vanpools are considered medium trucks. All measurements are for outdoor locations.

Table 3-31 shows the measured and modeled sound levels and indicates the volume of traffic during the measurement period. It is good modeling practice to determine the magnitude of background noise and shielding effects by modeling the current conditions using traffic volumes counted during the noise measurement and then comparing the modeled results to onsite measurements. Background noises or shielding effects measured this way can be manually entered into the model to duplicate the measured sound levels. STAMINA is considered to be adequately calibrated when the modeled levels using concurrent traffic counts are within 2 dBA of the measured values.

Measured or modeled noise levels are rounded to the nearest whole dBA for comparison with noise abatement criteria levels. Table 3-31 indicates that noise at the location of Receiver S-2 currently exceeds the FHWA Noise Abatement Criteria of 67 dBA for outdoor public use areas.

Environmental Consequences

Construction Impacts

During construction, sound levels would temporarily increase near construction sites due to the use of heavy equipment and the transport of construction materials. As shown in Table 3-32, noise levels generated during construction vary widely, reflecting the great variety of equipment used during construction. At times, some equipment might not operate or might sit with engines idling for long periods of time. However, at other times, several pieces of the equipment might operate simultaneously. Both of the build alternatives would use similar equipment during the construction phase and would have similar impacts.

Operational Impacts

No Action Alternative

The noise impacts of the No Action Alternative are derived from the forecast traffic along Aurora Avenue North for 2020 as shown in Table 3-33. Under the No Action Alternative, traffic noise is predicted to increase slightly at Receivers S-1 and S-3. No increase is expected at Receiver S-2.

Table 3-32
Noise Levels of Typical Construction Equipment

Equipment	Typical Sound Level (dBA) (at a distance of 50 feet)
Paver	89
Dump truck	88
Jackhammer	88
Scraper	88
Bulldozer	87
Concrete mixer	85
Air compressors	81

Source: Alfredson & May, 1978

Alternative A

To evaluate whether or not noise abatement should be considered, FHWA's STAMINA model was used to predict noise levels at each sound-level measurement location. The results of the noise modeling analysis for future background levels (the No Action Alternative levels) and the proposed project levels for 2020 (project design year) are presented in Table 3-33. The modeling accounts for the addition of northbound and southbound lanes for transit and right-turn vehicles.

Sound-level measurement locations listed in Table 3-33 represent sensitive receptors that might be affected by the project. For all three receiver locations, the predicted exterior noise levels were obtained for 2020 . Depending on the type of sound-level measurement location, various FHWA Noise Abatement Criteria would apply.

As shown in Table 3-33, predicted noise levels at sound-level measurement Receiver S-1 were compared to the FHWA Activity Category B (exterior). Predicted 2020 exterior noise levels were obtained for sound-level measurement Receiver S-1 to determine noise levels near affected residences. Table 3-33 indicates that the predicted exterior noise levels for 2020 do not increase above future No Action Alternative levels.

For sound-level measurement Receivers S-2 and S-3, predicted 2020 exterior noise levels were obtained for the highway-facing walls of motel rooms. Normally, only outdoor areas of frequent human use are considered for noise abatement; however, predicted 2020 interior noise levels were provided for Receivers S-2 and S-3 because there are no outdoor activities

for these sound-level measurement locations. Therefore, the FHWA Category E Noise Abatement Criteria are the governing criteria for these sound-level measurement locations. Table 3-33 provides interior sound levels for the FHWA Criteria Type E sites (Receivers S-2 and S-3). Compliance with the Interior Noise Abatement Criteria of 52 dBA is determined by examining the building and estimating its ability to reduce noise levels. The most important factors are the percentage of the walls used for windows, the type of windows (single-pane or double-pane), and wall construction details (masonry or wood frame). All the motels have double-pane windows with a small percentage of wall area in glass. Wall construction was either masonry (at Receiver S-2) or wood frame (at Receiver S-3). This type of construction will achieve a 25 dBA reduction in noise levels for both locations (23 CFR Part 772, 1982). Interior sound levels were obtained for these two locations by subtracting 25 dBA from the modeled 2020 exterior noise level. As shown in Table 3-33, noise at these locations does not exceed the Interior FHWA noise criteria of 52 dBA.

Table 3-33
2020 Predicted p.m. Peak L_{eq} Noise Levels (dBA)

Receiver	2020 No Action	2020 with Project—Exterior Noise Levels	Project Effect	FHWA Category B	Substantial Increase >10 dBA	2020 with Project—Interior Noise Levels	FHWA Category E
S-1	61	61	0	67	No	--	--
S-2	69	69	0	N/A	No	44	52
S-3	67	67	0	N/A	No	42	52

Alternative B

Alternative B would have traffic volumes and sensitive receiver locations identical to those of Alternative A. The distances between vehicle lanes and sensitive receivers would also be the same. Consequently, Alternative B would have noise impacts identical to those discussed previously for Alternative A.

Secondary and Cumulative Impacts

There are no identified secondary noise impacts caused by these proposed improvements.

Cumulative impacts associated with planned improvements to the Aurora corridor north of the Aurora Corridor Project have been accounted for in the traffic modeling used as the basis for determining noise impacts. There are two other projects in the Aurora Corridor Project area that have the potential to increase noise in the area. One project is the Interurban Trail, a hiking-biking trail that will be adjacent to Aurora Avenue North. Because no motorized vehicles will be allowed on the trail, there will not be any substantial noise impacts from it to any sensitive receivers, although trail users might make sounds. Therefore, it was determined that the Interurban Trail would not add to cumulative noise impacts. Additional improvements to Aurora Avenue North northward from North 165th Street to North 205th Street are similar in concept to those of the Aurora Corridor Project. An examination of the entire Aurora corridor from North 145th Street to North 205th Street showed that noise along the portion from North 165th Street to North 205th Street would not have a substantial impact on sensitive receivers.

There are several noise-sensitive properties adjacent to Aurora Avenue North between North 165th Street and North 205th Street. These sensitive properties are described in Table 3-34 and shown in Figure 3-5.

Table 3-34
Sound-Level Measurement Locations and Existing Noise Levels

Receiver Location	Description
S-4 67 dBA	Located on residential property at 19250 Aurora Avenue North (Holiday Trailer and Mobile Park), about 175 feet east of Aurora Avenue North. Sound levels at this site are typical of those experienced by four mobile homes.
S-5 64 dBA	Located on residential property, 158 feet west of Aurora Avenue North, just north of North 200th Street. Sound levels at this site are typical of those experienced by about five residential units in one condominium building.
S-6 72 dBA	Located on commercial property at 19527 Aurora Avenue North (Days Inn). Sound levels at this site are typical of those experienced by two motel rooms. There are no outdoor public use areas at this site.
S-7 65 dBA	Located on commercial property at 17839 Aurora Avenue North (Ronald United Methodist Church). Sound levels at this site are typical of those experienced by patrons of this church.

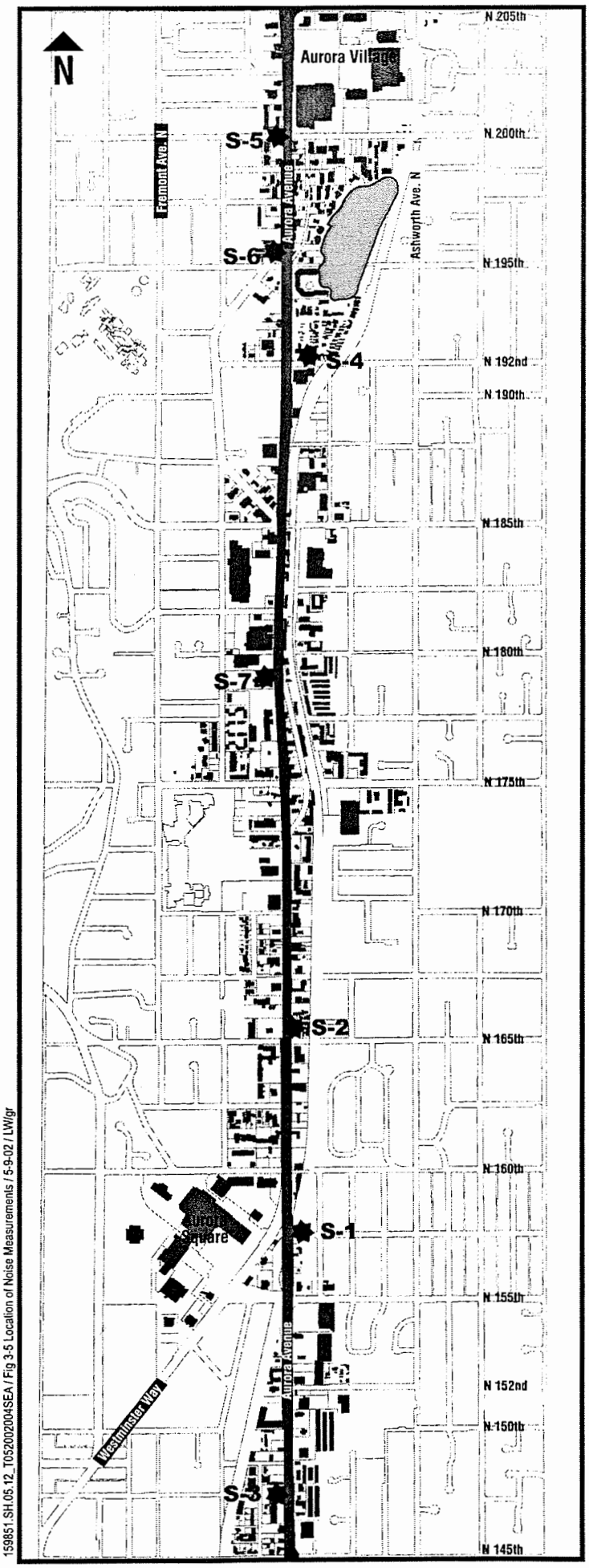
The effect of redesigning Aurora Avenue North from North 165th Street to North 205th Street on the noise levels at these sensitive sites was determined for 2020 (the design year). The results of the noise analysis are shown in Table 3-35.

Table 3-35
2020 Predicted PM Peak L_{eq} Noise Levels (dBA)

		Exterior Levels		Interior Levels			
Site	No Action	Project in 2020	FHWA Category B	Project in 2020	FHWA Category E	Project Effect	Substantial Increase >10 dBA
S-4	68	68	67	N/A	N/A	0	No
S-5	64	64	67	N/A	N/A	0	No
S-6	73	73	N/A	48	52	0	No
S-7	62	63	67	N/A	N/A	1	No

Note: Interior noise levels are calculated by deducting 15 dBA (a low estimate of the sound buffering capability of the building's walls) from the modeled exterior noise levels.

The results of the STAMINA modeling indicate that only at Receiver S-4 (within the Aurora corridor from North 165th Street to North 205th Street) did the noise equal or exceed the FHWA Noise Abatement Criteria. The results of the STAMINA modeling indicate that sound-level measurement location S-4 should be considered for noise abatement because the predicted 2020 noise level exceeds the FHWA Noise Abatement Criteria of 67 dBA. Typical types of abatement to be considered after application of the cost-effectiveness criteria are:



LEGEND

Location of Noise Measurement

CITY OF SHORELINE

Aurora Avenue North Multimodal Corridor Project:
North 145th Street to North 165th Street

Figure 3-5
Location of Noise Measurements N 145th Street to N 205th Street

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- Traffic management measures, such as traffic-control devices, prohibition of certain vehicle types, time/use restrictions for certain vehicle types, and modified speed limits
- Change of alignment, either vertical or horizontal
- Construction of noise barriers

As the future improvements to Aurora Avenue North from North 165th Street to North 205th Street are designed, it is likely they would incorporate some of the above options as part of the project design. For example, traffic management measures and changes to the roadway alignment would occur with the project to achieve a system that supports pedestrian safety and substantially improves transit operations and appearance of the streetscape over existing conditions.

Mitigation Measures

Mitigation measures are discussed in terms of construction impacts and operational impacts.

Mitigation of Construction Impacts

Construction noise can be reduced with properly sized and maintained mufflers, engine-intake silencers, and engine enclosures, and by turning off idle equipment and confining activities to daytime hours. Daytime hours are defined in the City of Shoreline's Municipal Code (9.05.010(8)) as 7 a.m. to 10 p.m. on weekdays and 9 a.m. to 10 p.m. on weekends. Stationary equipment could be placed as far away from sensitive receptor locations as possible. Where this is infeasible, or where noise impacts are still substantial, portable noise barriers could be placed around the equipment with the opening directed away from the sensitive receptor property. These measures are especially effective for stationary engines used in pumps, compressors, welding machines, and similar equipment that operate continuously and contribute to high, steady background noise levels.

Although back-up alarms are exempt from the Washington noise ordinance, they are among the most annoying sounds from a construction site. Where feasible, equipment operators could drive forward rather than backward to minimize this noise. Requiring operators to lift rather than drag materials wherever feasible could also reduce the noise generated from material handling. Backup beepers could also be disabled and replaced with human spotters.

If construction must occur at night to avoid conflicts with traffic on Aurora Avenue North then a noise variance must be obtained from the City of Shoreline.

Mitigation of Operational Impacts

The results of the STAMINA modeling indicate that none of the sound-level measurement locations qualify for noise abatement because the predicted noise levels do not exceed the FHWA Noise Abatement Criteria of 67 dBA for exterior uses or 52 dBA for interior uses.

Methodology

The Water Quality/Surface Water analysis includes a discussion of the affected stream basins and a description of the proposed stormwater treatment facilities and BMPs that are planned to minimize the impact of stormwater runoff from construction of the Aurora Corridor Project. A full description of the analysis and the regulations that guide the design is provided in the Water Quality/Surface Water Discipline Report.

Project Action Area

Representatives from WSDOT, the City of Shoreline, and CH2M HILL met on June 2, 2001 to clarify the size of the action area. The action area was determined to be surface water and aquatic environments: Boeing Creek at its open-channel receiving waters near Carlyle Road, the northwestern-most tributary swale of Thornton Creek, and a general consideration of the stormwater contributions to the West Lake Washington (Densmore) Basin. The Aurora Corridor Project action area is situated at the headwaters of all the basins in the highly urbanized section of the City of Shoreline.

Review of Information

The first task was to identify which drainage basins would be affected by the stormwater runoff from the proposed project area under each alternative. The City's geographic information system (GIS) database and USGS topographic maps were used to evaluate the surrounding topography and delineate drainage basins. Additional reports from the drainage basins were also reviewed. Topographic maps were used in the field to further delineate drainage basins. Survey base maps for the Aurora corridor and existing as-built drainage plans were also used to assess the existing stormwater drainage network and sub-basin drainage areas.

The second task was to determine how the proposed improvements under each alternative would change the amount of the impervious and pervious surfaces within the project footprint. Aerial photographs overlayed with the proposed design layout and field reconnaissance surveys were used to assess the changes in pervious and impervious surfaces. Changes in the types of surfaces ultimately affect the quality and quantity of surface water runoff from the project area. The stormwater drainage improvements proposed for this project, which include treatment and detention facilities, were selected and designed based on the guiding regulations described below.

Impact Criteria

The effects of the proposed action for both build alternatives would be considered to have substantial impacts if it would result in a measurable change in the flow and water quality of the receiving stream that could potentially: (1) cause direct mortality to fish, (2) degrade existing habitat in a way that limits the propagation of the species, or (3) exacerbate existing

conditions that are known to limit fish population or habitat. These types of impacts primarily would result primarily from construction and operational activities that could lead to erosion/sedimentation issues, increase peak flow rates and base flows, hazardous spills to water bodies, habitat disturbance, or recreational fishing pressure. The following section discusses the various regulations that guide the design of stormwater treatment and detention facilities that are necessary to minimize the effects of the proposed designs.

Regulations

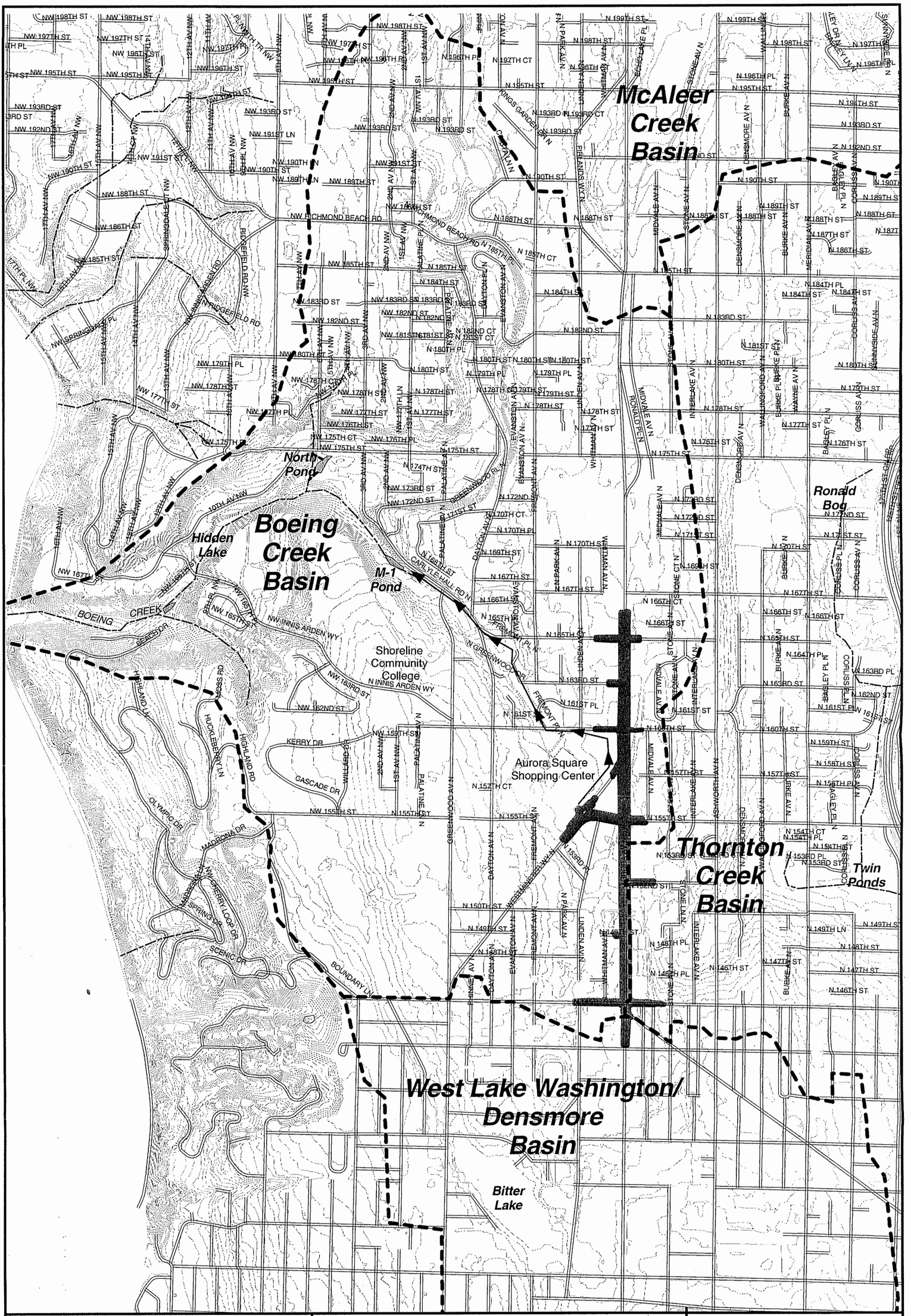
The stormwater drainage facilities and the erosion and sediment control best management practice (BMP) measures for this project would be selected and designed based primarily on the City of Shoreline regulations. The City uses the 1998 King County *Surface Water Design Manual* (SWDM) (King County, 1998) as modified by the City's June 2000 Development Code. The Development Code requires a project to include stormwater quantity control facilities if the project will add 1,500 square feet or more of impervious surfaces. The Development Code also requires a project to include stormwater quality treatment facilities if the project will add or replace 1,500 square feet or more of pollution-generating impervious surfaces (PGIS). Roads are pollution-generating impervious surfaces.

Because the project area extends approximately 600 feet south of North 145th Street into the City of Seattle city limits, the City of Seattle's municipal codes for flow control and stormwater treatment also must be met. There are also other sources of stormwater and erosion and sediment control regulations that must be met. These include the ESA requirements administered by the National Marine Fisheries Service (NMFS) and U.S Fish and Wildlife Service (USFWS), the requirements for obtaining (if necessary) a Hydraulic Project Approval (HPA) from the Washington State Department of Fish and Wildlife (WDFW), and the requirements of the National Pollutant Discharge Elimination System (NPDES) for stormwater discharges associated with construction activities, which is administered by the Washington State Department of Ecology (Ecology).

The proposed detention, water quality and erosion control BMPs will meet the requirements of the City of Shoreline Development Code, King County *Surface Water Design Manual*, NPDES, and will satisfy the Protective Design Level requirements for the ESA. Descriptions of the BMPs that will be included as part of the project design to satisfy the regulations are described in the Operational Impacts and Mitigation Measures sections of this report.

Affected Environment

The Aurora Corridor Project lies within two watersheds: the Lake Washington–Lake Sammamish watershed and the middle-interior Puget Sound marine system watershed. The Lake Washington–Lake Sammamish watershed is identified as WRIA 8 in the *Washington Streams and Salmon Utilization Catalogue* (Williams, 1975). Stormwater runoff from the roadway drains to three basins: (1) the Boeing Creek, (2) the Thornton Creek, and the (3) West Lake Washington (Densmore). Boeing Creek discharges to the marine environment of Puget Sound, and Thornton Creek flows directly into Lake Washington. The West Lake Washington (Densmore) Basin includes drainage to Green Lake, which ultimately discharges to Lake Union. Figure 3-6 shows the affected drainage basins for the Aurora



CITY OF SHORELINE

Aurora Avenue North Multimodal Corridor Project:
North 145th Street to North 165th Street

LEGEND

- Drainage Basins
- 48" Storm Drain
- Aurora Corridor Project Limits
- Roads
- Streams
- Contours

N
W E
S

SCALE
0.1 0 0.1 0.2 0.3 Miles

Figure 3-6

Surface Water Features

Corridor Project, as well as drainage features and the extent of the proposed roadway improvements.

The majority of stormwater from the area of the Aurora Corridor Project is collected and conveyed in a storm drainage system to Boeing Creek (see Figure 3-6). There are two areas within the proposed project limits where stormwater runoff drains to Thornton Creek. These two areas are the proposed redevelopment of North 152nd Street and North 145th Street east of Aurora Avenue North (see Figure 3-6). A portion of these streets will be redeveloped as part of the overall project. The only other area that is not in the Boeing Creek Basin is a small section of Aurora Avenue North that will be redeveloped south of North 145th Street. Stormwater runoff drains into the West Lake Washington (Densmore) Basin, as shown in Figure 3-6. This area is within the City of Seattle city limits. Approximately 450 feet of redeveloped roadway as part of the Aurora Corridor Project (from the extreme southern end of the project up Roosevelt Avenue) drains to this basin.

Most of the parcels adjacent to Aurora Avenue North in the project area have been developed with commercial businesses. As a result, the adjacent area is covered primarily with impervious surfaces (i.e., pavement and sidewalks), and there are few vegetated areas immediately adjacent to the roadway.

A detailed subsurface geotechnical investigation has not yet been completed for the Aurora Corridor Project. Soils maps show that there are primarily Alderwood Type C – Till soils in the project area, which have very low infiltration rates. The low infiltration rates limit the use of infiltrating facilities for treatment of stormwater runoff. Locations of the proposed water quality and detention systems, most of which will be underground structures (at North 155th Street, North 160th Street, North 152nd [Thornton], and Roosevelt [West Lake Washington-Densmore]), have not been identified as having problems with high groundwater; therefore, groundwater should not be a concern.

Boeing Creek

Boeing Creek is a tributary system that drains into Puget Sound north of the City of Seattle and south of the City of Edmonds. It is approximately 1.35 miles long and drains an 800-acre basin that is 90 percent developed (City of Shoreline, 1997). Stormwater runoff from Aurora Avenue North starting just north of North 183rd Street and extending south to North 145th Street is to the 48-inch-diameter storm drain just north of Aurora Square that extends generally northwest along 160th Street, Fremont Place, and Carlyle Hall Road (see Figure 3-6). The enclosed pipe system goes through the developed area and continues along the northeastern boundary of the Shoreline Community College. The storm drain eventually discharges to an open channel southwest of the intersection of Carlyle Hall Road and Greenwood Avenue North. This open channel is the beginning of Boeing Creek. From there Boeing Creek flows generally west to a detention pond (M-1 Pond).

Most of the existing land use within the basin is single-family residential with most commercial areas concentrated along Aurora Avenue North. Shoreview Park and Shoreline Community College are located within this basin. Due to the highly urbanized nature of the surrounding watershed and the associated high percentage of impervious areas, peak stormwater discharges in the upper portions of the basin have increased relative to natural conditions, causing increases in streambank erosion and in the amount of sediment

transported downstream (King County, 1994). Although the majority of the basin is urbanized, the series of newly constructed and retrofitted retention/detention ponds have lessened the impact from storm event flows that previously contributed to erosion of the streambanks and caused streambeds to fill with sediment.

Water quality indicators other than sediment are generally good. Boeing Creek is not listed under the State's 303(d) list of impaired waters. Water quality in Boeing Creek was measured at six locations in July 1979, during low-flow conditions (Brown and Caldwell, 1979). Parameters measured included temperature, dissolved oxygen, conductivity, oil and grease, fecal coliform, total phosphate, and nitrate and nitrite. The water quality was generally good; only fecal coliform was noted as exceeding state water quality standards for Class AA waters (at four of the six sampled locations).

Chinook salmon are not found in Boeing Creek (Hennick, pers. comm., September 25, 2000). Coho and chum salmon have been found in the creek downstream of the irrigation dam for the Seattle Golf Club course. Several programs have introduced coho salmon eggs and juveniles into the reach of Boeing Creek between the M-1 Pond and Hidden Lake. Cutthroat trout also are found in the creek (Boehm, 1994).

A basin-wide planning-level effort for Boeing Creek watershed is currently under way. Through this planning-level effort the City is identifying concepts for further consideration as capital and/or maintenance projects to achieve basin-wide improvements. Concepts might include improvements to the North Pond or the M-1 dam, replacing the existing manhole at North 160th Street and Fremont Avenue with a new control structure, or installing a detention facility within a portion of Westminster Way right-of-way.

Thornton Creek

The mainstem of Thornton Creek flows southeast from the Twin Ponds, located approximately 0.75 mile west of Aurora Avenue North, is eventually piped under Northgate Mall, and then flows southwest to enter Lake Washington near Matthews Beach. The Thornton Creek mainstem is approximately 5.7 miles long, with an additional 12 miles of tributaries (Williams, 1975). Thornton Creek drains a watershed of approximately 7,200 acres (Dorothy Craig and Associates, 2000). The watershed is extensively urbanized.

There are two small areas where stormwater runoff from the proposed project improvements would drain to Thornton Creek: North 145th Street and North 152nd Street. The redevelopment areas proposed for both North 152nd Street and North 145th Street (including some of the intersection area) are located within the Thornton Creek Basin. Stormwater runoff from these two areas flows to Thornton Creek's northwestern-most tributary (see Figure 3-6). This tributary is an intermittent-flow channel, which may be characterized as a wet, heavily vegetated swale with limited channel characteristics. This tributary flows into Twin Ponds. Flow from Ronald Bog is also conveyed to Twin Ponds.

The Watershed Characterization Report (Dorothy Craig and Associates, 2000) indicates that although chinook and coho salmon have been found in Thornton Creek, only minimal numbers of these fish return to spawn when compared to the numbers that returned to spawn historically. This report updates the assessment by Williams (1975), in which coho salmon were identified as using Thornton Creek. King County salmon distribution maps (King County, 2001) indicate that both chinook and coho use the lower reaches of Thornton

Creek. According to these maps, both species are found below the confluence of Maple Leafs Creek and Thornton Creek. Trout (cutthroat and steelhead/rainbow) were also identified as being found in the creek (Dorothy Craig and Associates, 2000). This finding is supported by King County salmon distributions, with the exception that no steelhead trout are known to use Thornton Creek (King County, 2001). However, because there have been many historical issues pertaining to environmental degradation of the Thornton Creek watershed, it is considered to fall under the regulatory requirements of the ESA.

West Lake Washington (Densmore) Basin

As described previously, the redevelopment for Aurora Avenue North under both build alternatives will extend approximately 600 feet south of North 145th Street into the City of Seattle city limits. The section of the roadway from Roosevelt Way to the project limits (approximately 450 feet) is located within the West Lake Washington (Densmore) Basin, as shown in Figure 3-6. Stormwater runoff from this area of the Aurora Corridor Project presently flows southeast and is conveyed by stormwater pipes along Roosevelt Way toward Stone Avenue (see Figure 3-6). From there, stormwater is conveyed by a series of pipes south toward Green Lake, generally paralleling Aurora Avenue North. Upstream of Green Lake, the pipes discharge to a King County Department of Metropolitan Services storm drain that discharges into Lake Union.

Environmental Consequences

Construction Impacts

During construction, accidental or inappropriate discharge of sediment from cleared and excavated areas and/or spills of fuel, lubricants, and other construction-related hazardous material could result in these materials entering project area streams via stormwater runoff. Erosion on construction sites could also result in the movement of sediment to downstream drainage ways, surface waters, and adjacent properties. Introduction of contaminants into the streams could adversely affect aquatic communities, but the volume of such contaminants would likely be negligible barring a catastrophic event. These construction-related impacts could have an adverse effect on the aquatic environment if the project were unregulated. However, the project must meet the erosion and sediment control regulations described above, particularly the requirements in the SWDM and the NPDES regulations. As a result, the potential for erosion and transport of sediment away from the construction site should be minimized.

A stormwater pollution prevention plan would be prepared for the Aurora Corridor Project following the requirements of the General Permit for Stormwater Discharges Associated with Construction Activities. Best management practices (BMPs) would be used to reduce the erosion potential both during and after construction and to minimize the amount of sediment carried away from the construction site. The BMPs would be expected to include nonstructural as well as structural measures. The general permit also requires the preparation of a spill control plan that would be used during construction.

Note that the potential for erosion and sedimentation resulting from construction is related to the amount and location of excavation and not to the current and future impervious area.

Therefore, construction impacts under Alternative A could potentially be slightly greater than those under Alternative B because the project area footprint of Alternative B is smaller than that of Alternative A. However, with proper use of BMPs, impacts under either alternative should be minimal. There would be no construction impacts under the No Action Alternative.

Operational Impacts

Change in the amount of impervious surface area draining to adjacent waterways is a major factor in determining the impacts of roadway projects. There are two types of effects that result from changes to impervious surface area: hydraulic effects and water quality effects. Hydraulic effects, such as stream channel scour that could affect habitats, are not a factor in the Aurora Corridor Project area because the project design components would result in relatively little change in the volume of stormwater entering the creeks. Both build alternatives are expected to result in small water quality improvements in the project area.

The stormwater detention and quality treatment facilities proposed for the two build alternatives were identified based on the City of Shoreline regulations and on meeting ESA no impact requirements. The proposed stormwater facilities for each of the basins under both build alternatives are designed to meet the regulations that relate to the net changes in the creation or deletion of overall impervious surfaces. Most of the existing project area is covered with impervious surfaces, primarily pavement and sidewalks. The proposed post-project condition would also be mostly impervious for both Alternatives A and B. However, the project does include vegetated medians in the roadway for Alternatives A and B and vegetated planter strips adjacent to the sidewalks for Alternative A.

Under the No Action Alternative, there would be no change in pervious and impervious surfaces from current conditions. Under Alternative A, there would be an overall decrease in new impervious surfaces with the construction of Alternative A (due to the vegetated medians and sidewalk amenity zones), However, under Alternative B, there would be an overall increase in new impervious surfaces, primarily because there would not be a vegetated amenity zone. Under each alternative, relative increases or decreases in new impervious surfaces within each basin and the required stormwater detention and/or treatment facilities is described in the following sections.

No Action Alternative

If the project is not constructed, there would be no change in impervious area in the Boeing Creek, Thornton Creek, and West Lake Washington (Densmore) Basins, and, therefore, no change in stormwater runoff volume. In addition, no stormwater treatment or special oil-control facilities would be constructed, and the pollutant load in the stormwater runoff transported to the receiving waters would continue. Thus, the current impacts to the aquatic environment would continue, with water quality impacts remaining the predominant concern.

Alternative A

Table 3-36 summarizes the net change in pervious and impervious surfaces for each drainage basin under Alternative A. The proposed project under Alternative A would result in an increase in the amount of impervious surface in the Boeing Creek Basin by

approximately 9,800 square feet. Because there would be an increase of more than 1,500 square feet of new impervious area in the Boeing Creek Basin, stormwater quantity facilities (i.e., detention facilities) will be required in accordance with the Shoreline Development Code. These facilities most likely be underground detention vaults near the intersections of North 155th Street and Aurora Avenue North and of North 160th Street and Aurora Avenue North.

There is expected to be a decrease in impervious surfaces in the West Lake Washington (Densmore) Basin, as shown in Table 3-36. Because this area is in the City of Seattle city limits, the City's municipal code might require stormwater runoff to be routed through a detention facility prior to release into the City of Seattle stormwater drainage system. This facility would most likely be an underground detention vault at the intersection of Roosevelt Way and Aurora Avenue. In the Thornton Creek Basin, there is expected to be a slight increase of impervious areas, as shown in Table 3-36. The increase occurs at North 152nd Street because the proposed plan calls for widening of parts of the street and the addition of sidewalks. Although the increase is less than 3 percent of the existing impervious project area in the basin (1,100 square feet), and also less than the regulatory threshold for requiring flow control (1,500 square feet), stormwater detention facilities will be included as part of the project design to prevent further degradation of the Thornton Creek Basin.

Table 3-36
Impervious Areas—Alternative A

Basin	Existing Impervious Area (square feet)	Proposed Impervious Area (square feet)	Net Change in Impervious Area (Proposed – Existing) (square feet)
Boeing Creek	812,400	822,200	9,800
Thornton Creek	38,000	39,000	1,100
West Lake Washington	18,000	15,400	–2,600

The various regulations require that redevelopment projects provide stormwater quality treatment measures for the runoff from all pollutant-generating surfaces within the project limits. Alternative A would include installation of stormwater quality treatment facilities to treat the runoff from all of the road surfaces in the project area in each of the three basins. These facilities would be sized to treat the required storm flow volumes from the new and redeveloped pollutant-generating impervious surfaces in the basins. Stormwater treatment would most likely be provided by using manufactured stormwater treatment devices such as vortex or gravity-type separators or vaulted stormwater filtering systems to provide water quality treatment for the project areas. Pending final design, the City may also use underground treatment vaults or other WSDOT-approved mechanisms to achieve the necessary stormwater treatment and detention standards. In addition to these stormwater treatment facilities, there are two intersections within the project area that have or would have traffic volumes high enough to require special oil-control facilities as required in the regulations. These include the intersections of Aurora Avenue North with North 145th

Street and North 155th Street. Maintenance of the oil-control facilities would be handled by King County under contract with the City of Shoreline. King County maintenance workers have indicated that while the oil/water separators are not difficult to maintain, one of the gates in the separator tends to have a failure problem. They have been in the process of retrofitting all of these separators before the breakdown occurs to avoid flooding problems.

Because runoff from the existing road is not currently treated, implementation of the SWDM requirements for stormwater quality treatment should result in a substantial decrease in the pollutant load carried by the stormwater runoff from the roadway to the receiving waters, and subsequently improve the overall water quality in Boeing Creek. This is due primarily to the sizeable footprint of the project within the Boeing Creek Basin, and the fact that there are no stormwater quality treatment facilities for runoff from the roadways under existing conditions. The installation of stormwater quality treatment facilities in the Thornton Creek and West Lake Washington (Densmore) Basins might provide a slight improvement in the water quality of the receiving streams, but because the redevelopment area subject to treatment requirements is relatively small, the improvements are not expected to be discernible.

Alternative B

Table 3-37 summarizes the net change in pervious and impervious surfaces for each drainage basin under Alternative B. The existing areas are smaller than those under Alternative A due to the reduction in size of the overall project footprint.

As indicated previously, the proposed project under Alternative B would result in an overall increase in the amount of impervious surfaces. Within the Boeing Creek Basin, the increase is expected to be approximately 29,500 square feet. As a result, stormwater runoff volumes and peak flow rates would increase somewhat. Because there would be a net increase in impervious surfaces within the basin, stormwater quantity facilities (i.e., detention vaults) are planned for Boeing Creek. These facilities would be adjacent to the water quality treatment facilities as described under Alternative A. In the Thornton Creek Basin, there would be a slight increase in impervious surfaces within the project area (approximately 800 square feet, or 1 percent of the existing impervious project area in this basin). There would still be a net decrease in impervious surfaces in the West Lake Washington (Densmore) Basin. As under Alternative A, stormwater detention facilities (underground vaults) are planned for these two basins at the same locations described previously.

Table 3-37
Impervious Areas—Alternative B

Basin	Existing Impervious Area (square feet)	Proposed Impervious Area (square feet)	Net Change in Impervious Area (Proposed – Existing) (square feet)
Boeing Creek	769,300	798,800	29,500
Thornton Creek	39,200	40,000	800
West Lake Washington	18,000	15,400	-2,600

Stormwater quality treatment facilities would be required in each of the three basins, and the types of the facilities and the locations would be similar to those described under Alternative A. Refer to the Drawings of Alternatives for the approximate locations and layout of these facilities. The improvements in overall water quality would be similar to those described under Alternative A. Also, special oil-control facilities would be included in the design of the stormwater drainage system for the same two intersections as described under Alternative A.

Because there would be an increase in impervious surfaces within the Boeing Creek Basin, detention would be required. Although providing stormwater detention would attenuate the resulting increased peak storm flow rates and match durations (post-project to existing) for the "larger" recurrence interval storm events, there would be an unavoidable increase in total stormwater volumes discharged to the basin. Because the increase in impervious area is small (approximately 29,500 square feet, or 4 percent of the existing impervious project area in this basin), the increase in the total stormwater runoff volume should also be small. As a result, this alternative could have a slight impact on the aquatic habitat in Boeing Creek.

Secondary and Cumulative Impacts

Secondary Impacts

There are no identified secondary impacts caused by the proposed improvements.

Cumulative Impacts

Two projects—the Shoreline Interurban Trail and the future improvements along Aurora Avenue North from North 165th Street to North 205th Street—were identified as potentially having impacts in combination with those of the Aurora Corridor Project. Therefore, the potential impacts on water quality of the surface waters of each project were combined and assessed as if they were the result of one project. The Interurban Trail is presently planned to be constructed near or adjacent to Aurora Avenue North throughout most of the project area, from North 145th Street to North 165th Street. There are also improvements proposed for Aurora Avenue North from North 165th Street to North 205th Street.

From North 145th Street to just south of North 185th Street, the projects are located within the Boeing Creek Basin (except for the areas of the Aurora Corridor Project along North 145th/North 152nd and Aurora Avenue North south of Roosevelt Way, which are in the Thornton Creek and West Lake Washington (Densmore) Basins, respectively). From North 185th Street to North 198th Street, stormwater runoff from the project area flows to Echo Lake, which ultimately discharges to Lake Ballinger. From North 198th Street to North 205th Street, stormwater runoff flows to Lake Ballinger. Lake Ballinger, in turn, discharges to McAleer Creek. McAleer Creek flows into Lake Washington. Therefore, the projects from North 185th Street to North 205th Street are located in the McAleer Creek Basin.

Based on the present proposed design for the projects within the Boeing Creek Basin, the Aurora project (from North 145th Street to North 185th Street) is expected to provide a decrease in the amount of impervious surfaces by 36,000 square feet and the Interurban Trail is expected to also provide a decrease of 30,000 square feet of impervious surfaces, for a total of 66,000 square feet. Stormwater treatment facilities would be installed in the areas

of the Aurora projects to comply with federal, state, and city regulations. Because the Interurban Trail would not be considered a pollutant-generating surface, stormwater treatment of runoff from the Trail would not be required. The Interurban Trail project is presently proposing to treat runoff from a 4000-square-foot parking lot near the proposed trailhead at North 145th Street using a bioswale. Thus, the combination of reduced impervious surface and installation of stormwater treatment devices should result in improved quality of the stormwater contributions to Boeing Creek from the project corridors, creating a beneficial cumulative impact relative to existing conditions where the stormwater from the corridor is presently untreated.

Approximately 30,000 square feet of new impervious surface would be created by the combined projects in the McAleer Creek Basin that encompasses Echo Lake and Lake Ballinger, which means that detention of stormwater runoff from approximately 30,000 square feet of impervious surface would be required. Although the detention facilities would be designed to meet the requirements of the SWDM and the Endangered Species Act (ESA), both the Interurban Trail and the Aurora projects are expected to cause a small increase in the total volume of stormwater runoff in the basin.

Given the extent of the stormwater treatment facilities (e.g., bioswales, oil-water separators, and vaults) that would be required for the Aurora project, the cumulative impacts of the Interurban Trail and roadways on the water quality of the McAleer Creek Basin would not be substantial or could even be beneficial (because the Aurora project would include treatment of stormwater from the existing roadway). Because the Aurora projects and the Interurban Trail project would both be required to meet the stormwater and erosion control requirements of the City and of the ESA, the stormwater-related cumulative impacts of the two projects should be minimal. Application of BMPs and stormwater regulations would be similar among the three construction projects, and, thus, would minimize the cumulative impacts to aquatic environments. Thus, the biological integrity of the Boeing, McAleer, Thornton, and West Lake Washington (Densmore) Basins would be protected to meet City, County, and State guidelines. Neither the Interurban Trail project nor the future improvements from North 165th Street to North 205th Street extend into the Thornton Creek or West Lake Washington (Densmore) Basins; therefore, these two project will have no cumulative impact on the two basins.

Mitigation Measures

As described above, the two build alternatives would include the following stormwater and erosion control measures. Note that these measures would be included to meet current federal, state, and city regulations, so they are not considered mitigation measures. Because these measures would be included in the project, mitigation measures for stormwater and/or erosion and sedimentation impacts are not necessary.

- Measures to reduce the potential for erosion include the following:
  - Nonstructural—Disallowing soil-disturbing activities during the winter wet season; minimizing disturbed areas by clearly marking clearing and grubbing limits; and limiting the amount of area that could be disturbed at any one time.

- Temporary structural measures that might be used include silt fences, catchbasin filters, check dams, and erosion control blankets for steep slopes. Permanent measures that might be used include erosion protection for pipe inlets and outlets (e.g., riprap or concrete headwalls) and planting the pervious areas.

- Stormwater quality treatment facilities for runoff from all the pollutant-generating impervious surfaces (roadways) in the project area in the Boeing Creek Basin under both build alternatives, and detention for stormwater runoff from the new impervious areas for both build alternatives.

- Stormwater detention for the runoff from the new impervious areas and stormwater treatment for runoff from all the project area that drains to Thornton Creek under both alternatives.

- Stormwater detention and treatment for runoff from all the project area that drains to the West Lake Washington (Densmore) Basin under both alternatives.

- Special oil-control facilities at two high-use intersections (North 145th Street and North 155th Street).

No additional mitigation measures for erosion/sediment control and stormwater impacts would be used. As part of a basin-wide planning effort for Boeing Creek, additional stormwater control measures may be implemented to improve the existing conditions in the basin.

This project is being designed to be consistent with the Washington Coastal Zone Management (CZM) Plan delegated to and administered by the Washington State Department of Ecology. In accordance with the CZM policy, a final determination of compliance cannot be made until after the EA/EIS is issued and all permits are received.

Impacts to terrestrial resources are not anticipated due to the lack of vegetation in the project area and the absence of the wildlife species that such vegetation would support. Therefore, aquatic environments are the focus of this report due to the potential impacts associated with stormwater runoff.

For the Aurora Corridor Project N. 145th St. to N. 165th St. build alternatives, potential impacts would result primarily from construction and operational activities that could lead to erosion/sedimentation, hazardous spills to water bodies, or habitat disturbance. The following is a discussion of these issues relative to fisheries and aquatic resources (e.g., rivers, lakes, and ponds) and all fish species, including those protected under the ESA, which will be addressed in a No Effect Letter through a Biological Evaluation (BE) process for this project.

Methodology

The Wildlife, Fisheries, and Vegetation Section identifies potential impacts to wildlife and fisheries resources resulting from construction and operation of the Aurora Corridor Project. Impacts to terrestrial resources are not anticipated due to the lack of vegetation in the project area and the absence of the wildlife species that such vegetation would support. Aquatic environments are the focus of this report due to the potential impacts associated with stormwater runoff.

This section presents the information that was reviewed, the evaluation of field conditions, and the coordination with resource agencies that was used to prepare this discipline report.

Project Action Area

Representatives from WSDOT, the City of Shoreline, and CH2M HILL met on June 2, 2001, to clarify a number of issues including the size of the action area. The action area was determined to be aquatic environments and adjacent habitats of Boeing Creek at its open-channel receiving waters near Carlyle Road, the northwestern-most tributary swale of Thornton Creek, and a general consideration of the stormwater contributions to the West Lake Washington Basin. The Aurora Corridor Project action area is situated at the headwaters of all the basins in the highly urbanized City of Shoreline.

Review of Information

Information for this report was derived from the following sources:

- *Boeing Creek Tributary 0019, Special Study, Capitol Improvements Project No. 0A1755, General Site Survey and Level I Stream Survey Draft Report.* (Boehm, 1994)
- Telephone conversation between Doug Hennick (Washington Department of Fish and Wildlife) and Shelley Sundgren (CH2M HILL) (Hennick, 2000)
- *Basin Plan Review: 1983 McAleer Creek Project* (King County, 1987)

- *Lake Ballinger Rehabilitation Study, Recommended Plan for the City of Mountlake Terrace* (Kramer, Chin & Mao, Inc., 1977)
- *McAleer Creek Project* (KCM, 1983)
- *City of Shoreline Comprehensive Plan Draft Environmental Impact Statement Appendices* (City of Shoreline, 1997)
- *Draft Thornton Creek Watershed Characterization Report and Water Quality Assessment* (Dorothy Craig and Associates, 2000)

Evaluation of Field Conditions

CH2M HILL project biologists visited the project area in August and September 2000, and in March 2001. Land and water features were examined visually with respect to anticipated changes associated with the proposed project alternatives.

Coordination with Agencies

Information on species occurrence in the project area and species lists were obtained from the following resource agencies :

- National Marine Fisheries Service: Federal threatened or endangered species (NMFS, 1999), and subsequently updated (Clemons, 2001)
- U.S. Fish and Wildlife Service: Federal threatened or endangered species (Dethloff, 2001)
- Washington Department of Fish and Wildlife: State endangered, threatened, and sensitive species, species of concern, priority habitats (Milner, 2001)
- Washington Department of Natural Heritage: sensitive plant species and/or communities (Swope-Moody, 2001)

A Biological Assessment (BA) is currently being prepared for the Aurora Corridor Project to assess project impacts to federally listed, proposed, and candidate threatened and endangered species that potentially occur within the project area or in the vicinity of the project area. At this time, a "No Effect Letter" is being prepared to fulfill the ESA requirement for this project, after informal consultation with Washington State Department of Transportation – Environmental Affairs staff and several other state and federal resource agencies.

Affected Environment

Terrestrial Habitats

The Aurora Corridor Project is located in a highly urbanized setting in the City of Shoreline between the metropolitan area of Seattle to the south and Lynnwood to the north. Land uses adjacent to the roadway are primarily commercial, with businesses fronted by parking lots. Most of the area near the roadway is paved. Vegetation is predominantly landscape materials: ornamental and non-native trees and shrubs. Generally, vegetation in the project area offers no substantial habitat for Washington wildlife. The occurrence of mammals other

than mice, opossums, raccoons, and an occasional coyote is rare because urbanization limits available mammal habitat.

Buildings and other structures are the main habitat features for birds in the project area, although some habitat is provided by shrubs or small trees (less than 20 feet tall). Bird species that are tolerant of human disturbance and activity are the most likely residents within the corridor. Species such as pigeons, crows, and songbirds (e.g., sparrows and finches) were observed during the field investigations. Although the quality and amount of habitat increases toward the eastern and western peripheries of the Aurora Avenue North corridor; where there are residential communities, habitat occurs only in sporadic patches along creeks.

Aquatic Habitats

The Aurora Corridor Project lies within the Lake Washington–Lake Sammamish watershed and the middle-interior Puget Sound marine system. The Lake Washington–Lake Sammamish watershed is identified as WRIA 8 in the *Washington Streams and Salmon Utilization Catalogue* (Williams, 1975). Stormwater runoff from the roadway drains to three basins: Thornton Creek, Boeing Creek, and the West Lake Washington Basin (Densmore Basin). Thornton Creek flows directly into Lake Washington, whereas Boeing Creek discharges to the marine environment of Puget Sound. The West Lake Washington Basin is an urban, semi-contained basin that outlets to the Ship Canal waterway (Refer to the Water Quality/Surface Water Discipline Report for a detailed description of surface water and stormwater drainage within the project area.)

Boeing Creek

Boeing Creek is approximately 1.35 miles long and drains into an 800-acre basin that is 90 percent developed (City of Shoreline, 1997), but no portion of the creek lies nearby the Aurora Avenue North roadway. The roadway is at least 1,200 feet east of where Boeing Creek daylights at Carlyle Hall Road. Boeing Creek is listed as a Class 2 stream (WA DNR, 2000) with salmonids. There are unique areas of old-growth forest within the otherwise dense commercial zone contained within the Boeing Creek Basin (Boehm, 1994).

King County identified stormwater as a major contributor to base flows of Boeing Creek (Boehm, 1994). Stormwater runoff from Aurora Avenue North is collected and conveyed to the 48-inch-diameter storm drain at Carlyle Hall Road. Boeing Creek begins where this storm drain discharges to an open channel southwest of the intersection of Carlyle Hall Road and Greenwood Avenue North. The Boeing Creek Basin receives the majority of the stormwater generated from the Aurora Corridor Project area (Figure 3-6).

Human development within the basin has increased stormwater flows in the basin, and has caused erosion and increased bedloads that have dramatically affected aquatic habitats. Downstream of Hidden Lake, Boeing Creek flows west across a golf course, where a dam across the creek acts as a barrier to fish migrating upstream.

Chinook salmon are not presently found in Boeing Creek (Hennick, pers. comm., 2000; King County, 2001). Coho and chum salmon have been found in the creek downstream of the dam in the golf course, where an impassable fish barrier occurs. Salmonid habitat above this barrier is limited. Sedimentation and severe downcutting of Boeing Creek's channel offer

little suitable habitat for salmonids. Williams (1975), during his work to identify salmonid use of Western Washington streams, recorded unknown salmon use prior to development within the basin. As such, cutthroat are the only likely residents of Boeing Creek above the golf course dam (Williams, 1975; Boehm, 1994; King County, 2001). These species may spawn within the lower reaches of the creek where suitable habitat occurs. Rearing may also occur for fry born in the creek. Several programs have introduced coho salmon eggs and juveniles into the reach of Boeing Creek between the M-1 Pond and Hidden Lake. Cutthroat trout also are found throughout the creek as residents(Boehm, 1994; King County, 2001).

Thornton Creek

The mainstem of Thornton Creek flows southeast from Ronald Bog, located approximately 0.75 mile west of Aurora Avenue North, and flows southwest to enter Lake Washington near Mathew Beach. The Thornton Creek mainstem is approximately 5.7 miles long, with an additional 12 miles of tributaries (Williams, 1975). Thornton Creek drains a watershed of approximately 7,200 acres (Dorothy Craig and Associates, 2000). The watershed is extensively urbanized.

Thornton Creek is a lowland-type stream with numerous areas of the watershed covered with large conifers in the residential communities (Williams, 1975). There are two small areas where stormwater runoff from the proposed project improvements would drain to Thornton Creek: North 145th Street and North 152nd Street. The centerline crest of the roadway of Aurora Avenue North between North 145th Street and North 155th Street would be considered the basin boundary between Boeing Creek (to the west) and Thornton Creek (to the east). Adjacent to the roadway along the eastern side and southern portion of the project area, stormwater runoff flows to Thornton Creek. As a result of the topography, the redevelopment of both North 152nd Street and North 145th Street (including some of the intersection area) is located within the Thornton Creek drainage basin. Aurora Avenue stormwater contributions to Thornton Creek will occur in the creek's northwestern-most tributary. This tributary is an intermittent-flow channel, which may characterized as a wet-heavily vegetated swale with limited channel characteristics.

The Watershed Characterization Report (Dorothy Craig and Associates, 2000) indicates that although chinook and coho salmon have been found in Thornton Creek, only minimal numbers of these fish return to spawn when compared to the numbers that returned to spawn historically. King County salmon distribution maps (King Co., 2001) indicate that both chinook and coho utilize the lower reaches of Thornton Creek. According to these maps, both species are found below the confluence of Maple Leafs Creek and Thornton creek. Trout (cutthroat and steelhead/rainbow) were also identified as being found in the creek (Dorothy Craig and Associates, 2000). This finding is supported by King County salmon distributions, with the exception that no steelhead trout are know to use Thornton Creek (King Co., 2001)

West Lake Washington Basin (Densmore Basin)

Stormwater from a small area of the southern extent of the Aurora Corridor Project flows southeast from the project area in stormwater pipes from approximately Roosevelt Way toward Haller Lake Playground, then generally south paralleling SR 99, and then enters Green Lake. Green Lake serves as an attenuating water body (over 300 acres) for stormwater

contributions from the proposed project in the West Lake Washington Basin. The water level in Green Lake has been raised and is currently controlled by a constructed concrete weir along the eastern section of the lake (RCA, 2001). The weir control was designed to contain runoff within the basin to various storm event levels, but can be manually controlled to allow water to flow downstream to Ravenna Creek. Water released through the weir control enters a storm pipe and flows east to its discharge in Cowen Park and into the spring-fed Ravenna Creek.

Ravenna Creek is currently channeled within Ravenna Park, where the stream is completely contained, into a collection grate at the southern end of the park, where it is conveyed to the Ship Canal waterway. Currently, King County Metro, the City of Seattle, and Ravenna Creek Alliance have proposed to "day-light" Ravenna Creek in Cowen Park and return it to its historic channel/drainage.

King County (King County, 1997) indicates that although chinook and coho salmon were likely found in the historic Ravenna Creek, only resident cutthroat trout are identified as being found in the creek above the sewage trunk-line. Rainbow trout were also observed in the creek during entomology studies (O'Neill, 1996). It is suspected that these fisheries are a remnant populations of the historic Ravenna Creek. Currently, no anadromous salmonids use Ravenna Creek.

Environmental Consequences

Construction Impacts

During construction, accidental or inappropriate discharge of sediment from cleared and excavated areas and/or spills of fuel, lubricants, and other construction-related hazardous material could result in these materials entering project area streams via stormwater runoff. The Water Quality/Surface Water Discipline Report contains detailed information on water quality impacts and the BMPs recommended to mitigate them. Introduction of possible contaminants and increased sediment loads into the streams could adversely affect aquatic communities, but the volumes of such contaminants would likely be negligible due to implementation of stormwater BMPs.

Operational Impacts

Change in the amount of impervious surface area draining to adjacent waterways is a major factor in determining the impacts of roadway projects. There are two types of effects that result from changes to impervious surface area: hydraulic effects and water quality effects. Hydraulic effects, such as stream channel scour that could affect habitats, are not a factor in the Aurora Corridor Project area because the project design components (i.e., detention facilities) would result in relatively little change in the volume of stormwater entering the creeks. In addition, runoff from any newly created impervious surfaces would be detained as well as treated for water quality to comply with stormwater requirements mandated by the City, King County, and the Washington State Department of Ecology (Ecology). Operational impacts on water quality within the project area are discussed in detail in the Water Quality/Surface Water Discipline Report. Both build alternatives are expected to result in small water quality improvements in the project area.

No Action Alternative Impacts (Construction and Operational)

If the project is not constructed, there would be no change in impervious area in the Boeing Creek, Thornton Creek, or West Lake Washington Basins, and therefore, no change in stormwater runoff volume. In addition, no stormwater treatment or detention would be needed, and, thus, the pollutant loads in the stormwater runoff transported to the receiving waters would continue. Thus, the current impacts to fishery resources would continue, with water quality and water volume discharge impacts remaining the predominant concern.

Alternative A Impacts (Construction and Operational)

The vegetation that would be removed during project construction would primarily be scattered ornamental and invasive trees and shrubs that provide little, low-quality habitat for terrestrial species.

Impacts from the construction activities associated with the Alternative A include the potential for accidental or inappropriate discharge of sediments and spills of fuel, lubricants, and other related hazardous material from construction areas into Thornton Creek, Boeing Creek, and waters that drain to the West Lake Washington Basin. The Water Quality/Surface Water Discipline Report contains detailed information on water quality impacts and recommended BMPs. Introduction of excess sediment or chemical contaminants would be detrimental to fish populations that presently inhabit project area waterways or receiving waters, including the remote potential for affects downstream to coho salmon in the lower reaches of Thornton and Boeing and creeks. However, effective implementation of the BMPs outlined in the Water Quality/Surface Water Discipline Report would provide adequate protection to ensure negligible impact to the biological communities in the project area.

As indicated in the Water Quality/Surface Water section of this EIS, the proposed project under Alternative A would result in an increase in the amount of impervious surfaces created in the Boeing Creek basin by approximately 9,800 square feet. In the Thornton Creek Basin, there would be only a slight increase in impervious surface (approximately 1,100 square feet). There is expected to be a slight decrease in the amount of impervious areas in the West Lake Washington Basin. Similarly, the operation of the project has the potential to result in stormwater discharge of sediment and contaminants that could have adverse effects downstream on identified fish population.

Alternative B Impacts (Construction and Operational)

Construction and operational-type impacts under Alternative B would be similar to those under Alternative A. Based on the planned construction of Alternative B, the potential impacts from this alternative would be anticipated to be greater than the impacts associated with Alternative A based upon the increase of impervious surfaces. Vegetation removal and/or disturbance would again be minimal, as would the impacts to terrestrial species that might inhabit this urbanized road corridor. There is limited habitat within the project area for state or federal threatened, endangered, or sensitive terrestrial species.

Alternative B would result in an increase in impervious surface because this alternative has less vegetated median than Alternative A and does not have an amenity zone planter strip along the sidewalks. This increase would occur in both the Boeing Creek and Thornton

Creek Basins, whereas the West Lake Washington Basin would have a net decrease in impervious surface area. As indicated in the Water Quality/Surface Water section of this EIS, the proposed project under Alternative B would result in an increase in the amount of impervious surfaces in the Boeing Creek Basin by approximately 29,500 square feet. As a result, stormwater runoff volumes and peak flow rates would increase somewhat. Because there would be a net increase in impervious surfaces within the basin, stormwater quantity facilities (i.e., detention facilities) as well as treatment facilities are planned for Boeing Creek. As under Alternative A, there would also be a slight increase in impervious surface (approximately 800 square feet) within the Thornton Creek Basin. Stormwater facilities would reduce the amount of sediment and contaminant discharged down to an inconsiderable level, which would not harm habitat. Additionally, implementation of the BMPs outlined in the Water Quality/Surface Water Discipline Report would further protect the aquatic integrity and resources of each of the creeks. There would still be a net decrease in impervious surfaces, approximately 2,600 square feet, in the West Lake Washington Basin.

Secondary and Cumulative Impacts

Secondary Impacts

Redevelopment would not be directly induced by the project itself. Growth is caused by estimated future population increases, which are determined and directed by the Puget Sound Regional Council agency under the Growth Management Act (GMA) and the City's Comprehensive Plan and zoning plan.

Cumulative Impacts

The cumulative effects of the Aurora Corridor Project and other future projects would involve further fragmentation of habitat. The combined change of impervious surface area from basin to basin would increase (or decrease) runoff, erosion, and sedimentation in receiving streams, potentially impacting critical and sensitive fish habitat areas. However, all future projects would include stormwater management systems to meet applicable local, state, and federal regulations concerning control of erosion and sediments. Water quality within the project area would range from unaffected to improved under Alternatives A and B (partially due to implementation of treatment/detention facilities), in adherence to the policies in the 1998 King County *Surface Water Design Manual*. The City uses the 1998 manual as modified by the City's June 2000 Development Code. Any redevelopment in the project area would also have to treat and/or detain surface water runoff; therefore, sediment-related impacts would be unlikely, protecting present habitat for fisheries. Secondary impacts to fisheries resources would be insignificant.

This would reduce impacts to fish populations to a minimal level.

Two projects—the Shoreline Interurban Trail and the future improvements along Aurora Avenue North from North 165th Street to North 205th Street—were identified as potentially having cumulative impacts when their potential impacts are assessed in combination with those of the Aurora Corridor Project. Therefore, the potential impacts on wildlife, fisheries, and vegetation of each project were combined and assessed as if they were the result of one project. The Interurban Trail is presently planned to be constructed near or adjacent to Aurora Avenue North throughout most of the project area. From North 145th to North

155th Street it would be on the western side of Aurora Avenue North, and from North 155th Street to North 205th Street along the eastern side of Aurora Avenue North. The future improvements from North 165th Street to North 205th Street are presently planned to be constructed from the northern end (North 165th Street) of the Aurora Corridor Project and to extend northward to North 205th Street. The projected start date for the improvements north of the present project is not yet determined. At the time this document was prepared, a preliminary design was available and the anticipated impacts were projected.

Boeing Creek is the only basin that is "shared" among all three projects. The Interurban Trail project shares the Boeing Creek and McAleer Creek Basins with the future improvements from North 165th Street to North 205th Street. Application of BMPs and stormwater regulations would be similar among the three construction projects, and thus would minimize the cumulative impacts to aquatic environments. Thus, the biological integrity of the Boeing, McAleer, Thornton, and West Lake Washington Basins would be protected to meet City, County, and State guidelines. Other basins would be affected individually by these projects. Where appropriate, surface water facilities would be constructed to preserve and improve water quality and protect fish habitat.

Mitigation Measures

Mitigation objectives for this project would include avoiding construction impacts and reducing the negative effects on water quality from the present roadway. Potential avoidance measures would include the following:

- Implementation of construction BMPs to avoid temporary sedimentation impacts and associated spills (e.g., silt fencing, localized material laydown areas, hay-bale berms)
- Improvements to stormwater treatment in the project area through the use of detention and treatment facilities

No mitigation activities are associated with this project at this time because impacts to the terrestrial and aquatic environments would be insignificant under the Aurora Corridor Project. Existing wildlife habitat is limited and non-listed fisheries are relatively healthy. ESA-listed species will be addressed in the BE–No Effect Letter for this project, and standard mitigation measures (e.g., BMPs) would be implemented to control and minimize potential impacts to these species. Standard BMPs include, but are not limited to, a Temporary Erosion and Sediment Control Plan, Stormwater Site Plan, and a Spill Control Plan for hazardous substances.

Historic and Archaeological Resources

Historical and archaeological resources are protected by a number of statutes and regulations at all levels of government and must be taken into consideration in this EIS. For this project, resources include existing and/or potential historic and prehistoric archaeological sites, historic buildings and structures, and Native American traditional cultural properties.

Methodology

The initial step in identifying cultural resources is to define the study areas for the archaeological and historic resource surveys. The historic resources study area was defined to include all potentially affected sites, buildings, structures, and adjacent property along Aurora Avenue North from North 145th Street to North 165th Street. The archaeological resources study area was defined to be the actual footprint of the Aurora Avenue North roadway improvements.

Before commencing the archaeological field survey, a file search was conducted at the Office of Archaeology and Historic Preservation (OAHP) in Lacey for records of previously recorded sites and previously conducted investigations. The City of Shoreline also contacted the Suquamish and Tulalip Indian tribes by letter to solicit their comments and concerns with regard to possible traditional cultural properties in the project area.

The following data sources were checked:

- National Register of Historic Places (on file at OAHP)
- Washington Register of Historical Places (on file at OAHP)
- Determinations of Eligibility (on file at OAHP)
- Archaeological site inventory files (on file at OAHP)
- Traditional Cultural Property files (some on file at OAHP, but most are in confidential Tribal archives)
- Inventory forms on file with the King County Historic Preservation Program
- Lists of heritage resources on file at the City of Shoreline

An archaeological reconnaissance survey was conducted on July 25, 2000, by staff archaeologists Dr. James C. Bard and Mr. Robin McClintock.

Initial reconnaissance of the project area was conducted on July 25, 2000, by Dr. James C. Bard and Mr. Robin McClintock. The archaeological reconnaissance consisted of a "windshield survey" of both sides of Aurora Avenue North checking for the presence/absence of open/exposed native sediments that could be inspected by pedestrian survey. A limited, but systematic, examination of the historic built environment along both sides of Aurora Avenue North was partially conducted by Dr. Bard and Mr. Charlie

Sundburg (King County Landmarks and Heritage Program) on August 16, 2000. This examination was completed on September 16–17, 2000, by Mr. Sundburg. On December 6, 2001, the SHPO concurred with the findings and recommendations of CH2M HILL's October 2001 Historic and Archaeological Resources Discipline Report and concurred that the Pershing Interburban bulkhead feature is not eligible for inclusion in the National Register of Historic Places.

Impacts and Mitigation Evaluation

The potential impacts of each alternative on cultural resources were evaluated based on the evaluation criteria noted below. Specific project impacts were evaluated to determine their significance. Significant impacts are those that are defined in 36 CFR 800.5(a)(1), often referred to as the Criteria of Adverse Effect. In fact, however, there are no "Criteria" of adverse effect; there is a single, complicated criterion (King, 2000:67). An undertaking has an adverse effect when it:

> *...may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association.*

Examples of adverse effects are listed in 36 CFR 800.5(a)(2) include physical destruction or alteration of a property, introduction of elements that diminish the integrity of the property's historic features, and removal of the property from its historic location.

There are several types of impacts to cultural resources including direct, indirect, long-term, short-term, irreversible, construction, and operation. Please see the Historical and Archaeological Discipline Report for a full description of these types of impacts.

Affected Environment

The potential impact area for this project includes Aurora Avenue North generally between North145th and 165th Streets in the City of Shoreline. The direct impact zone for this cultural resources investigation consists of the proposed streetscape improvements that would encroach on existing structures that face Aurora Avenue North. The following information provides the cultural resources environmental setting within the impact area.

Geology/Geomorphology

The City of Shoreline is located in the Puget Trough, a depressed, glaciated area that extends from the Canadian border to the Willamette Valley in western Oregon. The trough was formed by at least six periods of glacial advance, each scouring the deposits of its predecessor. Numerous post-glacial processes could have affected patterns of human subsistence and settlement and the archaeological evidence of those activities.

Several natural geomorphologic processes, singly or in combination, might be responsible for obscuring archaeological deposits that might be present in the Shoreline area. These processes, such as alluvial deposition, sea-level adjustment, erosion and slope failures, earthquake subsidence, and tsunami deposits might have contributed to site burial or submersion below present sea level.

In the Aurora Avenue North corridor, an area once heavily forested, cultural processes have been responsible for obscuring archaeological deposits (that might exist or might have existed). These processes result from the rapid settlement and urbanization following the arrival of the Interurban and Great Northern rail lines in the early decades of the 20th century, the creation and improvement of the Northern Trunk Road (Aurora Avenue North), and the post–World War II housing and commercial boom.

Previous Archaeological Investigations

A records search conducted at the OAHP revealed the complete absence of recorded prehistoric and historic archaeological sites in the immediate vicinity of the Aurora Corridor Project.

Ethnography

The City of Shoreline lies within lands and waters once controlled by the Suquamish Indians (Wessen and Stilson, 1987). At the time of historic contact there was a large Indian population in southern Puget Sound consisting of eight closely related tribal groups (Twana-Skokomish, Nisqually, Puyallup, Duwamish, Suquamish, Skykomish, Snoqualmie, and Muckleshoot), all of whom spoke Coast Salish languages (Wessen and Stilson, 1987).

These peoples were skilled fishermen, hunters, and plant collectors who used a settlement and subsistence system marked by a central base or winter village, and a cycle of movements to smaller, more informal, settlements at different times of the year to exploit locally available resources (Wessen and Stilson, 1987). These peoples were also skilled artisans and technicians who produced a wide array of objects from plants, bone, and stone. They were especially noted for their superb woodworking abilities because they used western red cedar for large plank houses with carved houseposts, canoes, bent corner boxes, and other items (Wessen and Stilson, 1987).

Prehistoric Culture Sequence

Blukis-Onat (1987) presented a developmental cultural sequence for northern Puget Sound that would pertain to any archaeological resources that might be present in the project area.

13,000 Before Present (B.P.) to 6,000 B.P. (Generalized Resource Development—Post-Glacial Settlement)

Many sites that date to this time period are located more than 100 feet above present sea level and/or are considerably inland from modern shorelines. Sites are often found on former river terraces and artifacts characteristic of this period tend to be scattered over large areas. Stratigraphically, sites are shallow and rest immediately above glacial debris. Although faunal remains and bone tools rarely are found in these sites (possibly due to soil chemistry), there are indications that both terrestrial and littoral resources were used.

6,000 B.P. to 2,500 B.P. (Specialized Resource Development—Developmental Salish)

Several local cultural developments have been noted for this time period in mainland and island regions north of Puget Sound and in the foothills of the Cascade Mountains. In northern Puget Sound, coastal sites are characterized by the addition of numerous ground stone implements to the earlier artifact assemblages. Basalt projectile points are relatively

common and microblades and cores (often of obsidian), bone and antler tools, as well as ground stone implements have been found. Toggling harpoons, indicating developed sea mammal hunting, are found in certain sites of this time range. In inland sites, bone implements are scarce (possibly due to soil conditions), but ground stone tools comparable to those at coastal sites are present. In addition, chipped stone tools are varied in style and material and are abundant at the interior locations.

2,500 B.P. to 250 B.P. (Specialized Resource Management—Established Coast Salish)

Cultural developments during this time period are well known. Numerous, but minor, local and regional differences in artifact types might result from the differences in resources available and used throughout the area as well as from differences derived from varied culture histories. The manufactured objects and other artifacts in coastal sites from this period show a full-scale development of the maritime-oriented cultures known from the ethnographic record. Inland sites reflect the fully developed, land-mammal hunting and upriver-fishing traditions of the Cascade foothills.

250 B.P. to 150 B.P. (Cultural Conflict—Euro-American Contact)

The archaeological record of this time period is poorly documented. Contact is indicated by trade goods of Spanish, Russian, British, and U.S. manufacture recovered from sites with a predominantly prehistoric artifact assemblage. Contact with Euro-American diseases changed the population and composition of Native American communities. By the end of the 19th century, the traditional lifestyles of the Northwest Coast were altered considerably and material culture was substantially altered.

Historic Setting

The north Pacific coast was first explored during the second half of the 18th century by European seafarers searching for the fabled Northwest Passage to the Atlantic Ocean. The first European discovery of the Strait of Juan de Fuca occurred in 1787 by the English captain Charles Barkley. Interest in the region intensified in the 1780s when a maritime fur trade was established. The first systematic exploration of Puget Sound by Europeans occurred in 1792 when an expedition led by Captain George Vancouver spent 2 months in the area. Vancouver's expedition named many of the prominent geographic features in the Puget Sound area.

Settlement of the Puget Sound area by Euro-Americans was slowed by the dispute between Great Britain and the United States over possession of the Pacific Northwest. Following the War of 1812, a treaty of joint occupancy was signed, which allowed citizens from both countries to settle in the region. Over the next 30 years, Euro-American activities in the region were dominated by the Hudson's Bay Company, which strongly encouraged immigrants to settle in the Willamette Valley. In 1846, an agreement was reached that set the boundary between British and U.S. territory at the 49th parallel, thus placing Puget Sound under U.S. control. The establishment of settlements around Puget Sound increased with the discovery of gold in California in 1849. The dense fir and cedar forests that extended to the shores of Puget Sound made it an ideal area for timber harvest. By the early 1850s, numerous company mill towns were located on the Sound, cutting and milling timber for export to San Francisco.

Early accounts of Shoreline include stories of Native Americans traveling along the shores of Puget Sound and local streams and collecting swordfern and kinnikinic at Richmond Beach and wild cranberries at Ronald Bog and Twin Ponds. Native peoples set controlled burns in what is now the Richmond Highlands and North City areas to create meadows that favored growth of certain wild plants and to provide open inviting habitat for small game.

In the 1880s, when railroad fever gripped the Northwest, land speculators planned towns in anticipation of the arrival of the transcontinental railroad. Richmond Beach was among such towns and was platted in 1890. The arrival of the Great Northern Railroad in Richmond Beach in 1891 triggered growth of the small town and increased the pace of development in the wooded highlands of what is now Shoreline. Travel to and from Shoreline was made easier by construction of the Seattle-Everett Interurban line in 1906 and the paving of the North Trunk Road with bricks in 1913. By 1914, people could live on a large lot, raise much of their own food and still be able to take the Interurban train or the bus to work or high school in Seattle.

During the early 20th century, Shoreline attracted large developments because of its rural, yet accessible, location. Commercial centers formed around the Interurban stops at Ronald (North 175th Street and Aurora Avenue North) and Richmond Highlands (North 185th Street and Aurora Avenue North). Automobile travel contributed to the broadened settlement pattern during the 1920s. By the late 1930s, commercial development concentrated along Aurora Avenue North, which saw increasing use as part of the region's primary north-south travel route—U.S. Highway 99.

Traffic volume on Highway 99 increased, especially after the Interurban closed in 1939. Automobile-oriented businesses along Highway 99 that are still standing included Bessie B's Cafe (now Monarch Appliances), Cox's Garage (now a dance studio and other small businesses), and Parker's (now a casino). During World War II, building materials were rationed and private housing construction came to a standstill.

The end of World War II unleashed a tremendous demand for family housing, and during the late 1940s large housing developments such as Ridgecrest (NE 165th Street to NE 155th Street and 5th Avenue North to 10th Avenue North) seemingly sprang up overnight. Schools ran on double shifts as families with young children moved into new homes. In the late 1940s, business leaders and citizens began to view Shoreline as a unified region rather than as scattered settlements concentrated at Interurban stops and railroad access points. In 1944 the name "Shoreline" was used for the first time to describe the school district. The name was coined by a student at the Lake City Elementary School to define a community that went from city line to county line and from the shore of Puget Sound to the shore of Lake Washington. Today, Shoreline is an incorporated city within King County with well over 50,000 residents.

The Shoreline Historic Resources Survey and Inventory

In September 1996, Ms. Cloantha Copass of the King County Historic Preservation Program (KCHPP) completed her Historic Resources Survey and Inventory Update for the City of Shoreline (Copass, 1996). This survey was initiated in 1994 by the KCHPP as part of its ongoing work to update its historic resources inventory. Shoreline was known to have a

high concentration of post–World War II resources associated with suburban development and the KCHPP wanted to begin evaluating this resource type.

As explained by Copass (1996), the survey team expected that most of the properties identified in the survey would be associated with development in the Shoreline area after 1938 (the previous cut-off date for consideration). In actuality, the survey team identified a number of properties that had not been included in previous inventory work. These properties were associated with the themes of highway-oriented commercial development on Highway 99, small-scale farming in the uplands, and pre–World War II suburban developments.

As detailed in Appendix A of the Copass (1996) report, Overview of Shoreline History, five phases of community development were identified: Pre-Contact (until 1880), Railroad and Mosquito Fleet (1880–1904), Interurban and North Trunk Road (1905–1929), Depression and World War II (1930–1945), and Building the Automobile Suburbs. Copass (1996) observed that road expansion projects in Shoreline potentially pose a threat to historic structures, particularly along the Highway 99/Aurora Avenue corridor. Even where buildings are not removed, changes to the site can diminish the historic integrity. Two of the historic themes identified by Copass (1996) pertain to the historic resources in the project area. Some relevant excerpts are included here.

The Interurban and the North Trunk Road (1906 to 1929)

As explained by Copass (1996), outside of Richmond Beach, Shoreline was thinly settled in the early 1900s. Travel was difficult and the region lacked land resources to support large-scale agriculture or resource-based industries other than logging. Between the opening of the Interurban in 1906 and the onset of the Great Depression in 1929, regional population growth and the development of new transportation networks linking Shoreline to Seattle spurred development. Seattle residents came to regard Shoreline as a semi-rural retreat, while Shoreline residents benefited from better access to Seattle for work or for school. During this era, small-scale residential developments and small agricultural operations were the main land uses.

In Seattle's northern suburb of Shoreline, growth spread along the commuter rail line and the expanding road network almost simultaneously with the opening of the Interurban in 1906 and the North Trunk Road (a vitrified brick highway extending north from Seattle) in 1912.

Interurban stops in Shoreline included Foy at North 145th Street, Pershing near North 157th, Maywood at North 165th Street, Ronald at North 175th Street, Richmond Highlands at North 185th Street, and Echo Lake at 18510 Aurora Avenue North. Wooden depots once stood at most of these stops, but today the right-of-way and the cement bulkhead that once supported the Pershing Bridge at North 155th Street and Aurora Avenue North are the only remaining physical evidence of the Interurban route. MacPherson's Property Management building located at 18510 Aurora Avenue North was built around the Richmond Highlands Interurban stop.

The Interurban era had hardly begun when the first signs of the automobile-oriented future appeared in Shoreline with the opening of the North Trunk Road (later largely replaced by Aurora Avenue North). By 1912, the two-lane, all-brick North Trunk Road extended from

Greenlake north to the county line. By the late 1920s, development became increasingly automobile oriented, and development spread farther east and west from the main transportation spine. In 1925, portions of the North Trunk Road were made part of Highway 99.

Highway 99 became the focus of automobile-oriented business. New businesses in the late 1920s and early 1930s included cafes, roadhouses, and gas stations. For the most part, the commercial centers already formed at the Interurban stations remained the focus of the automobile-oriented commercial developments.

Building the Automobile Suburbs (1946 to 1956)

The end of World War II signaled what was described in the 1952 King County Planning Commission's "Shoreline Report: Studies for a Comprehensive Plan" as "the breaking of the dam." With the end of war-time restrictions on automobile use, Shoreline once again became a desirable area for Seattle workers to live. New residents poured into the Shoreline area, creating tremendous demand for new housing developments, new shopping centers, and new schools. This same study noted that commercial development had increasingly focused on Aurora Avenue North and the comprehensive plan described the commercial development as "gas stations, hamburger stands, commercial signs, tourist courts, and trailer parks" interspersed with "better" commercial shopping districts.

Environmental Consequences

The Aurora Corridor Project area contains no prehistoric or historic archaeological sites that are currently listed on, nominated to, or determined eligible for the NRHP or the WRHP. Similarly, the project area contains no historic buildings or structures that are currently listed on, nominated to, or determined eligible for the NRHP or WRHP.

The results of the literature review and field examination of the project area are presented in Table 3-38. These findings were recently reviewed by the Washington State Historic Preservation Officer (SHPO). On December 6, 2001, the SHPO wrote to Mr. Brian Hasselbach (WSDOT) that it concurs with the findings and recommendations of CH2M HILL's October 2001 Historic and Archaeological Resources Discipline Report and confirmed that the Pershing Interurban bulkhead is not eligible for inclusion in the NRHP.

Table 3-38
Potential Historical Resources

Address[a]	Year Built	Historic Name *Inventory Status* State Study Theme	Current Name *Anticipated Project Effect*	OAHP HTP Listing	CH2M HILL's Determination of NRHP Eligibility[bc]
Interurban Era (1906 to 1939)					
14525	1917	Hide-a-Way Tavern	The Hideaway Card Room *ROW encroachment*	--	Ineligible *unless reconstructed*
At North 155th	1926	Pershing Interurban bulkhead	Interurban bulkhead *ROW encroachment*	--	Ineligible
Early Highway Era (1940s)					
14825	--	Unnamed building	*ROW encroachment*	PS1-037	Ineligible
14919	--	Skyline Motel	Quest Inn Motel	PS1-042	Ineligible

Table 3-38
Potential Historical Resources

Address[a]	Year Built	Historic Name *Inventory Status* State Study Theme	Current Name *Anticipated Project Effect*	OAHP HTP Listing	CH2M HILL's Determination of NRHP Eligibility[bc]
			ROW encroachment		
15205	1956	Maddy's Auto Repair	Maddy's Automotive *ROW encroachment*	PS1-041	Ineligible
16037	1945	Private home	Halecrest Vet. Hospital *ROW encroachment*	--	Ineligible
16053	1945	Produce market	Music Menu/Sungard Window Tinting *ROW encroachment*	--	Ineligible

[a] *All street addresses are on Aurora Avenue North.*
[b] *Preliminary NRHP recommendations made by CH2M HILL.*
[c] *SHPO concurrence with CH2M HILL's Determination of NRHP Eligibility was provided to WSDOT on December 6, 2001.*

The following properties appear to lack integrity or architectural merit, but have some historic associations:

- The Pershing Interurban Bulkhead, located at North 155th Street and Aurora Avenue North, was constructed in 1926. The potential impacts of the project appear to be limited to right-of-way encroachment. This concrete feature was inventoried in January 2001 by CH2M HILL. CH2M HILL has determined this bulkhead feature is ineligible for inclusion in the NRHP due to loss of integrity and setting, and its inability (as an isolated feature) to convey its historic association with the former Interurban system. This determination was confirmed by the SHPO on December 6, 2001 (see letter in Chapter 4 of this document).

- The Hide-a-Way Tavern, located at 14525 Aurora Avenue North, was constructed in 1917. The tavern demonstrates continuity of use and strong association with roadside recreation and entertainment from the early Depression years of road and highway use of U.S. Highway 99 (Aurora Avenue North). However, it has frontal and other additions, changes in openings and materials, and other alterations that severely compromise its integrity, and restoration of its historic character would require major reconstruction. CH2M HILL had determined that this building is not eligible for inclusion in the NRHP due to physical alterations and an inventory form was, therefore, not completed for this structure. This determination was confirmed by the SHPO on December 6, 2001 (see letter in Chapter 4 of this document).

- A number of post–World War II commercial buildings retain some degree of physical integrity, but have no particular architectural or historic significance other than their late association with highway and suburban strip-commercial activity. The unnamed building at 14825 Aurora Avenue North is a good example of such post-World War II commercial buildings with no apparent architectural or historic significance. The Quest Inn Motel (formerly the Skyline Motel) may also be an example but for its associated older structure located to the rear of the main building (facing the proposed Interurban Trail) that might have architectural or historical significance. CH2M HILL has determined that the post-World War II commercial buildings are not eligible for

inclusion on the NRHP. This determination was confirmed by the SHPO on December 6, 2001 (see letter in Chapter 4 of this document).

An archaeological reconnaissance survey revealed that the entire project area (the area within the limits of the proposed roadway improvements) lacked any areas of open/exposed native sediments. Where the ground surface was not paved, it was covered with gravel or landscaping.

The project area is located in an area of low sensitivity for the presence of Native American archaeological sites. Aurora Avenue North crosses no streams or rivers, is located well away from the shores of Puget Sound and Lake Washington, and is located away from inland lakes and bogs such as Echo Lake, Ronald Bog, and Haller Lake. Historic archaeological sites, if present, would probably post-date the 1920s when Euro-American development increased in the area.

Construction Impacts

For the build alternatives, the temporary presence of construction machinery and vehicles is not expected to have any impacts on properties that are either eligible or potentially eligible for listing on the NRHP or WHRP. Although none of the Tribes contacted by letter responded to a solicitation to provide information on possible traditional cultural properties in the project area, short-term construction impacts could adversely affect traditional cultural properties that might be present.

Operational Impacts

The proposed project would have no long-term proximity impacts to properties potentially eligible for listing on the NRHP or WHRP. Proximity impacts are not direct physical impacts, but rather are impacts resulting in a change of setting that could alter the mood or feeling of a historic property. The expansion of the right-of-way along Aurora Avenue North would bring traffic and its accompanying noise and vibration closer to the historic properties, potentially changing the nature of their historic settings. Because none of these properties are believed to be eligible for inclusion in the NRHP or WRHP, these possible proximity impacts need not be mitigated.

If archaeological sites are discovered during construction, they would either be avoided or would be subject to mitigation measures if avoidance is not possible. Once constructed the project should not produce any long-term operation impacts to archaeological sites.

No Action Alternative

If the project was not constructed, the buildings facing Aurora Avenue North would not be affected and would, presumably, continue to be occupied by businesses depending on customer access by automobile.

Alternative A

Once constructed, traffic movement along Aurora Avenue North would be improved. Smoother traffic flows might result in some beneficial conditions to existing buildings facing the street. Smoother flowing traffic and increased levels of service might reduce noise and vibration and improve air quality. Some indirect impacts that produce "proximity effects"

might occur because traffic would be physically closer to the buildings as a result of construction of the project improvements that are closer to the buildings facing the street.

Alternative B

Operational impacts for this alternative would be similar to those under Alternative A. Proximity impacts would be slightly farther away from existing buildings due to the narrower width of the roadway and improvements.

Secondary and Cumulative Impacts

No secondary impacts caused by the proposed improvements have been identified. The cumulative impact of the project and other future projects in the area would increase the potential for disturbance and alteration over a larger project area. Major public projects proposed for the vicinity include the Interurban Trail project and future improvements to Aurora Avenue North between North 165th Street and North 205th Street. As described in the Technical Memorandum prepared by CH2M HILL for the Interurban Trail (see the Historic and Archaeological Resources Discipline Report [see Appendix D for locations and copies]), the Shoreline Motel located at 16526 Aurora Avenue North (which is located north of the Aurora Corridor Project area between North 165th Street and 167th Street) would probably not be affected by the Interurban Trail. The easternmost Shoreline Motel building faces the proposed Interurban Trail. The Shoreline Motel has not been subject to documentation through completion of a Historic Inventory Form, nor has its NRHP eligibility status been evaluated.

As shown in Table 3-39, four older properties might be affected by future improvements to Aurora Avenue North between North 165th Street and North 205th Street: Auto Cabins at 17203 Aurora Avenue North, County Road Number 917 (Brick Road), the Weiman House at 19230 Aurora Avenue North, and the Erickson House at 19502 Aurora Avenue North. The nature of potential project impacts on the three buildings appears to be limited to right-of-way encroachment. The potential project impacts to the Brick Road might involve removal of a small portion of the historic brick road surfacing. Environmental documentation for improvements to Aurora Avenue North from North 165th Street to North 205th Street must investigate the potential impacts mentioned above as well as to the Shoreline Motel if proposed street improvements would encroach on the front (the side that faces Aurora Avenue North) facade. While the Interurban Trail project would not affect the Shoreline Motel, construction on Aurora Avenue North north of North 165th Street could have direct or indirect impacts on the motel.

Table 3-39 describes buildings along Aurora Avenue North between North 145th Street and North 205th Street in terms of two historic themes: Interurban Era (1906–1939) and Early Highway Era (1940s). The preliminary NRHP recommendations are those of CH2M HILL's cultural resource specialists; formal consultation with the Washington SHPO regarding the impacts of the project have not yet occurred.

Mitigation Measures

Mitigation measures for the proposed project are discussed in terms of archaeological resources, ethnohistorical resources, and historic resources.

Archaeological Resources

Surface visibility was too limited to adequately determine if prehistoric or historic archaeological sites are present. Because there is a low probability of the presence of prehistoric archaeological sites in the project area, no further investigative work is needed and construction can proceed without archaeological monitoring.

If previously undiscovered archaeological remains are encountered during construction activities, appropriate mitigation measures would be followed to ensure their identification, evaluation, and disposition. If prehistoric archaeological sites are detected during construction, work should be halted in the immediate vicinity of the find.

The Washington State Department of Transportation (WSDOT) has established operational procedures to deal with discoveries of bones during construction. Please see the Historical and Archaeological Resources Discipline Report for a full description of the WSDOT procedures.

Ethnohistorical Resources

The Suquamish and Tulalip Indian Tribes were contacted by letters in September 2000 to solicit their comments and concerns with regard to possible traditional cultural properties in the project area. As of August 2001, these tribal groups have not responded to the City of Shoreline with their concerns or comments. If the Tribes respond with comments, additional investigative work might be required to address their concerns. If the Tribes report the presence of Traditional Cultural Properties, additional compliance work would likely be required in accordance with federal guidance (Parker and King, 1990). The City will continue to consult with the Tribes.

Historic Resources

The historic properties located within the project area are believed to be ineligible for inclusion in the NRHP. Therefore, no mitigation measures are recommended.

The vast majority of the buildings that flank Aurora Avenue North have suffered serious loss of their physical integrity. Most of the buildings are simple vernacular commercial buildings that have undergone one or more changes to cladding, windows, window openings, and overall form (additions). They are, nonetheless, the physical remnants of Shoreline's history related to its primary transportation corridors (the Interurban, North Trunk Road, and the various forms of Highway 99 and Aurora Avenue North). Therefore, properties not already inventoried should be added to the Copass (1996) inventory and documented appropriately, with historic tax photographs and other old images, and information collected in one place.

TABLE 3-39
Buildings in Project Area along Aurora Avenue North

Address: Aurora Avenue North	Year Built	Historic Name *Inventory Status* State Study Theme	Current Name *Anticipated Project Effect*	OAHP HTP Listing	Preliminary NRHP Recommendation
Interurban Era (1906–1939)					
14525	1917	Hide-a-Way Tavern	The Hideaway Card Room *ROW encroachment*		Ineligible
At North 155th Street	1926	Pershing Interurban bulkhead	Interurban bulkhead *ROW encroachment*		Ineligible
16708	1930	Charmland Dance Hall	Drift On Inn Casino *ROW encroachment*		Ineligible
16725	1915	John Witham's House	Credit Motors *ROW encroachment*		Ineligible
16730	1924	Home/Carey's Restaurant	Your Choice Video *ROW encroachment*		Ineligible
17001	1930	Parker's Ballroom *Inventoried* Entertainment/Recreation	Parker's Sports Bar & Casino *ROW encroachment*		Ineligible
17203	1930	Auto Cabins *Inventoried* Architecture/Transportation	Apartments *ROW encroachment*	PS1-040	**Eligible** possible 4(f)
Ronald Place	1911	County Road No. 917 *Inventoried* Transportation	Brick Road *partial removal*	PS1-038-R	**Eligible** possible 4(f)
17512	1937	Cox's Garage *Inventoried* Commerce/Transportation	Kym's Kiddy Corner *removal/demolition*		Ineligible
17526	1931	Graney Shoe Repair *Inventoried* Commerce	Cobbler's Cottage Gifts *removal/demolition*		Ineligible

TABLE 3-39
Buildings in Project Area along Aurora Avenue North

Address: Aurora Avenue North	Year Built	Historic Name *Inventory Status* State Study Theme	Current Name *Anticipated Project Effect*	OAHP HTP Listing	Preliminary NRHP Recommendation
17532	1938	Aurora Cold Storage *Inventoried* Commerce	Seattle's Finest Exotic Meats *removal/demolition*		Ineligible
17839	1928	Ronald Methodist Church	Ronald U. M. Church *ROW encroachment*		Ineligible
18400	1930	Bessie B's Café *Inventoried* Commerce	Monarch Appliances *removal/demolition*		Ineligible
18413	1935	Nelson Drug Store Building	Spiro's Pizza Pasta *removal/demolition*		Ineligible
18419	1916	Nelson Drug Store Building/Evan's Grocery	A World of Collections *removal/demolition*		Ineligible
18510	1927	Richmond Highlands Interurban Station site/ Colegrove's	MacPherson's Property Management *removal/demolition*		Ineligible
19230	1924	Weiman House *Inventoried* Architecture	Weiman House *ROW encroachment*		**Eligible** possible 4(f)
19425	1937	Private home	*ROW encroachment*		Ineligible
19502	1923	Erickson House *Inventoried* Architecture	Erickson House *ROW encroachment*		**Eligible** possible 4(f)
19508	1928	Echo Lake Tavern *Inventoried* Commerce/Recreation	Echo Lake Tavern *ROW encroachment*		Ineligible
19918	1934	"Sample" Cabin	Top Tattoo *removal/demolition*		Ineligible

TABLE 3-39
Buildings in Project Area along Aurora Avenue North

Address: Aurora Avenue North	Year Built	Historic Name *Inventory Status* State Study Theme	Current Name *Anticipated Project Effect*	OAHP HTP Listing	Preliminary NRHP Recommendation
Early Highway Era (1940s)					
14825	N/A	Unnamed building	*ROW encroachment*	PS1-037	Not examined
14919	N/A	Skyline Motel	Quest Inn Motel??? *ROW encroachment*	PS1-042	Not examined
15205	1956	Maddy's Auto Repair	Maddy's Automotive *ROW encroachment*	PS1-041	Ineligible
16037	1945	Private home	Halecrest Vet. Hospital *ROW encroachment*		Ineligible
16053	1945	Produce market	Music Menu/Sungard Window Tinting *ROW encroachment*		Ineligible
16523	1947	Ken Howe is investigating historic name/occupant	Seattle Auto Center *ROW encroachment*		Ineligible
16526	1948	Shoreline Motel	Shoreline Motel *ROW encroachment*		Not examined
16716	1945	WW II Surplus Store	Hollywood Pizza *ROW encroachment*		Ineligible
16737	1947	Warren's Cleaners	Lupe's Tienda *ROW encroachment*		Ineligible
16740	1940	Egg's Building	National Food Corporation *ROW encroachment*		Ineligible
16748	1948	Grocery store	*ROW encroachment*		Ineligible
17000	1948	Bookey Building/ Grocery store	Simmons Mattress Out./ NW Discount World *ROW encroachment*		Ineligible

TABLE 3-39
Buildings in Project Area along Aurora Avenue North

Address: Aurora Avenue North	Year Built	Historic Name *Inventory Status* State Study Theme	Current Name *Anticipated Project Effect*	OAHP HTP Listing	Preliminary NRHP Recommendation
17010	1947	Furnace store	Pawn Exchange *ROW encroachment*		Ineligible
17014	1943	Barber Shop	Taboo Video ?? *ROW encroachment*		Ineligible
17020	1946	Highlands Bakery	Underhill's Fine Wood Furniture ?? *ROW encroachment*		Ineligible
17244	1949	Aurora Rents	Aurora Rents *removal/demolition*		Ineligible
17550	1958	Tube & Lube	All Star Transmission *ROW encroachment*	PS1-039	Not examined
18019	1946	Whitney Hardware	Richmond Highlands Veterinary Hospital *ROW encroachment*		Ineligible
18320	1940	Stevenson's Grocery	Singapura/TayDo Restaurant *ROW encroachment*		Ineligible
19223	1940	Private home	*ROW encroachment*		Not examined
19522	1941	Motel	Echo Lake Apartments *ROW encroachment*		Ineligible
19804	1948	Ken Howe is investigating historic name/occupant	Bug Haus Window Tinting/Glass *ROW encroachment*		Ineligible
19928	1942	Mini mall	Mini mall *ROW encroachment*		Ineligible

Methodology

The analysis presented in this section is based on guidance provided by the Federal Highway Administration (FHWA, 1981). The six general steps undertaken for this project include (1) defining the visual environment of the project; (2) identifying the key views for the visual assessment; (3) analyzing existing visual resources and viewer response; (4) depicting the visual appearance of project alternatives; (5) assessing the visual impacts of project alternatives; and (6) determining ways to mitigate adverse visual impacts.

Fieldwork was conducted to determine the project area's current visual character and quality, its principal elements, and potential viewer groups and their exposure and sensitivity. Potential views within the project area were documented with photographs. The geographic area considered in this analysis extends from the northern to the southern terminus of the project, and generally one-block deep to the east and west of Aurora Avenue North. Current studies and documents were also consulted.

For this analysis, an impact is considered substantial if a change occurs to a visual resource to such an extent that it negatively changes viewer response.

Affected Environment

The discussion of the affected environment identifies the landscape of the geographic region, the project viewshed, potential viewer groups, and their exposure and sensitivity.

Landscape

Existing Visual Character

Although the visual character of the Aurora Corridor Project is defined by the manmade environment, the natural environment also shapes viewers' experience of the corridor.

Topography

The City of Shoreline has a rolling topography covered with evergreen trees and other vegetation. The topography and vegetation provide the setting for the project area.

The project extends from approximately 575 feet south of North 145th Street to 400 feet north of North 165th Street. The southern terminus of the project is near the crest of a hill (approximately North 145th Street), and the lowest point occurs at about North 155th Street. The northern terminus of the project, approximately North 165th Street, is about half way up the next grade. From North 145th Street to North 155th Street, the topography of adjacent development slopes downward from west to east. From North 155th Street to North 165th Street, the direction of the slope changes, sloping downward from east to west.

As shown in Figures 3-7 and 3-8, the project area's topography defines the potential viewsheds by providing vistas. Stands of evergreen trees frame development along the corridor. The treetops set the visual horizon for the project area.

Streetscape

The project area is dominated by strip commercial development, with buildings set away from the street and fronted by large parking lots. Asphalt driveways and parking areas are continuous and in many places are undifferentiated from the roadway pavement, thus blending the areas where people walk with traffic lanes. Sidewalks are present in a few locations. The majority of the project area lacks landscaping, and what does exist is sparse and inconsistent. Commercial signs, billboards, and utility poles dominate the landscape because of their visibility. Located throughout the project area, the signs vary in height, type, size, and location relative to the street edge.

Viewer Groups

Viewer groups include people with views from the road and people with views of the road. People with views from the road include tourists, commuters, local drivers, transit riders, and pedestrians. People with views to the road include residents and business employees and patrons.

The viewer groups with the greatest exposure to the roadway are those who use the roadway: pedestrians, transit riders, and vehicle occupants. As vehicle occupants enter the project area from slightly south of North 145th Street or slightly north of North 165th Street, they have an unobstructed sightline of the project area. (Their visual experience is shown in Figure 3-7, top photograph.) Pedestrians have a sightline similar to that of vehicle occupants, but pedestrians are also exposed to the vehicle traffic (Figure 3-8, top photograph). Transit riders have views in common with pedestrians; however, the view is constant while waiting for the bus.

Even though the greatest number of people viewing the road might be vehicle occupants, pedestrians and transit riders waiting for the bus are exposed to the road for longer periods of time.

To reach their destinations business employees and patrons will have the same experience as vehicle occupants, pedestrians, or transit riders. It is assumed that once they reach their destinations they do not pay attention to the road.

For the most part, residents with views of the road have low exposure. Residents with views of the road are located behind the commercial uses that line Aurora Avenue North (there are no residences adjacent to the roadway). Although residents can see the road, their views are typically obstructed. A typical view from a residence includes utility lines, commercial signage, and a small section of the right-of-way.

The views of pedestrians, vehicle occupants, and residents (and corresponding viewpoint locations) are shown in Figure 3-9.

Looking north along Aurora Avenue North from the intersection of North 145th Street. Gateway to Shoreline.

Looking north from near the high point of the project's southern terminus (North 145th Street). The topography of the area permits an unobstructed view of the entire project area.

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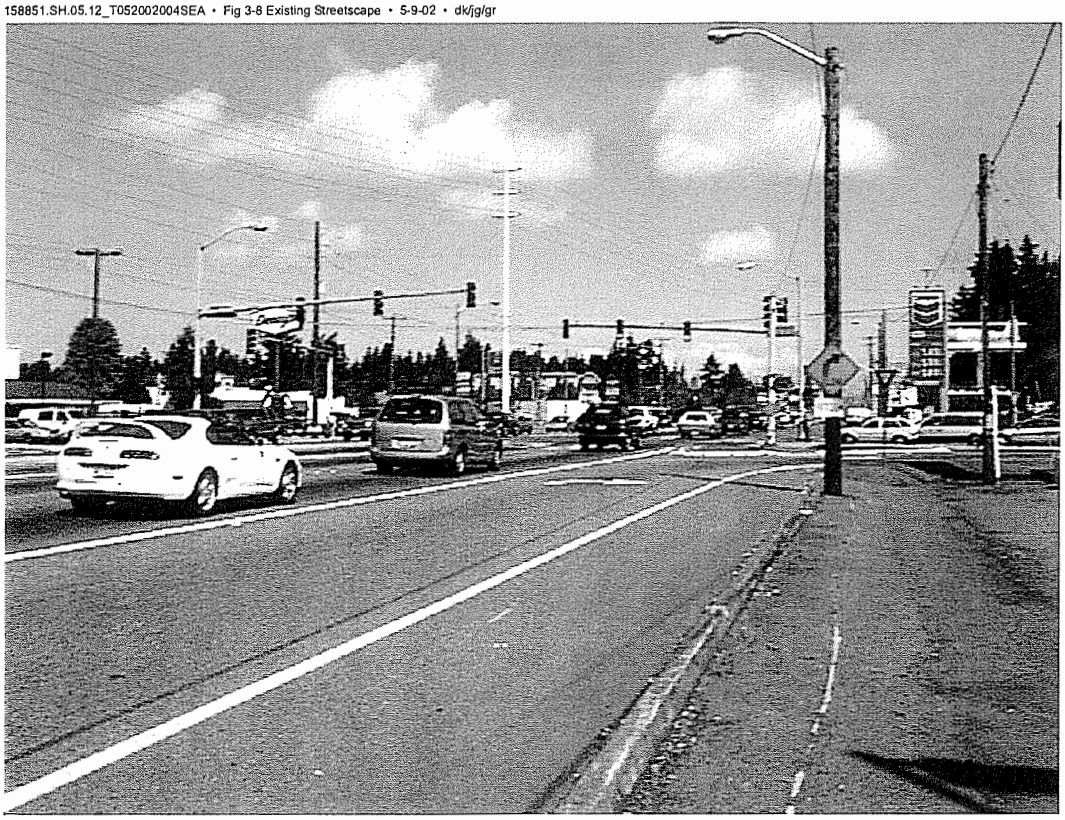
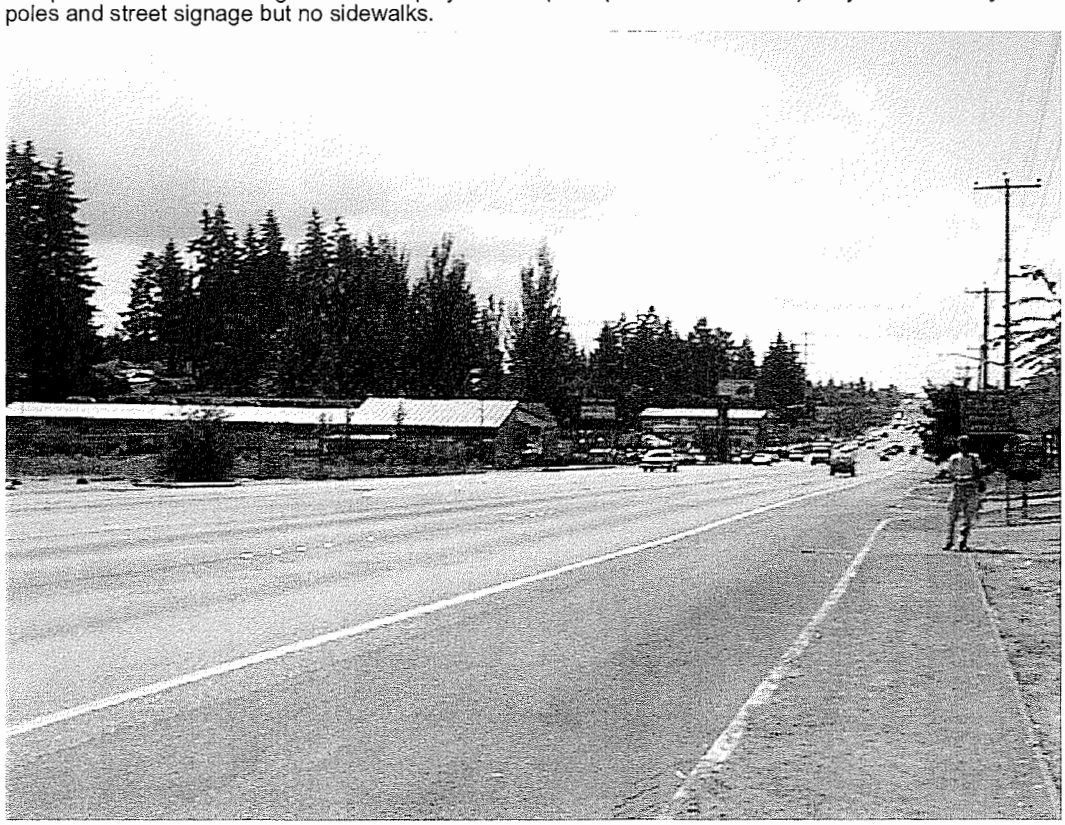
Aurora Avenue North Multimodal Corridor Project:
North 145th Street to North 165th Street

Figure 3-7
Existing Streetscape

158851.SH.05.12_T052002004SEA • Fig 3-8 Existing Streetscape • 5-9-02 • dk/jg/gr



The pedestrian view looking north at the project's low point (North 155th Street) – a jumble of utility poles and street signage but no sidewalks.



Looking south from North 165th Street to North 145th Street; peak elevation at project's northern terminus.

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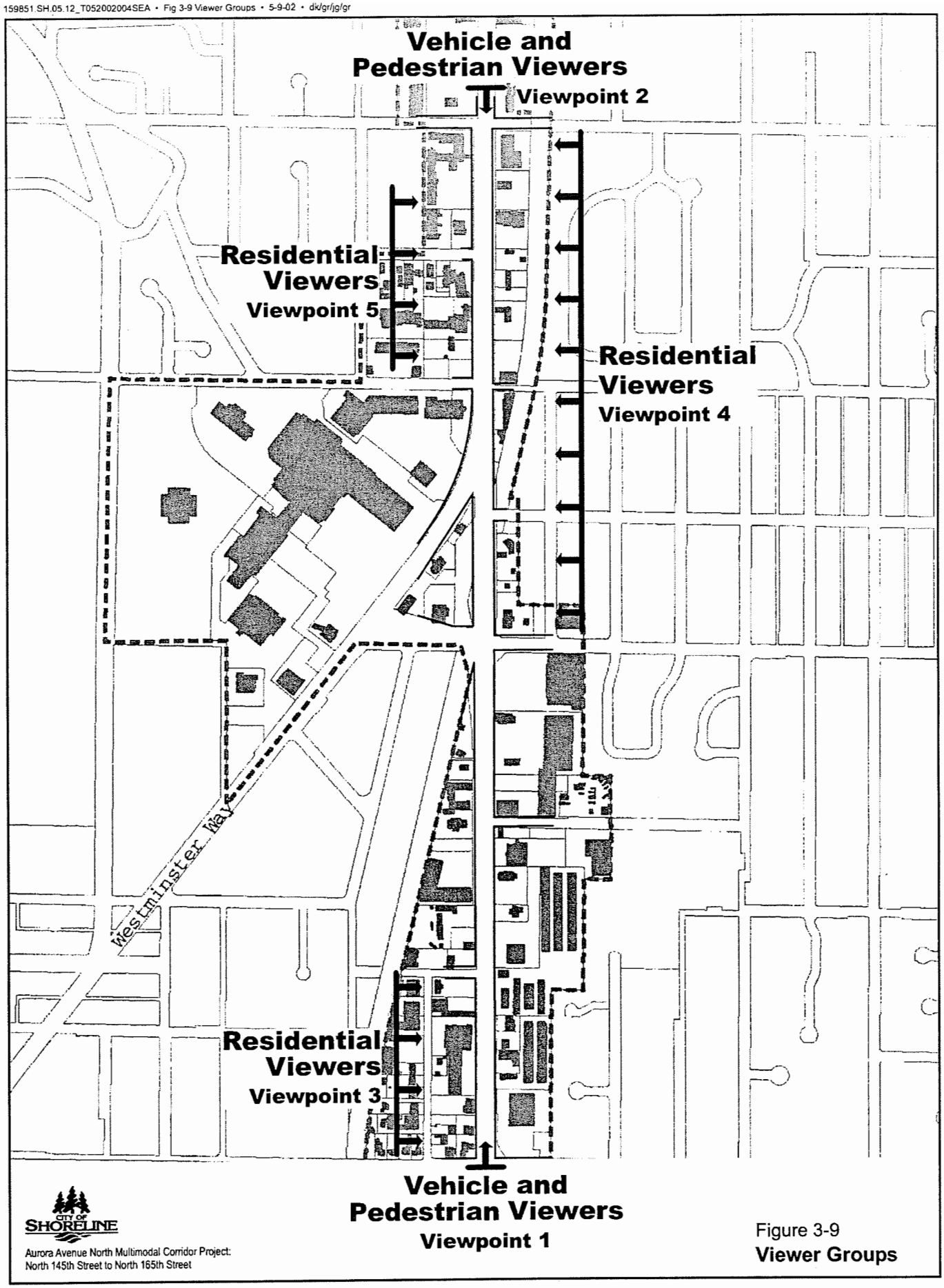
Aurora Avenue North Multimodal Corridor Project:
North 145th Street to North 165th Street

Figure 3-8
Existing Streetscape



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Aurora Avenue North Multimodal Corridor Project:
North 145th Street to North 165th Street

Figure 3-9
Viewer Groups

Visual Quality

Evaluating the existing visual quality within the project area provides a standard for judging the changes that would occur as a result of the alternatives. One set of criteria that can be used to judge visual quality includes three elements: vividness, intactness, and unity. These criteria are defined by FHWA guidance (1981), as follows:

- Vividness—Visual power or memorability of landscape components as they combine in striking and distinctive visual patterns
- Intactness—Visual integrity of the natural and manmade landscape and its freedom from encroaching elements
- Unity—Visual coherence and compositional harmony of the landscape

None of these by itself is equivalent to visual quality; all three must be high to indicate high quality.

The visual quality of the project area is low because it lacks vividness, intactness, and unity. The visual quality of the project area is summarized quantitatively in a visual analysis matrix presented in Table 3-40.

The project area lacks vividness because it is not distinctive. No interesting landforms or waterforms are present in the project area to make it distinctive. The natural landscape has been highly disturbed by the encroachment of human development. In addition, the manmade environment, characterized by commercial strip development, also lacks visual interest or distinction.

Throughout the project area various commercial building signs, utility lines and poles, street signage, and other elements diminish visual intactness. The project area lacks visual unity. Development along the corridor occurs at varying distances from the roadway, eliminating the possibility of a unified street edge. The lack of consistent sidewalks and landscaping contributes to the lack of street edge. Prior to the City's incorporation in 1995, there were no consistent architectural or site development standards that might have provided unifying visual elements. At public workshops, Shoreline residents have called the Aurora Avenue Corridor a "hodgepodge" (Shoreline, 1997).

Environmental Consequences

Construction Impacts

The No Action Alternative would not cause any construction-related impacts.

The types of visual quality impacts that would occur during construction under Alternatives A and B would be the same.

Temporary visual impacts would include the presence of construction equipment, materials, signage, and staging areas in the construction zone that would reduce the visual quality of the immediate area during construction.

TABLE 3-40
Visual Analysis Matrix

Parameter	No Action Alternative					Alternative A					Alternative B				
Viewpoint	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
View Orientation	N	S	E	W	E	N	S	E	W	E	N	S	E	W	E
View Distance															
Foreground															
Middleground	√	√				√	√				√	√			
Background			√	√	√			√	√	√			√	√	√
Viewer Position															
Inferior															
Level			√					√					√		
Superior	√	√		√	√	√	√		√	√	√	√		√	√
Vividness															
Landform	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Waterform	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vegetative	1	1	1	2	2	8	8	8	8	8	5	5	5	5	5
Human-Made	1	1	1	1	1	7	7	7	7	7	4	4	4	4	4
Average	0.75	0.75	0.75	1	1	4	4	4	4	4	2.5	2.5	2.5	2.5	2.5
Intactness															
Development	3	3	3	4	4	3	3	3	4	4	3	3	3	4	4
Encroachment	2	2	2	3	3	5	5	5	6	6	5	5	5	6	6
Average	2.5	2.5	2.5	3.5	3.5	4	4	4	5	5	4	4	4	5	5
Unity															
Overall	1	1	1	1	1	7	7	7	7	7	5	5	5	5	5
Total Visual Quality[a]	**1.4**	**1.4**	**1.4**	**1.75**	**1.75**	**5**	**5**	**5**	**5.3**	**5.3**	**3.8**	**3.8**	**3.8**	**4.2**	**4.2**

Temporary lighting might be necessary for nighttime construction of certain project elements or at certain locations. This temporary lighting could impose impacts on nearby residential areas by exposing residents to uncomfortable glare from unshielded light sources or by increasing ambient nighttime light levels.

Operational Impacts

The visual impacts of a project result from two phenomena: physical changes to the visual environment and viewer response to those changes. It is simple to identify visual changes to the environment, but it is more difficult to identify viewer response because viewers can have different values and perceptions. For this analysis, it is assumed that if the vividness, intactness, and unity of the project improve then viewer response to that change is favorable, and if these qualities worsen then viewer response is unfavorable.

No Action Alternative

The visual environment would not change under the No Action Alternative.

Alternative A

The elements of Alternative A that would have the greatest impact on visual quality would be the streetscape improvements, including defined driveways, curbs, gutters, and sidewalks, and landscaping within the amenity zones and medians. The sidewalks would be 8 feet wide with a 4-foot-wide amenity zone (see Figure 2-2). Trees in the amenity zone would be at least 18 inches from the curb. The sidewalks would be continuous throughout the project area. In addition, utility lines would be placed underground and new roadway and pedestrian lighting would be installed. Two planting and paving schemes would be applied to the Aurora Corridor Project: the "green" treatment and the "urban" treatment. Potential examples of these treatments and the locations where they would be applied are shown in Figure 3-10. Within the urban treatment/high pedestrian areas, special paving treatment would be used. The specifications for this paving treatment have not yet been determined. However, the special paving would be designed to avoid tripping hazards and differential settlement. Any changes in paving type or textures would be ADA compatible. Figure 3-10 presents one possible pattern and Figure 3-11 shows other conceptual ideas. The optional concepts shown in Figure 3-11 would be more distinctive in their use of special paving treatments, such as texture, color, and patterning.

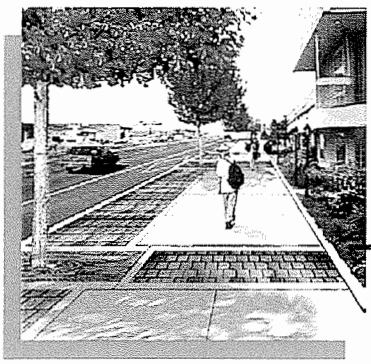
Also shown in Figure 3-11 is the tree planting concept, which would use maple trees with a caliper no greater than 4 inches. Different maple trees would be planted along the project area so that the autumn color of the leaves would be different in different areas of the project. The size and scale of the trees, as well as the spacing between plantings, would avoid conflicts with buses and sight distance problems.

Visual Change

Table 3-40 summarizes the visual quality impacts of Alternative A quantitatively. Alternative A's landscaping and other streetscape improvements would make the project area distinctive and vivid, and the specialized elements, such as textured paving, at the connections would provide visual interest. The visual intactness of the project area would be improved under Alternative A because utilities would be placed underground, which would eliminate the poles and lines that currently clutter the horizon. Visual unity would

Legend

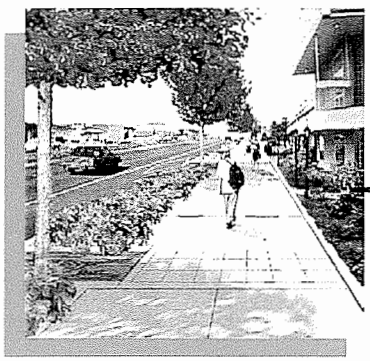
- Crossing
- Red/Purple Autumn Foliage
- Orange Autumn Foliage
- Yellow Autumn Foliage
- Interurban Trail



'Urban' Treatment

Treatment in High Pedestrian Areas

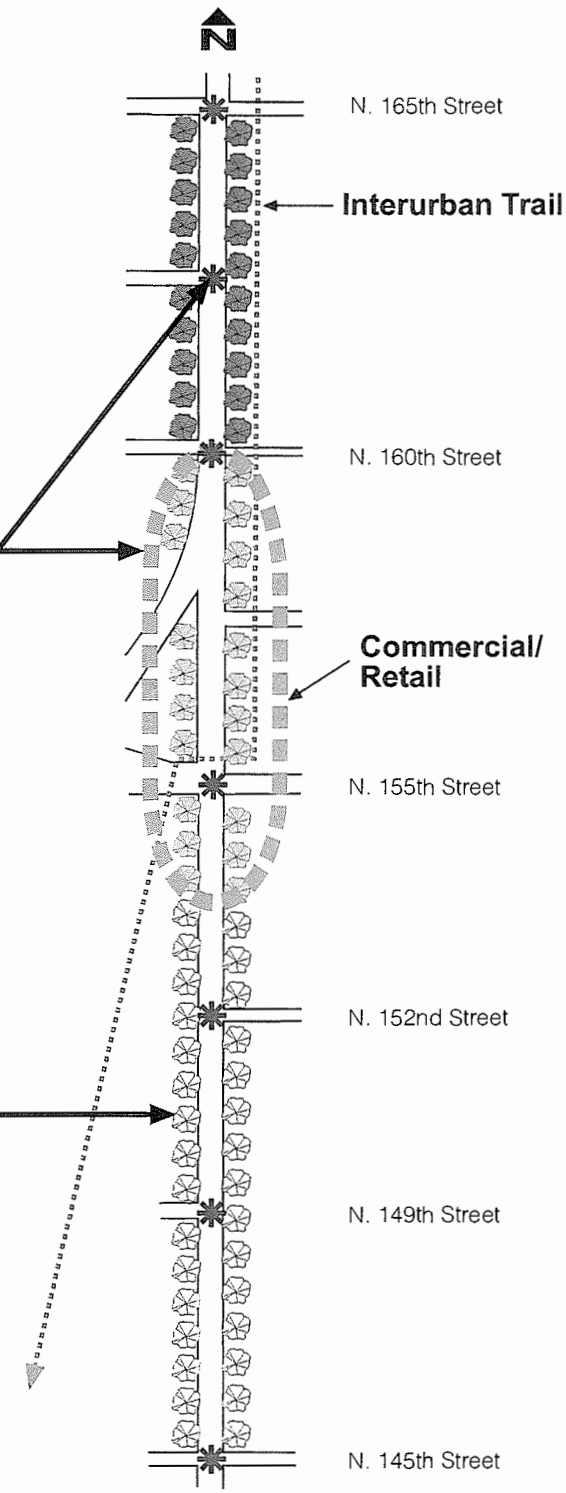
- Trees in tree grates in the 4' amenity zone
- Special paving in the sidewalk area and the 4' amenity zone
- Trees, shrubs, and groundcover in the center median area
- Shrubs and groundcover in the refuge area



'Green' Treatment

Treatment Throughout Corridor
(Outside High Pedestrian Areas)

- Trees in tree grates in the 4' amenity zone
- Scored concrete in the sidewalk area
- Shrubs/groundcover in the 4' amenity zone
- Trees, shrubs, and groundcover in the center median area
- Shrubs and groundcover in the refuge area



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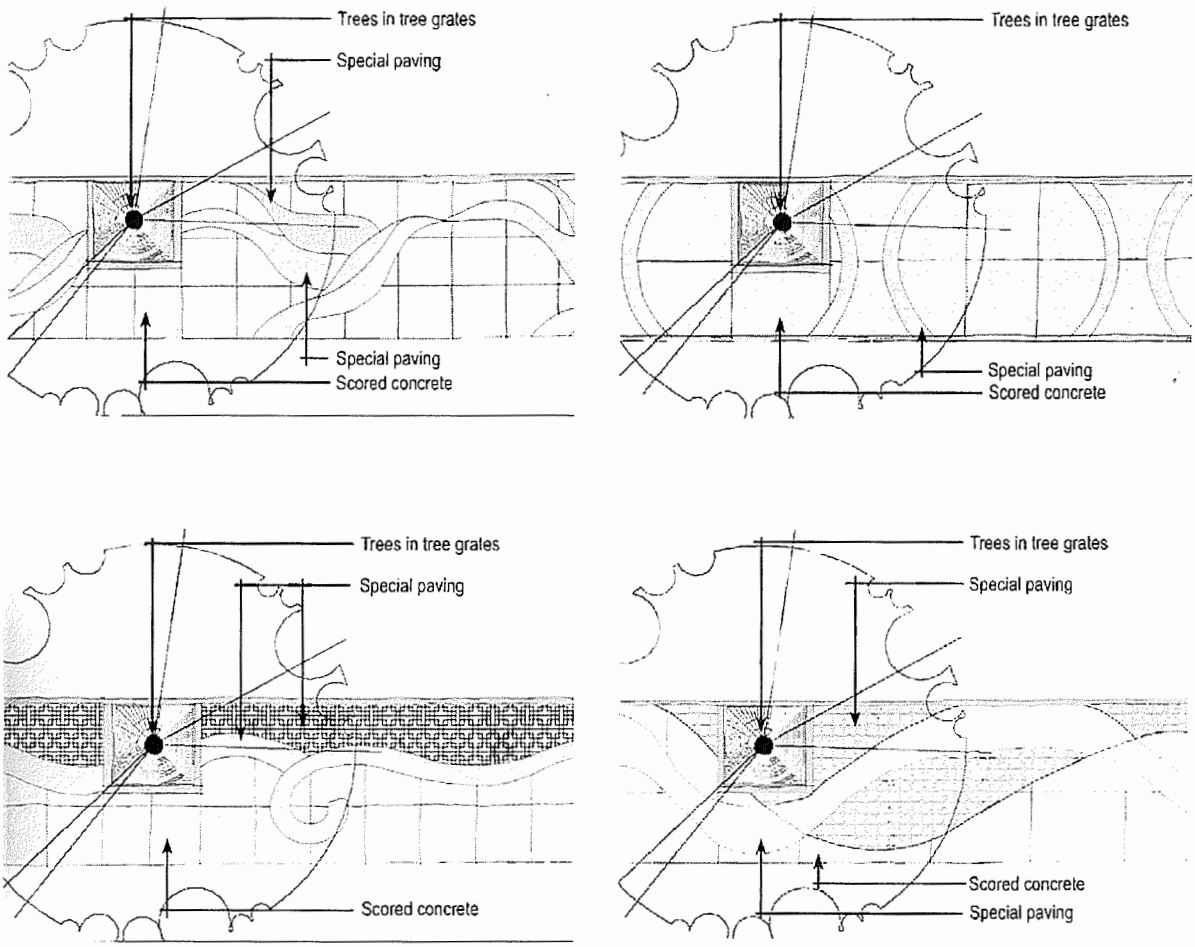
Aurora Avenue North Multimodal Corridor Project:
North 145th Street to North 165th Street

Figure 3-10
Potential Streetscape Improvements



Sample Pedestrian Area Enhancements – Conceptual Only

CITY OF SHORELINE

Aurora Avenue North Multimodal Corridor Project:
North 145th Street to North 165th Street

Figure 3-11
Optional Paving Design Concepts

also be improved because the proposed street and landscape improvements would help create visual continuity and unify the street edge by providing consistent elements along the length of the project area.

Viewer Response

Pedestrians and transit riders would likely have the most positive response to the improvements. Their experience of the visual environment would change the most because they would have the greatest exposure to all of the roadway and streetscape improvements. Pedestrians and transit riders would be able to see the special treatment on the sidewalks. The street trees and vegetation in the amenity zone not only would add visual interest but also would serve as a 4-foot-wide buffer between pedestrians and traffic. Transit riders would have visually interesting shelters and pedestrians would have distinctive and clearly identifiable crossings.

Vehicle occupants would also likely have a positive response to the improvements. As vehicle occupants enter the project area, they would see a more unified environment; the visual clutter created by utility lines and the unclear street edge would be replaced with a raised and continuous sidewalk and trees defining the street edge, as depicted in Figure 3-12. These trees would be particularly interesting during the autumn when the leaves change color.

Residents would experience benefits similar to those of vehicle occupants: the removal of utility lines would reduce the visual clutter and the street trees would provide visual interest.

Visual Impact

Alternative A would have a positive impact on the visual quality of the project area.

Alternative B

The elements under Alternative B, like those under Alternative A, that would have the greatest impact on visual quality would be the streetscape improvements. Streetscape improvements provided under Alternative B, however, would be less extensive than those under Alternative A. Alternative B would not include the 4-foot-wide amenity zone, so street trees and other landscape amenities would not line the roadway. Furthermore, Alternative B would include more left-hand turn lanes than Alternative A, which would mean less area would be available for trees and other landscaping in the median.

Visual Change

Table 3-40 presents a matrix that summarizes the visual quality impact of Alternative B quantitatively.

Improvements under Alternative B would not increase the vividness of the project area as much as the improvements under Alternative A. Without trees framing the roadway, a substantial vertical visual element would be missing. The visual intactness of the project area would also improve under Alternative B because utility lines would be placed underground, eliminating existing streetscape features that add to the visual clutter of the project area. Visual unity would improve under Alternative B but not to the extent that it would under Alternative A. Alternative B would not have street trees defining the street

edge; trees would only be clustered tree in the median. The continuous sidewalks, however, would help create unity.

Viewer Response

Under Alternative B, pedestrians and transit riders would likely have the most positive response to the improvements; however, their response would not be as positive as it would be under Alternative A because there would be fewer streetscape amenities under Alternative B.

Vehicle occupants would also likely have a positive response to the improvements, but their response would not be as positive as their response under Alternative A. As vehicle occupants enter the project area, they would see less visual clutter because utilities would be placed underground and the street edge would be defined by a continuous sidewalk area. However, they would see trees clustered only in the median, which would be less interesting than the amenity zone proposed under Alternative A.

Residents also would experience fewer benefits from Alternative B than from Alternative A. The removal of utility lines would reduce visual clutter, but there would be fewer trees and other landscaping elements under Alternative B to provide visual interest.

Visual Impact

Alternative B would have a positive impact on the visual quality of the project area, but that impact would be less than that caused by Alternative A.

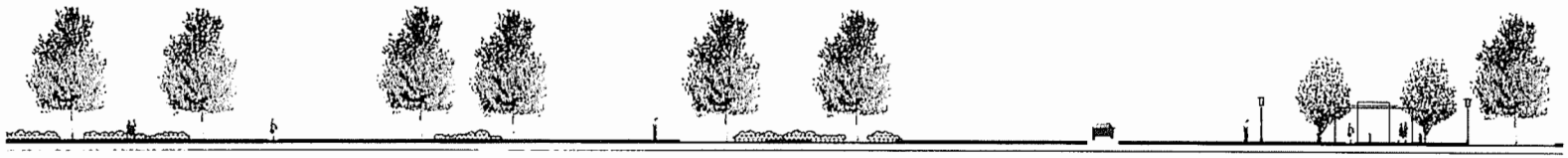
Secondary and Cumulative Impacts

Secondary impacts are impacts that are caused by the project but occur later in time or at a greater distance from the project area than primary impacts.

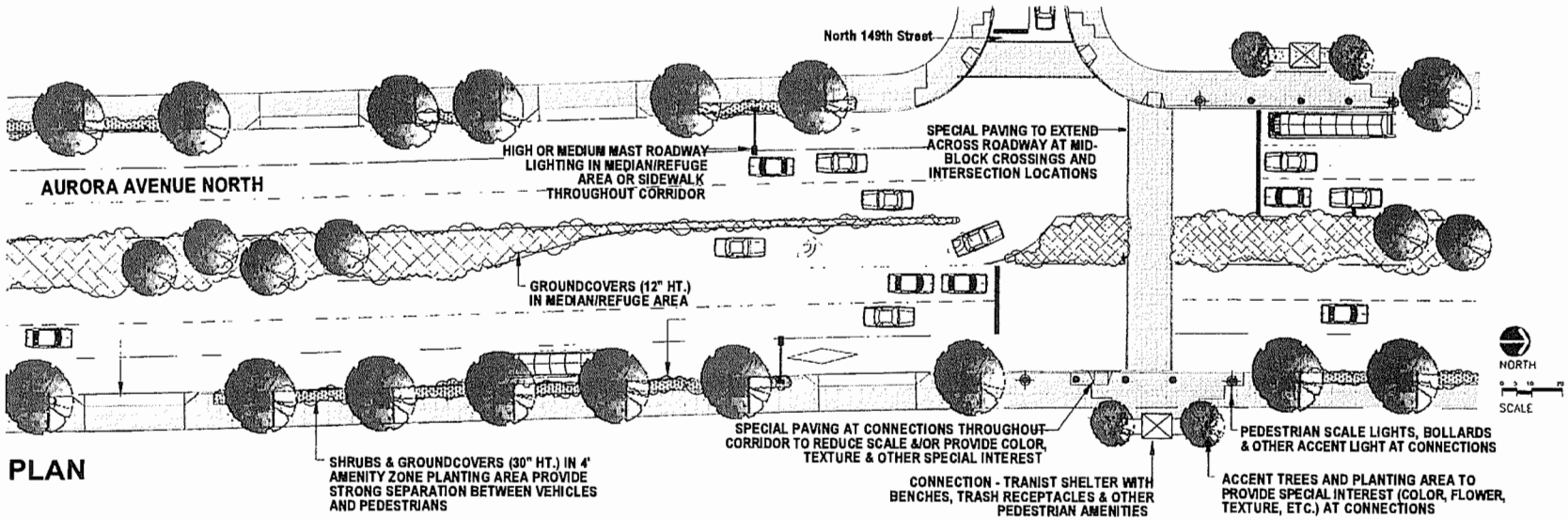
Cumulative impacts result from incremental and other additional actions. Three proposed projects could combine with the Aurora Corridor Project to cause cumulative impacts: the future improvements along Aurora Avenue North from North 165th Street to North 205th Street, the Interurban Trail project, and the Shoreline Pedestrian Safety Demonstration project.

Improvements similar in purpose to those of the Aurora Corridor Project are planned for Aurora Avenue North from the current project's northern terminus (vicinity of North 165th Street) to the vicinity of North 205th Street. The proposed streetscape improvements (such as increased sidewalk width, median and amenity-zone plantings, paving treatments, and lighting) would complement those of the existing project. The plantings north of North 165th Street would extend the visual continuity and interest created by the Aurora Corridor Project. The cumulative impacts of the two projects would likely be positive.

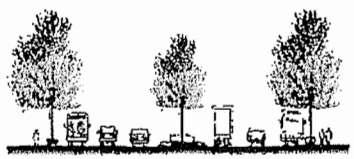
Within the Aurora Corridor Project, the Interurban Trail improvements would provide visual interest and unity at its intersection with Aurora Avenue North and North 155th Street. A future trail bridge north of North 155th Street, however, could interrupt the sightline of trees along the roadway. Like the North 165th Street to North 205th Street Aurora Avenue improvements, the Interurban Trail would continue and improve the visual quality of the area north of the project.



ELEVATION



PLAN



SECTION

CITY OF SHORELINE

Aurora Avenue North Multimodal Corridor Project
North 145th Street to North 165th Street

Figure 3-12
Potential Streetscape
High Pedestrian Areas

To the extent that the streetscape improvements proposed for the Shoreline Pedestrian Safety Demonstration project complement the improvements proposed for the Aurora Corridor Project, the cumulative impacts would be positive. If the streetscape improvements do not conform to the Aurora Corridor Project, negative cumulative impacts could result because the visual unity of the project area would be disrupted.

Taken together the projects should increase the visual quality along Aurora Avenue North. As long as the improvements proposed under the individual projects complement those of the other projects, changes to the area's visual quality would be positive and unity would be improved. The design review process would provide an opportunity to ensure consistency.

Mitigation Measures

Mitigation is required only for light and glare impacts that could occur during construction. Light and glare impacts would be mitigated by shielding roadway lighting to ensure that light sources are not directly visible from residential areas and local streets. Furthermore, construction adjacent to residential areas would be subject to noise regulations, which are designed to minimize nighttime disturbance. As a result, construction activities would end daily at such a time that the need for nighttime construction lights would not be necessary or would occur during a limited period of time.

Methodology

The following documents were consulted to assist in developing the hazardous materials section:

- SR 99 Multimodal Corridor North 145th Street to North 165th Street, Shoreline, WA EDR Radius Report (EDR, February 2002a)
- Washington State Department of Transportation (WSDOT), Environmental Procedures Manual M 31-11 (WSDOT, July 2001)
- Federal Highway Administration (FHWA) Technical Advisory T6640.8A (1987) and Supplementary Hazardous Waste Guidance (FHWA, 1997), and Hazardous Wastes in Highway Rights-of-Way (1994)

The methodology is based partly on standard guidelines developed by WSDOT and FHWA for the preparation of environmental documentation. Information from environmental regulatory agency databases was obtained through the use of a geographically indexed database search. The findings are plotted on the maps of the project area that are presented in the exhibit at the end of this section.

Data Sources

Environmental agency records were obtained from Environmental Data Resources (EDR), Inc., database service that searches current federal and state environmental agency databases. This information is assumed to be accurate; the accuracy of the databases was not independently verified. The data sources for this section of the EA/DEIS include state and federal environmental agency records, including the following:

- Federal NPL Site List and CERCLIS List
- Federal RCRA TSD Facilities List
- Federal RCRA TSD Generators List
- Federal ERNS List
- Federal PADs List
- Washington States Lists of Waste Sites Identified for Investigation or Remediation (NPL and CERCLIS Equivalents)
- Washington States Landfill or Solid Waste Site Lists
- Washington States Leaking UST Lists
- Washington States Registered UST Lists

In addition to the environmental agency database search, historical fire insurance maps (Sanborn® maps) were searched and a list of current businesses was compiled to determine if the types of businesses were likely to generate hazardous materials. The land use

categories were taken from tax records and the expected uses were assumed from the business names (e.g., expected use from Jiffy Lube is vehicle maintenance). Fuel service stations and other commercial or industrial properties may have had activities that could generate hazardous materials or substances that could impact the quality of soils, groundwater, or other environmental media.

Approach to Analysis

Information from environmental regulatory agency databases was obtained through the use of a geographically indexed database search. Findings were plotted on a map of the project area.

In this analysis, the construction impacts, operational impacts, and secondary and cumulative impacts are addressed for the alternatives. Mitigation measures are developed for the impacts identified.

The data review performed to evaluate the impacts of the identified alternatives is not intended to replace project-specific evaluations, to constitute an Initial Site Assessment (ISA), Phase I environmental site assessment (ASTM 1527 E), or equivalent, or to evaluate sites for compliance with environmental or other regulations pertaining to hazardous materials.

Affected Environment

Summary of Standard Federal and State Environmental Record Review

This section summarizes the information obtained from the search of environmental regulatory agency databases (EDR, 2002a). Additional information on these sites is included in the data report presented in the exhibit that follows this section.

Federal NPL Site List and CERCLIS List

There were no National Priority List (NPL) or CERCLIS sites identified within the searched area.

Federal RCRA TSD Facilities List

There were no RCRA TSD facilities or R CRA Corrective Action sites identified within the search area.

Federal RCRA Generators List

There are nine RCRA small quantity generators (SQGs) of hazardous waste identified within the SR 99 corridor (see Table 3-41). SQGs generate less than 100 kilograms (kg) per month of non-acute hazardous waste. There are an additional 17 RCRA SQGs within 0.25 mile of the corridor (see the exhibit that follows this section). There were no RCRA large quantity generators (LQGs) of hazardous waste identified within the search area. LQGs generate at least 1,000 kg/month of non-acute hazardous waste or 1 kg/month of acutely hazardous waste.

Table 3-41
RCRA Small Quantity Generators Within Corridor

Site Name	Address	EDR Map ID
Aurora Mitsubishi	16015 Aurora Avenue North	B
Circle K/BP	16032 Aurora Avenue North	C
HC Auto Care Inc	14720 Aurora Avenue North	D
Earl Scheib	14700 Aurora Avenue North	D
Pepper Hill Shopping Center	14701 Aurora Avenue North	D
Magic Cleaners Laundry	14701 Aurora Avenue North	D
Suspected Drug Lab (Dick Storey)	NE corner of North 165th Street and Aurora Avenue North	20
Moris Painting	14540 Aurora Avenue North	E
U-Haul	16503 Aurora Avenue North	F

Federal ERNS List

There is one site near the corridor, 15736 Greenwood Avenue North, with an Emergency Response Notification System (ERNS) record within the searched area. ERNS is a U.S. Environmental Protection Agency (EPA) database used to track information on reported releases of oil and hazardous substances.

Federal PADS List

There is one site just north of the project corridor, Hooper Electric, 16715 Aurora Avenue North, that is on EPA's PCB Activity Database (PADS). The database includes generators, transporters, commercial storers and brokers, and disposers of PCBs.

Washington State Confirmed or Suspected Contaminated Sites List

There is one Confirmed or Suspected Contaminated Sites List (CSCSL) site within the project corridor: Magic Cleaners Laundry, 14701 Aurora Avenue North (Map ID "D"). The database information indicates that petroleum products have been confirmed at concentrations less than MTCA cleanup standards. The Washington State Department of Ecology (Ecology) has received a Final Independent Remedial Action Report and the site has not been assessed for risk to human health and the environment.

Sites on the CSCSL may pose a higher risk to human health and the environment than sites in most other databases because a release to the environment already has occurred or is strongly suspected to have occurred. Six additional CSCSL sites within approximately 0.5 mile of the corridor were identified and are listed in Table 3-42.

Table 3-42
CSCSL Sites Within 0.5 Mile of Corridor

Site Name	Address	Site Information	EDR Map ID
Laurelhurst Oil Co	14334 Linden Avenue North	Confirmed soil and suspected groundwater and surface water contamination by petroleum products; site ranked 4 risk (1 highest risk to human health and environment, 5 lowest risk); awaiting remedial action.	I
EZ Auto Body Used Car Lot	14135 Aurora Avenue North	Confirmed soil contamination by petroleum products and metals/ cyanide. Contamination reported treated, removed, or contained. Final Independent Remedial Action Report received by Ecology. Ecology's determination not reported.	K
Meridian Landfill	North 170th Street and Meridian Avenue North	Suspected soil contamination by halogenated organics, metals/ cyanide, pesticides, PAHs. Site has not been ranked for risk or assessed.	67
Burke Property	17248 Ronald Place North	Confirmed soil and suspected groundwater and surface water contamination by halogenated organics, metals/cyanide, petroleum products, non-halogenated solvents. Site is undergoing independent remedial action, assessment and interim remedial actions completed.	68
Proposed Top Food & Drug	North 175th Street and Ronald Place North	Confirmed soil contamination by petroleum products. Final independent remedial action report received. Ecology's determination not reported.	69
Unocal	1150 North 175th Street	Confirmed soil and groundwater contamination by petroleum products. Independent Site Assessment of Interim Remedial Action Report received. Ecology's determination not reported.	70

There are an additional three sites identified on the Washington State Independent Cleanup Report (ICR) list within the project corridor (Table 3-43) and six others within 0.25 mile of the corridor (Table 3-44). These include sites where reports on site cleanup actions have been received by Ecology. These cleanup actions were conducted independently by the owners or operators at these sites and may not have approval from Ecology.

Table 3-43
ICR Sites Within Corridor

Site Name	Address	Site Information	EDR Map ID
Chevron	15510 Aurora Avenue North	Interim Cleanup Report received by Ecology 3/94. Contaminants are petroleum products in soil from a tank release.	A
Car Wash Enterprises (same address as Circle K/BP Oil	16032 Aurora Avenue North	Final Cleanup Report received by Ecology 10/97. Contaminants are petroleum products in soil from a tank release.	C
U-Haul	16503 Aurora Avenue North	Final Cleanup Report received by Ecology 12/93. Contaminants are petroleum products in soil from a tank release.	F

Table 3-44
ICR Sites Within 0.25 Mile of Corridor

Site Name	Address	Site Information	EDR Map ID
Unocal	16510 Aurora Avenue North	Interim Cleanup Report received by Ecology 8/94. Contaminants are petroleum products in soil from a tank release.	F
First Interstate Property	16622 Aurora Avenue North	Interim Cleanup Report received by Ecology 9/91. Contaminants are petroleum products in groundwater from a tank release.	H
Laurelhurst Oil Co	14334 Linden Avenue North	Interim Cleanup Report received by Ecology 7/91, 8/91, and 12/91. Contaminants are petroleum products in soil from a tank release. Also on CSCSL.	I
Black Jack Café	16716 Aurora Avenue North	Final Cleanup Report received by Ecology 1/96. Contaminants are petroleum products in soil from tank release.	J
Car-Fi Stereo	16724 Aurora Avenue North	Interim Cleanup Report received by Ecology 12/92. Contaminants are petroleum products in soil from a tank release.	J
EZ Auto Body Used Car Lot	14135 Aurora Avenue North	Final Cleanup Report received by Ecology 1/2000. Contaminants are petroleum products in soil from tank release. Also on CSCSL.	K

Washington State Landfill or Solid Waste Site Lists

No sites located within the project corridor were identified on the Solid Waste Facility Database. However, some of the sites identified on other databases are landfill sites (e.g., Meridian Landfill).

Washington State Leaking UST Lists

There are four leaking underground storage tank (LUST) sites identified within the project corridor. Information on these sites is shown in Table 3-45. An additional five LUST sites were identified within about 0.25 mile of the project corridor (see Table 3-46).

Table 3-45
Leaking Underground Storage Tank Sites Within Corridor

Site Name	Address	Site Information	EDR Map ID
Chevron	15510 Aurora Avenue North	Release date 4/12/90; soil affected; cleanup started.*	A
U-Haul	16503 Aurora Avenue North	Release date 12/02/93; soil affected; reported cleaned up 6/01/95.	F
Tosco/Unocal	16510 Aurora Avenue North	Release date 07/22/94; soil affected; awaiting cleanup.	F
Aurora Texaco	14507 Aurora Avenue North	Release date 11/09/89; soil affected; cleanup started.*	E

*The status of this property will be confirmed during the Initial Site Assessment.

Table 3-46
Leaking Underground Storage Tank Sites Within 0.25 Mile of Corridor

Site Name	Address	Site Information	EDR Map ID
60 Minute Tune	16622 Aurora Avenue North	Release date 7/29/91; soil affected; reported cleaned up 6/95.	H
Laurelhurst Oil Co.	14334 Linden Avenue North	Release date 3/28/91; soil affected; reported cleaned up 4/2000. Also on CSCSL, ICR list.	I
Black Jack Café	16716 Aurora Avenue North	Release date 4/7/93; soil affected; reported cleanup up 1/96. Also on ICR list.	J
Rossoe, Inc. (Miller Plan)	16724 Aurora Avenue North	Release date 1/14/92; soil affected; cleanup started, unknown status as of 6/95*	J
EZ Auto Buy Used Car Lot	14135 Aurora Avenue North	Release date 1/6/2000; soil affected; reported cleaned up 1/6/2000. Also on CSCSL and ICR list.	K

*The status of this property will be confirmed during the Initial Site Assessment.

Washington States Registered UST Lists

There are 10 registered underground storage tank (UST) sites identified within the corridor. Tank information that was included in the database is presented in Table 3-47. Sites with registered USTs within approximately 0.25 mile of the corridor are listed in Table 3-48.

Table 3-47
Underground Storage Tank Sites Within Corridor

Site Name	Address	Tank Descriptions	EDR Map ID
Chevron	15510 Aurora Avenue North	3 tanks operational, 10-20,000 gallon	A
Shoreline Shell	15544 Aurora Avenue North	4 tanks removed	A
Sears	15711 Aurora Avenue North	2 tanks removed, 1 tank exempt	5
Basic Transportation Inc.	15225 Aurora Avenue North	5 closed in place	6
Columbus RV & Marine Inc.	16015 Aurora Avenue North	1 tank unknown status	B
Circle K/BP Oil	16035 Aurora Avenue North	3 tanks removed; 5 tanks operational: 4@ 10-20,000 gallon, 1 @20-30,000 gallon	C
Q Lube	14710 Aurora Avenue North	3 tanks in closure process, <10,000 gallon	D
U-Haul	16503 Aurora Avenue North	4 tanks removed	F
Tosco Corporation (Unocal)	16510 Aurora Avenue North	4 tanks operational: 3 @10-20,000 gallons (1 diesel, 2 unleaded gas), 1 used/waste oil < 1,100 gallons	F
Aurora Texaco	14507 Aurora Avenue North	5 tanks removed (leaded, unleaded gas, used/waste oil), 1 exempt (heating oil)	E

Table 3-48
Underground Storage Tank Sites Within 0.25 Mile of Corridor

Site Name	Address	Tank Descriptions	EDR Map ID
Arthur Church	14512 Whitman Avenue North	1 tank leaded gas removed, 1 tank exempt	31
60 Minute Tune	16622 Aurora Avenue North	1 tank removed used/waste oil	H
Laurelhurst Oil Co.	14334 Linden Avenue North	6 tanks operational 10-20,000 gallon (5 heating fuel, 1 diesel)	I
Blackjack Café	16716 Aurora Avenue North	2 tanks removed	J
Hooper Electric	16715 Aurora Avenue North	1 tank removed leaded gas	J
Rossoe, Inc./Miller Plant	16715 Aurora Avenue North	3 tanks in closure process	J
National Food Corporation	16740 Aurora Avenue North	2 tanks closed in place, 1 tank exempt	J
EZ Auto Buy Used Car Lot	14135 Aurora Avenue North	2 tanks removed: 1 <1,100 gallon used/waste oil, 1 5-10,000 gallon unleaded gas	K

Summary of Historical Map and Current Business Review

Historical fire insurance map (Sanborn® maps) records are used to obtain information on former industrial, commercial, and residential uses. These historical maps often contain information about historical aboveground and underground fuel storage tanks. There are no Sanborn® maps on record for the project area (EDR, 2002b).

A list of current businesses was reviewed for property with expected right-of-way acquisition for the two build alternatives to determine if the land uses for these businesses were likely, or may have been likely in the past, to generate hazardous materials. The land uses likely to generate hazardous materials are based on the Environmental Procedures Manual Table 447-3 (WSDOT, July 2001). The results are presented in Tables 3-49 and 3-50. A number of land uses, such as motor vehicle maintenance facilities and fuel service stations, are considered to be likely to generate hazardous materials or hazardous substances.

Environmental Consequences

Construction Impacts

Potential construction impacts are identified for both build alternatives, Alternatives A and B. Construction impacts include releases of contaminants to the environment by ground-

Table 3-49 Alternative A -- Survey of Land Uses					
Business Name	Total Area (square feet)	Right-of-Way Take (square feet)	% Take of Total	Land Use	Land Use Likely to Generate Hazardous Materials?[1]
Earl Scheib	14798	714	4.8%	COM	Yes
Shurgard	274066	3,018	1.1%	IND	No
Brake Stop	10975	83	0.8%	COM	Yes
Jiffy Lube	11226	95	0.8%	COM	Yes
Enterprise	23011	183	0.8%	COM	Yes
Quest Inn	23026	604	2.6%	COM	No
Pepperhill/Care Plus	84096	2,363	2.8%	COM	No
Hideaway Card Room	23027	569	2.5%	COM	No
Pho Thanh	16812	561	3.3%	COM	No
Start Mart	12183	847	7.0%	COM	No
Restaurant Supply	73684	1,284	1.7%	COM	No
Goldies	51158	317	0.6%	COM	No
Parkwood Plaza	224370	365	0.2%	COM	No
Aurora Vision	15952	254	1.6%	OFF	No
Safeway	129870	48	0.0%	COM	No
Taco Bell	33987	940	2.8%	COM	No
Goldies Management	10233	305	3.0%	OFF	No
Vacant	60306	123	0.2%	VAC	No
Seattle Ski Rental	14688	1,029	7.0%	COM	No
Enterprise	15104	1,115	7.4%	COM	Yes
Car Connection/Sun Insurance	20113	0	0.0%	COM	No
Allstate/Pho Ha	19722	0	0.0%	COM	No
Maddy's Automotive	16041	70	0.4%	COM	Yes
McDonalds	42326	0	0.0%	COM	No
Westover Plaza	70848	0	0.0%	COM	No
Pizza Hut	10001	2,450	24.5%	COM	No
Vacant	252043	0	0.0%	VAC	No
Deals on Wheels	7795	312	4.0%	COM	Yes
Vacant	4325	0	0.0%	VAC	No
Shoreline Family Auto	26667	0	0.0%	COM	Yes
Big Ed's Auto	6667	0	0.0%	COM	Yes
Chevron	38248	1,352	3.5%	COM	Yes
Paper Zone	30385	2,859	9.4%	COM	No
AMT	28606	461	1.6%	COM	No
76 Station	56627	260	0.5%	COM	Yes
Sarahs Auto	17831	0	0.0%	COM	Yes
Vacant	34885	0	0.0%	VAC	No
Vons Square	32982	0	0.0%	COM	No
Taiho	22556	68	0.3%	COM	No
Electronics/Dan's Produce	22369	307	1.4%	COM	No
Halecrest Vet Hospital	31175	646	2.1%	COM	No
European Motors	76781	1,828	2.4%	COM	Yes
Four Seasons/Shay's	17473	458	2.6%	COM	No
Seattle Times	35711	62	0.2%	OFF	No
Arden Rehabilitation	116336	169	0.1%	RES	No

[1] Based on Table 447-3, WSDOT Environmental Procedures Manual M 31-11, July 2001, for land uses. Information on presence or absence of hazardous building materials not available.

Table 3-50 Alternative B -- Survey of Land Uses					
Business Name	Total Area (square feet)	Right-of-Way Take (square feet)	% Take of Total	Land Use	Land Use Likely to Generate Hazardous Materials?[1]
Start Mart	12,183	350	2.9%	COM	No
Pho Thanh	16,812	40	0.2%	COM	No
Hideaway Card Room	23,027	23	0.1%	COM	No
Pepperhill/Care Plus	84,096	0	0.0%	COM	No
Walgreens	no sq ft calc.	0	0.0%	COM	No
Shurgard	274,066	1356	0.5%	IND	No
Earl Scheib	14,798	216	1.5%	COM	Yes
Jiffy Lube	11,226	0	0.0%	COM	Yes
Brake Stop	10,975	0	0.0%	COM	Yes
Shurgard	274066	1222	0.4%	IND	No
Quest Inn	23,026	0	0.0%	COM	Yes
Enterprise	23,011	256	1.1%	COM	Yes
Enterprise	15,104	435	2.9%	COM	Yes
Seattle Ski Rental	14,688	343	2.3%	COM	No
Vacant	60,306	852	1.4%	VAC	Yes
Restaurant Supply	73,684	2240	3.0%	COM	No
Aurora Vision	15,952	305	1.9%	OFF	No
Westover Plaza	70,848	0	0.0%	COM	No
McDonalds	42,326	0	0.0%	COM	No
Taco Bell	33,987	62	0.2%	COM	No
Goldies	51,158	0	0.0%	COM	No
Goldies Management	10,233	134	1.3%	OFF	No
Parkwood Plaza	224370	101	0.0%	COM	No
Maddy's Automotive	16,041	70	0.4%	COM	Yes
Allstate/Pho Hoa	19,722	0	0.0%	COM	No
U-Grill	19722	0	0.0%	COM	No
Car Conn/Sun Insurance	20,113	0	0.0%	COM	No
Safeway	129,870	0	0.0%	COM	No
Pizza Hut	10,001	1677	16.8%	COM	No
Paper Zone	30,385	1460	4.8%	COM	No
Chevron	38,248	0	0.0%	COM	Yes
Big Ed's Auto	6,667	0	0.0%	COM	Yes
Shoreline Family Auto	26,667	0	0.0%	COM	Yes
Deals on Wheels	7,795	0	0.0%	COM	Yes
Four Seasons/ Shay's	17,473	60	0.3%	COM	No
European Motors	76781	1828	2.4%	COM	Yes
AMT	28,606	0	0.0%	COM	No
76 Station	56,627	0	0.0%	COM	Yes
Brown Bear	56,627	0	0.0%	COM	Yes
Sarahs Auto	17,831	0	0.0%	COM	Yes
Halecrest Vet Hospital	31,175	108	0.3%	OFF	No
Electronics/Dan's Produce	22,369	36	0.2%	COM	No
Taiho	22,556	131	0.6%	COM	No
Vons Square	32,982	0	0.0%	COM	No
Vacant	34885	0	0.0%	VAC	No
Seattle Times	35,711	62	0.2%	OFF	No
Arden Rehabilitation	116,336	118	0.1%	RES	No

[1] Based on Table 447-3, WSDOT Environmental Procedures Manual M 31-11, July 2001, for land uses. Information on presence or absence of hazardous building materials not available.

disturbing or dewatering activities. Based on a review of environmental agency information, potential types of hazardous substance contamination that could be encountered during project construction include primarily petroleum-contaminated soil and groundwater, but other contaminants, such as volatile organic compounds and PCBs, are also identified in environmental media. If this contamination is not managed properly in accordance with existing regulations, there is a potential impact to human health and ecological receptors. The sites identified within the project corridor are "reasonably predictable" sites where the nature of the contamination or potential contamination is available from files at Ecology. Reasonably predictable sites are typically small to medium in size, the potential contaminants are not extremely toxic or difficult to treat, and probable remediation approaches are straightforward. Examples of sites generally classified as "reasonably predictable" are fuel service stations and automobile repair shops (WSDOT, July 2001; FHWA, 1997). Therefore, potential construction impacts are not anticipated to be substantial.

It is not expected that the construction associated with the build alternatives will include any demolition of buildings or structures. However, hazardous materials such as asbestos, lead-based paint, and PCBs may be present in some of the structures and if changes in the design make demolition of structures necessary, there is the potential that these hazardous materials could be released during demolition. If such a release were to occur, it could potentially have an impact on human health and the environment. Initial Site Assessments would be conducted, in part, to assist in identifying unregistered sites.

Both build alternatives include relocating aboveground utilities to belowground utility corridors. Aboveground electrical utilities may include transformers that contain PCBs, and the release of PCBs during their removal could potentially impact human health and the environment.

USTs and LUSTs have been identified in agency databases for areas adjacent to the areas for the build alternatives. In addition, unidentified or abandoned USTs may also be present. Construction of the alternatives, particularly locating underground utilities, may require excavation that could encounter USTs or the piping associated with them. If the tanks or piping are disturbed during excavation, a release of hazardous materials or substances could occur and could potentially result in impact to human health and the environment.

The results of the search of the regulatory database indicate that there are sites within the project corridor that are undergoing cleanup, but it is not indicated that they have received a no further action (NFA) notice from Ecology. There were additional sites within 0.25 mile of the project corridor that have identified groundwater contamination. During construction of the build alternatives, an uncontrolled hazardous substance might be encountered in (1) areas with known contamination, (2) areas where recorded activities such as hazardous waste generation or storage of fuel in USTs could potentially have impacted soils or groundwater, or (3) other areas not identified in the environmental database search. The possible environmental impacts of encountering an uncontrolled hazardous substance might include the following:

- Potential release of contaminated air emissions (dust and volatile organic compounds), soil, surface water, and groundwater during construction

- Potential alteration of contaminated groundwater plume(s) and generation of contaminated water during dewatering activities
- Potential alteration of contaminant migration pathways due to excavation and other construction activities

These potential impacts can be avoided by following the mitigation measures listed in this section.

An additional potential impact common to the construction of the two build alternatives would be the release of a hazardous substance from construction equipment during construction. For example, fuels and oils needed for heavy equipment operation and maintenance might be spilled within the project area, a hazard common to all construction projects. Cleanup of the spilled material and the disposal of wastes from the cleanup (e.g., contaminated soil) might add additional time and costs to construction operations. Large spills of hazardous materials during construction might also require intervention by an emergency response agency.

The potential construction impacts of the two build alternatives are similar. However, Alternative A includes a wider right-of-way than Alternative B. Therefore, if contamination is encountered during construction, there is the potential that a greater area would be impacted under Alternative A than under Alternative B.

Operational Impacts

No Action Alternative

If the project is not constructed, there would be no expected operational impacts.

Impacts Common to All Alternatives

There is the potential for release to the environment of hazardous substances used or transported during routine operation and maintenance of roadways.

If cleanup alternatives selected for the identified contaminated sites in or adjacent to the project corridor include long-term onsite treatment of soils or groundwater, there is the potential that contamination may be present at the time of acquisition of right-of-way for the project. This could result in transfer to the project owner of the liability for risk to human health for persons on the site and risk to the environment. Similarly, if contamination remains present after construction on or adjacent to the right-of-way and contaminant migration pathways are altered by construction of underground utility corridors, operation of the utility corridors could result in risk to human health and the environment. The acquisition of an easement or title to properties with potential environmental contamination could create significant long-term environmental liability or management concerns. Longer-term environmental liabilities might include financial responsibility for cleanup of onsite contamination or for remediation activities necessitated by offsite migration of hazardous substances.

The potential operational impacts of Alternative A and Alternative B are substantially similar.

Secondary and Cumulative Impacts

Secondary Impacts

A secondary impact that could occur as a result of the roadway being able to handle more traffic volume is an increase in incidental spills of hazardous materials being transported on Aurora Avenue North or the major arterials.

Cumulative Impacts

Two projects—the Shoreline Interurban Trail and the future improvements along Aurora Avenue North from North 165th Street to North 205th Street—were identified as potentially having impacts in combination with those of the Aurora Corridor Project.

Cumulative impacts considered include the effects of planned commercial or light industrial development along Aurora Avenue North. Any additional construction has the potential to encounter contamination from hazardous substances from past or current activities (e.g., fuel USTs for heating of residences and commercial facilities) and hazardous building materials (e.g., asbestos and lead-based paint). If such contamination is not managed properly in accordance with existing regulations, there would be the potential for impact to human health and ecological receptors. In addition, increased traffic and the operations of industrial development and commercial development, in which businesses might handle hazardous substances, has the potential to impact the environment through increased generation of hazardous wastes and possible releases of toxics to air or water.

Mitigation Measures

Mitigation measures can be taken to control, mitigate, or eliminate the potential impacts discussed in the previous sections. Environmental regulations in place require the appropriate management of contaminated media such as soil and groundwater, require strict control and management of hazardous wastes, and establish criteria for transportation of hazardous substances.

Mitigation measures for identified potential impacts would include the following:

- Acquire additional information regarding the nature and extent of contamination at the identified sites (including depth to groundwater) and the site cleanup status. This information can be obtained through a request to research Ecology site files.
- Conduct Initial Site Assessments (ISAs) or transaction screening evaluations for sites located within or adjacent to the project right-of-way. It is recommended that the ISAs include review of historical tax records located in the Puget Sound Archives to assist in identifying former site uses and to assist in locating possible unregistered USTs. If the information available is not sufficient to establish that the cleanup is complete or is not sufficient to prepare a remediation plan and cost estimate, a Preliminary Site Investigation (PSI) may be required. Findings should also be used to help manage liability during right-of-way acquisition.
- Locate USTs and fuel lines prior to construction (i.e., at the Chevron, U-Haul, Unocal 76, Texaco locations).

- Determine the presence or absence of PCBs in transformers that will be removed during relocation of overhead electrical utilities. Identified PCBs will require management in accordance with applicable regulations.
- If structures are identified for demolition, conduct a hazardous material survey to determine if asbestos-containing materials, lead-based paint, or PCBs are present in structures prior to demolition activities. If the structures to be demolished contain these substances, applicable regulations pertaining to the handling and disposal of these materials would be followed. An approved contractor would be designated to conduct the abatement portion of the demolition for the buildings that contain asbestos or lead-based paint. Regular onsite inspection would increase conformance to federal, state, and local regulations and guidelines.
- If necessary, schedule construction activities in concert with any needed cleanup activities to avoid contaminated areas.
- Implement construction techniques that minimize disturbance to the subsurface and prevent the transport of possible contaminants to uncontaminated areas. These techniques would address dewatering activities, site grading and excavation, installation of light standards, stormwater pollution prevention, and spill prevention.
- Prepare a comprehensive Contingency and Hazardous Substance Management Plan and a worker Health and Safety Plan to minimize the effects of identified and unanticipated hazardous substance impacts from contaminated soil and groundwater.

Exhibit

The EDR Radius Map
with GeoCheck®

SR99 Multimodal Corridor N145th-N165th
N 155th Street/Aurora Avenue
Shoreline, WA 98133

Inquiry Number: 739693.3s

February 27, 2002

Environmental Data Resources, Inc.

***The* Source For Environmental Risk Management Data**

3530 Post Road
Southport, Connecticut 06490

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

FORM-CUR

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The report meets the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00. Search distances are per ASTM standard or custom distances requested by the user.

TARGET PROPERTY INFORMATION

ADDRESS

N 155TH STREET/AURORA AVENUE
SHORELINE, WA 98133

COORDINATES

Latitude (North):	47.741500 - 47° 44' 29.4"
Longitude (West):	122.345300 - 122° 20' 43.1"
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	549082.6
UTM Y (Meters):	5287558.5

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property:	2447122-F3 SEATTLE NORTH, WA
Source:	USGS 7.5 min quad index

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the ASTM E 1527-00 search radius around the target property for the following databases:

FEDERAL ASTM STANDARD

NPL..... National Priority List
Proposed NPL..... Proposed National Priority List Sites
CERCLIS..... Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP..... CERCLIS No Further Remedial Action Planned
CORRACTS..... Corrective Action Report
RCRIS-TSD..... Resource Conservation and Recovery Information System

STATE ASTM STANDARD

HSL..... Hazardous Sites List
SWF/LF..... Solid Waste Facility Database

FEDERAL ASTM SUPPLEMENTAL

CONSENT..... Superfund (CERCLA) Consent Decrees
ROD..... Records Of Decision

EXECUTIVE SUMMARY

Delisted NPL..... National Priority List Deletions
HMIRS..... Hazardous Materials Information Reporting System
MLTS..... Material Licensing Tracking System
MINES..... Mines Master Index File
NPL Liens..... Federal Superfund Liens
RAATS..... RCRA Administrative Action Tracking System
TRIS..... Toxic Chemical Release Inventory System
TSCA..... Toxic Substances Control Act
FTTS..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

STATE OR LOCAL ASTM SUPPLEMENTAL

CSCSL NFA..... Confirmed & Contaminated Sites - No Further Action
EMI..... Washington Emissions Data System

EDR PROPRIETARY HISTORICAL DATABASES

Coal Gas..... Former Manufactured Gas (Coal Gas) Sites

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

Elevations have been determined from the USGS 1 degree Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. EDR's definition of a site with an elevation equal to the target property includes a tolerance of +/- 10 feet. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property (by more than 10 feet). Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

FEDERAL ASTM STANDARD

RCRIS: The Resource Conservation and Recovery Act database includes selected information on sites that generate, store, treat, or dispose of hazardous waste as defined by the Act. The source of this database is the U.S. EPA.

A review of the RCRIS-LQG list, as provided by EDR, and dated 06/21/2000 has revealed that there are 2 RCRIS-LQG sites within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
CHEVRON 200410	***15510 AURORA AVE N***	***0 - 1/8 N***	***A2***	***5***
SEARS UNIT 1059/6028/8119	***15711 AURORA AVE N***	***0 - 1/8 N***	***5***	***7***

EXECUTIVE SUMMARY

RCRIS: The Resource Conservation and Recovery Act database includes selected information on sites that generate, store, treat, or dispose of hazardous waste as defined by the Act. The source of this database is the U.S. EPA.

A review of the RCRIS-SQG list, as provided by EDR, and dated 06/21/2000 has revealed that there are 26 RCRIS-SQG sites within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
FORENTA CLOSE SYSTEM	*15407 WESTMINSTER WAY N*	*1/8 - 1/4 WSW*	*7*	*9*
AURORA MITSUBISHI	*16015 AURORA AVE N*	*1/4 - 1/2 N*	*B9*	*10*
CIRCLE K STORE 5514 BP OIL	*16032 AURORA AVE N*	*1/4 - 1/2 N*	*C10*	*10*
HC AUTO CARE INC AURORA	*14720 AURORA AVE N*	*1/4 - 1/2 S*	*D13*	*13*
EARL SCHEIB OF WASHINGTON 328	*14700 AURORA AVE N*	*1/4 - 1/2 S*	*D16*	*15*
PEPPER HILL SHOPPING CTR	*14701 AURORA AVE N PARK*	*1/4 - 1/2 S*	*D17*	*15*
MAGIC CLEANERS LAUNDRY	*14701 AURORA AVE N*	*1/4 - 1/2 S*	*D18*	*15*
SUSPECTED DRUG LAB WA	*NE COR OF N 165TH AUR*	*1/4 - 1/2 N*	*20*	*17*
MORIS PAINTING SEATTLE	*14540 AURORA AVE N*	*1/4 - 1/2 S*	*E21*	*17*
U HAUL CO OF N SEATTLE	*16503 AURORA AVE N*	*1/4 - 1/2 N*	*F26*	*21*
MEYER SIGN CO INC	*926 N 165TH ST*	*1/2 - 1 NNW*	*32*	*25*
JOHN KETOLA PAINTING INC SEATT	*14333 AURORA AVE N*	*1/2 - 1 S*	*G33*	*26*
SOUND TRUCK EQUIPMENT INC	*14325 AURORA AVE N*	*1/2 - 1 S*	*G34*	*26*
SEATTLE CITY USED OIL COLLECT	*14320 AURORA AVE N*	*1/2 - 1 S*	*G35*	*27*
EVANS TIRE SVC CTRS 066	*16622 AURORA AVE N*	*1/2 - 1 N*	*H39*	*28*
LAURELHURST OIL CO INC UST 111	*14334 LINDEN AVE N*	*1/2 - 1 S*	*I42*	*33*
DAVE GAMMAN	*14328 LINDEN AVE N*	*1/2 - 1 S*	*I44*	*34*
ROSSOE INC SEATTLE AURORA	*16716 AURORA AVE N*	*1/2 - 1 N*	*J46*	*35*
HOOPER ELEC	*16715 AURORA AVE N PO B*	*1/2 - 1 N*	*J49*	*36*
RONS CLEANERS	*16737 AURORA AVE N*	*1/2 - 1 N*	*J53*	*38*
METRO KING CNTY DOT TRANSIT DI	*2160 N 163RD ST*	*1/2 - 1 NE*	*58*	*41*
EMERALD CITY AUTO BODY INC	*14101 AURORA AVE N*	*1/2 - 1 S*	*K59*	*42*
KING CNTY SOLID WASTE DIV 1ST	*165TH MERIDIAN AVE N*	*1/2 - 1 NE*	*60*	*42*
SEATTLE PUBLIC UTILITIES BITTE	*14141 LINDEN AVE N*	*1/2 - 1 S*	*61*	*43*
DUFFY AURORA NISSAN	*14005 AURORA AVE N*	*1/2 - 1 S*	*L63*	*43*
BUG AID	*14045 MIDVALE AVE N*	*1/2 - 1 S*	*64*	*44*

ERNS: The Emergency Response Notification System records and stores information on reported releases of oil and hazardous substances. The source of this database is the U.S. EPA.

A review of the ERNS list, as provided by EDR, and dated 08/08/2000 has revealed that there are 2 ERNS sites within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
15736 GREENWOOD AVE N	15736 GREENWOOD AVE N	1/4 - 1/2 W	22	18
16510 AURORA AVE NORTH	16510 AURORA AVE NORTH	1/4 - 1/2 N	F29	23

STATE ASTM STANDARD

CSCSL: The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the Department of Ecology's Confirmed & Suspected Contaminated Sites List.

A review of the CSCSL list, as provided by EDR, has revealed that there are 7 CSCSL sites within approximately 1 mile of the target property.

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
MAGIC CLEANERS LAUNDRY	***14701 AURORA AVE N***	***1/4 - 1/2 S***	***D18***	***15***
LAURELHURST OIL CO INC	***14334 LINDEN AVE N***	***1/2 - 1 S***	***I41***	***29***
E Z AUTO BUY USED CAR LOT	***14135 AURORA AVE N***	***1/2 - 1 S***	***K56***	***39***
MERIDIAN LANDFILL	170TH N / MERIDIAN AV	1/2 - 1 NE	67	47
BURKE PROPERTY	17248 RONALD PL N	1/2 - 1 N	68	48
PROPOSED TOP FOOD & DRUG	175TH / RONALD PLACE	1/2 - 1 N	69	50
UNOCAL 4973	1150 N 175TH ST	1/2 - 1 N	70	50

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Ecology's Leaking Underground Storage Tanks Site List.

A review of the LUST list, as provided by EDR, and dated 12/07/2001 has revealed that there are 9 LUST sites within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
CHEVRON 200410	***15510 AURORA AVE N***	***0 - 1/8 N***	***A3***	***5***
UHAUL CO OF NORTH SEATTLE	***16503 AURORA AVE NORTH***	***1/4 - 1/2 N***	***F25***	***20***
TOSCO CORPORATION SITE #254725	***16510 AURORA AVE N***	***1/4 - 1/2 N***	***F27***	***22***
AURORA TEXACO	***14507 AURORA NORTH***	***1/2 - 1 S***	***E30***	***24***
60 MINUTE TUNE	***16622 AURORA NORTH***	***1/2 - 1 N***	***H37***	***27***
LAURELHURST OIL CO INC	***14334 LINDEN AVE N***	***1/2 - 1 S***	***I41***	***29***
BLACK JACK CAFE	16716 AURORA AVE N	1/2 - 1 N	J45	34
ROSSOE, INC. (MILLER PLANT)	16724 AURORA AVENUE NOR	1/2 - 1 N	J50	37
E Z AUTO BUY USED CAR LOT	14135 AURORA AVE N	1/2 - 1 S	K55	39

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Ecology's Statewide UST Site/Tank Report.

A review of the UST list, as provided by EDR, and dated 12/07/2001 has revealed that there are 23 UST sites within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
CHEVRON 200410	***15510 AURORA AVE N***	***0 - 1/8 N***	***A3***	***5***
SHORELINE SHELL	15544 AURORA AVE N	0 - 1/8 N	A4	6
SEARS UNIT 1059/6028/8119	***15711 AURORA AVE N***	***0 - 1/8 N***	***5***	***7***
BASIC TRANSPORTATION INC	15225 AURORA AVE NO	1/8 - 1/4 S	6	8
COLUMBIS RV & MARINE INC	16015 AURORA AVENUE NOR	1/4 - 1/2 N	B8	9
CIRCLE K STORE 5514 BP OIL	***16032 AURORA AVE N***	***1/4 - 1/2 N***	***C10***	***10***
STATE OF WASHINGTON DEPARTMENT	15700 DAYTON AVE N	1/4 - 1/2 WNW	12	13
Q LUBE #1502	14710 AURORA AVE N	1/4 - 1/2 S	D14	14
PINEHURST AUTO SALES	14929 WESTMINSTER WAY N	1/4 - 1/2 SW	19	16
METRO TRANSIT NORTH BASE	1241 N 165TH ST	1/4 - 1/2 N	F23	18
UHAUL CO OF NORTH SEATTLE	***16503 AURORA AVE NORTH***	***1/4 - 1/2 N***	***F25***	***20***
TOSCO CORPORATION SITE #254725	***16510 AURORA AVE N***	***1/4 - 1/2 N***	***F27***	***22***
AURORA TEXACO	***14507 AURORA NORTH***	***1/2 - 1 S***	***E30***	***24***
ARTHUR A CHURCH	14512 WHITMAN AVENUE NO	1/2 - 1 S	31	25
60 MINUTE TUNE	***16622 AURORA NORTH***	***1/2 - 1 N***	***H37***	***27***
SHORELINE COMMUNITY COLLEGE	16101 GREENWOOD AVE N	1/2 - 1 NW	40	29
LAURELHURST OIL CO INC	***14334 LINDEN AVE N***	***1/2 - 1 S***	***I41***	***29***
BLACK JACK CAFE	16716 AURORA AVE N	1/2 - 1 N	J48	35

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
HOOPER ELEC	***16715 AURORA AVE N PO B***	***1/2 - 1 N***	***J49***	***36***
ROSSOE, INC. (MILLER PLANT)	16724 AURORA AVENUE NOR	1/2 - 1 N	J52	37
NATIONAL FOOD CORPORATION	16740 AURORA AVE N.	1/2 - 1 N	J54	38
E Z AUTO BUY USED CAR LOT	***14135 AURORA AVE N***	***1/2 - 1 S***	***K56***	***39***
ARCO 4351	***14424 GREENWOOD AVE N***	***1/2 - 1 SW***	***M66***	***44***

FEDERAL ASTM SUPPLEMENTAL

FINDS: The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS.

A review of the FINDS list, as provided by EDR, and dated 10/29/2001 has revealed that there are 33 FINDS sites within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
CHEVRON 200410	***15510 AURORA AVE N***	***0 - 1/8 N***	***A2***	***5***
SEARS UNIT 1059/6028/8119	***15711 AURORA AVE N***	***0 - 1/8 N***	***5***	***7***
FORENTA CLOSE SYSTEM	***15407 WESTMINSTER WAY N***	***1/8 - 1/4 WSW***	***7***	***9***
AURORA MITSUBISHI	***16015 AURORA AVE N***	***1/4 - 1/2 N***	***B9***	***10***
CIRCLE K STORE 5514 BP OIL	***16032 AURORA AVE N***	***1/4 - 1/2 N***	***C10***	***10***
HC AUTO CARE INC AURORA	***14720 AURORA AVE N***	***1/4 - 1/2 S***	***D13***	***13***
EARL SCHEIB OF WASHINGTON 328	14700 AURORA AVE N	1/4 - 1/2 S	D15	15
EARL SCHEIB OF WASHINGTON 328	***14700 AURORA AVE N***	***1/4 - 1/2 S***	***D16***	***15***
PEPPER HILL SHOPPING CTR	***14701 AURORA AVE N PARK***	***1/4 - 1/2 S***	***D17***	***15***
MAGIC CLEANERS LAUNDRY	***14701 AURORA AVE N***	***1/4 - 1/2 S***	***D18***	***15***
SUSPECTED DRUG LAB WA	***NE COR OF N 165TH AUR***	***1/4 - 1/2 N***	***20***	***17***
MORIS PAINTING SEATTLE	***14540 AURORA AVE N***	***1/4 - 1/2 S***	***E21***	***17***
U HAUL CO OF N SEATTLE	16503 AURORA AVE N	1/4 - 1/2 N	F24	20
U HAUL CO OF N SEATTLE	***16503 AURORA AVE N***	***1/4 - 1/2 N***	***F26***	***21***
MEYER SIGN CO INC	***926 N 165TH ST***	***1/2 - 1 NNW***	***32***	***25***
JOHN KETOLA PAINTING INC SEATT	***14333 AURORA AVE N***	***1/2 - 1 S***	***G33***	***26***
SOUND TRUCK EQUIPMENT INC	***14325 AURORA AVE N***	***1/2 - 1 S***	***G34***	***26***
SEATTLE CITY USED OIL COLLECT	***14320 AURORA AVE N***	***1/2 - 1 S***	***G35***	***27***
EVANS TIRE SVC CTRS 066	16622 AURORA AVE N	1/2 - 1 N	H36	27
EVANS TIRE SVC CTRS 066	***16622 AURORA AVE N***	***1/2 - 1 N***	***H39***	***28***
LAURELHURST OIL CO INC UST 111	***14334 LINDEN AVE N***	***1/2 - 1 S***	***I42***	***33***
DAVE GAMMAN	***14328 LINDEN AVE N***	***1/2 - 1 S***	***I44***	***34***
ROSSOE INC SEATTLE AURORA	***16716 AURORA AVE N***	***1/2 - 1 N***	***J46***	***35***
HOOPER ELEC	***16715 AURORA AVE N PO B***	***1/2 - 1 N***	***J49***	***36***
RONS CLEANERS	***16737 AURORA AVE N***	***1/2 - 1 N***	***J53***	***38***
METRO KING CNTY DOT TRANSIT DI	***2160 N 163RD ST***	***1/2 - 1 NE***	***58***	***41***
EMERALD CITY AUTO BODY INC	***14101 AURORA AVE N***	***1/2 - 1 S***	***K59***	***42***
KING CNTY SOLID WASTE DIV 1ST	***165TH MERIDIAN AVE N***	***1/2 - 1 NE***	***60***	***42***
SEATTLE PUBLIC UTILITIES BITTE	***14141 LINDEN AVE N***	***1/2 - 1 S***	***61***	***43***
DUFFY AURORA NISSAN	14005 AURORA AVE N	1/2 - 1 S	L62	43

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
DUFFY AURORA NISSAN	***14005 AURORA AVE N***	***1/2 - 1 S***	***L63***	***43***
BUG AID	***14045 MIDVALE AVE N***	***1/2 - 1 S***	***64***	***44***
ARCO 4351	14424 GREENWOOD AVE N	1/2 - 1 SW	M65	44

PADS: The PCB Activity Database identifies generators, transporters, commercial storers and/or brokers and disposers of PCBs who are required to notify the United States Environmental Protection Agency of such activities. The source of this database is the U.S. EPA.

A review of the PADS list, as provided by EDR, and dated 09/30/2001 has revealed that there is 1 PADS site within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
HOOPER ELEC	***16715 AURORA AVE N PO B***	***1/2 - 1 N***	***J49***	***36***

STATE OR LOCAL ASTM SUPPLEMENTAL

ICR: These are remedial action reports Ecology has received from either the owner or operator of the site. These actions have been conducted without department oversight or approval and are not under an order or decree.

A review of the WA ICR list, as provided by EDR, has revealed that there are 10 WA ICR sites within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
CHEVRON #20 0410	15510 AURORA AVE. N.	0 - 1/8 N	A1	5
CAR WASH ENTERPRISES	16032 AURORA AVE. N.	1/4 - 1/2 N	C11	12
U HAUL CO OF N SEATTLE	***16503 AURORA AVE N***	***1/4 - 1/2 N***	***F26***	***21***
UNOCAL #4725	16510 AURORA AVE. N.	1/4 - 1/2 N	F28	23
FIRST INTERSTATE PROPERTY (TWO	16622 AURORA AVE. N.	1/2 - 1 N	H38	28
LAURELHURST OIL CO.	14331 LINDEN AVE. N.	1/2 - 1 S	I43	33
BLACK JACK CAFE	16716 AURORA AVE. N.	1/2 - 1 N	J47	35
CAR-FI STEREO	16724 AURORA AVE. N.	1/2 - 1 N	J51	37
EZ AUTO BODY USED CAR LOT	14135 AURORA AVE. N.	1/2 - 1 S	K57	41
ARCO 4351	***14424 GREENWOOD AVE N***	***1/2 - 1 SW***	***M66***	***44***

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

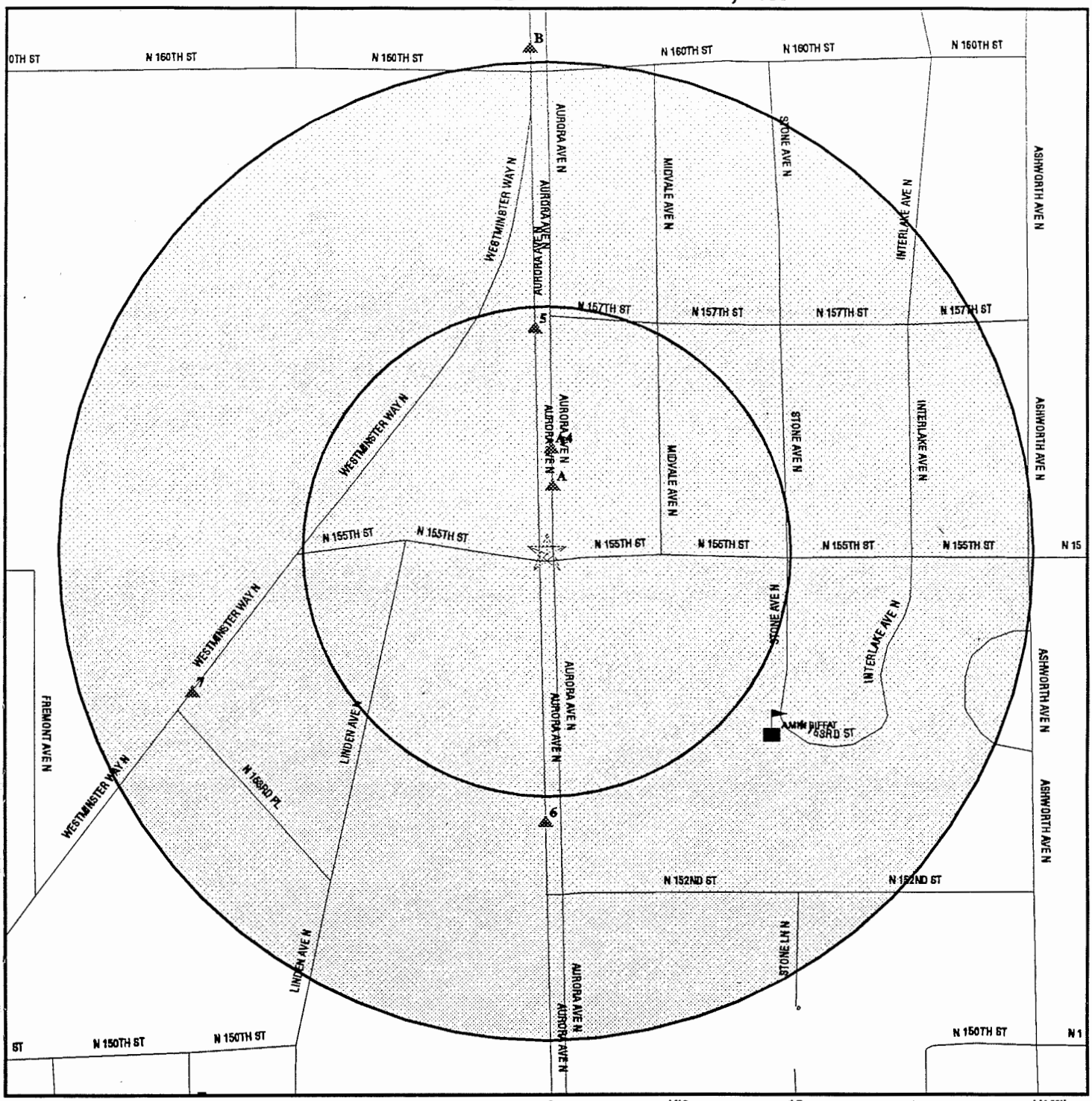
Site Name	Database(s)
KING CO - HALLER LK LDFL	CERC-NFRAP
KING CO - FIRST NE CORLISS AV) LDFL	CERC-NFRAP
EVERGREEN SCHOOL	RCRIS-SQG, FINDS
CHEVRON PT. WELLS ASPHALT PLANT	WA ICR
WSDOT	WA ICR
RICHMOND HIGHLANDS WATER TANK	WA ICR

OVERVIEW MAP - 739693.3s - CH2M Hill, Inc.

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Coal Gasification Sites
- National Priority List Sites
- Landfill Sites
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Wetlands

TARGET PROPERTY:	SR99 Multimodal Corridor N145th-N165th	CUSTOMER:	CH2M Hill, Inc.
ADDRESS:	N 155th Street/Aurora Avenue	CONTACT:	M. Allen McDermott
CITY/STATE/ZIP:	Shoreline WA 98133	INQUIRY #:	739693.3s
LAT/LONG:	47.7415 / 122.3453	DATE:	February 27, 2002 6:13 pm

DETAIL MAP - 739693.3s - CH2M Hill, Inc.



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Coal Gasification Sites
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone

TARGET PROPERTY:	SR99 Multimodal Corridor N145th-N165th	CUSTOMER:	CH2M Hill, Inc.
ADDRESS:	N 155th Street/Aurora Avenue	CONTACT:	M. Allen McDermott
CITY/STATE/ZIP:	Shoreline WA 98133	INQUIRY #:	739693.3s
LAT/LONG:	47.7415 / 122.3453	DATE:	February 27, 2002 6:14 pm

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL ASTM STANDARD								
NPL		1.000	0	0	0	0	NR	0
Proposed NPL		1.000	0	0	0	0	NR	0
CERCLIS		0.750	0	0	0	0	NR	0
CERC-NFRAP		0.750	0	0	0	0	NR	0
CORRACTS		1.000	0	0	0	0	NR	0
RCRIS-TSD		0.750	0	0	0	0	NR	0
RCRIS Lg. Quan. Gen.		0.750	2	0	0	0	NR	2
RCRIS Sm. Quan. Gen.		0.750	0	1	9	16	NR	26
ERNS		0.750	0	0	2	0	NR	2
STATE ASTM STANDARD								
CSCSL		1.000	0	0	1	6	NR	7
HSL		1.000	0	0	0	0	NR	0
State Landfill		0.750	0	0	0	0	NR	0
LUST		0.750	1	0	2	6	NR	9
UST		0.750	3	1	8	11	NR	23
FEDERAL ASTM SUPPLEMENTAL								
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
Delisted NPL		1.000	0	0	0	0	NR	0
FINDS		0.750	2	1	11	19	NR	33
HMIRS		0.750	0	0	0	0	NR	0
MLTS		0.750	0	0	0	0	NR	0
MINES		0.750	0	0	0	0	NR	0
NPL Liens		0.750	0	0	0	0	NR	0
PADS		0.750	0	0	0	1	NR	1
RAATS		0.750	0	0	0	0	NR	0
TRIS		0.750	0	0	0	0	NR	0
TSCA		0.750	0	0	0	0	NR	0
FTTS		0.750	0	0	0	0	NR	0
STATE OR LOCAL ASTM SUPPLEMENTAL								
WA ICR		0.750	1	0	3	6	NR	10
CSCSL NFA		TP	NR	NR	NR	NR	NR	0
WA Emissions		TP	NR	NR	NR	NR	NR	0
EDR PROPRIETARY HISTORICAL DATABASES								
Coal Gas		1.000	0	0	0	0	NR	0

AQUIFLOW - see EDR Physical Setting Source Addendum

TP = Target Property

NR = Not Requested at this Search Distance

* Sites may be listed in more than one database

Agency Coordination

The City of Shoreline held a meeting July 9, 1999, involving its consultant and representatives from the Washington State Department of Transportation (WSDOT) and the Federal Highway Administration (FHWA), to reach a consensus on the appropriate level of documentation for the Aurora Avenue North corridor project. Based on similar projects built in the region and the anticipated level of environmental impacts, the City proposed that an Expanded SEPA Checklist and a NEPA Documented Categorical Exclusion (CE) be completed for the 3-mile project and identified a number of initial environmental concerns. FHWA representatives noted that although the project did fit the description of a CE project under NEPA, the amount of supplemental documentation proposed was the near equivalent of the work necessary for a NEPA Environmental Assessment (EA). It was agreed that an Expanded SEPA Checklist and NEPA EA would be prepared. It was also presumed during the meeting that FHWA, would be the lead agency in the EA process.

As a follow-up to the meeting on July 9, 1999, representatives of the City and its consultant met again on July 28, 1999. Technical elements for environmental study, initially identified during the July 9 meeting, were confirmed by the City at the July 28 meeting. WSDOT and FHWA were notified of the meeting results by letter. It was decided that the EA would focus on:

- Surface water (and a resulting Biological Assessment)
- Historic properties
- Recreation
- Potential Section 4(f) Evaluation, depending on the results of the historic properties and recreation analyses
- Transportation
- Air quality
- Noise
- Social (including Environmental Justice analysis)
- Economics

In a meeting with FHWA and WSDOT representatives on December 19, 2000, regarding the environmental review process, the City proposed, and it was agreed by WSDOT and FHWA, that the corridor could be separated into separate projects. The southern project (North 145th Street to North 165th Street) would be progressed first. The rationale for documenting the project in this manner is as follows:

- The projects could be construed as "separate actions"—They have independent utility in that they would be usable and would represent a reasonable commitment of funds even if no other improvements were made to the corridor.

- It would allow for more extensive public involvement and review of issues for the northern project.
- It would allow the City to immediately rectify existing safety and mobility problems in the southern project.
- It does not negate the necessity to analyze the impacts of the full corridor in a cumulative impacts section.

During the December 19 meeting with FHWA and WSDOT representatives, a modified environmental process was planned. Based on the project definition, precedence in other jurisdictions, and the existing understanding of the anticipated insignificant level of environmental impacts in the portion of Aurora Avenue North that lies within the Aurora Corridor Project, a NEPA Documented CE appeared to be appropriate. The Documented CE would include technical memorandums on a limited number of issues—surface water drainage, relocation, transportation, Section 4(f), and cultural resources. It also would include a discussion of other alternatives that were considered and why they were rejected and a discussion of the logic for the proposed termini of the Aurora Corridor Project (North 145th Street on the south and North 165th Street on the north). A SEPA Expanded Checklist would still be prepared. The appropriate level of documentation for the northern project, although anticipated to be either an EA or Environmental Impact Statement (EIS), would be decided at a later date when the project design is better defined.

In response to public comments and to allow the maximum amount of public input, on July 9, 2001, the City, its consultant, WSDOT, and FHWA met and agreed to document the southern project in a single combined document that would serve as a SEPA EIS and NEPA EA document.

Section 106 Tribal Consultation

On November 15, 2001, WSDOT, in coordination with FHWA and the City of Shoreline, sent letters to the Suquamish and Tulalip Tribes to inform them of the Aurora Corridor Project from North 145th Street to North 165th Street and invite them to submit their concerns, 1questions, and input. Tribal response was requested by December 28, 2001. Although no response has been received from the Tribes to date, WSDOT and the City of Shoreline will continue to contact both Tribes by letter or telephone in a good faith effort to solicit their input. Any responses from the Tribes, as well as a list of their comments and concerns, will be published in the Final EIS.

Washington State Office of Historical Preservation Consultation

Staff archaeologists with CH2M HILL conducted a field survey of the project area to determine whether properties eligible for listing on the State or Federal Register of Historic Places are present in the project area, and whether the project could impact those properties. As documented in the Historic and Archaeological Resources Discipline Report (CH2M HILL, 2001), CH2M HILL made a preliminary determination that although some sites in the corridor had historic connections, none would be eligible for listing. On November 15, 2001, WSDOT mailed this report to the State Historic Preservation Officer at the Washington State Office of Historical Preservation for concurrence with these initial findings. The City received a letter from the SHPO dated December 6, 2001, formally stating concurrence with the findings of the report (see Exhibit in this chapter).

Endangered Species Act Compliance

Biologists with CH2M HILL have inventoried existing conditions and the potential presence of any threatened and endangered species in the project area. Initial contact has been made with the National Marine Fisheries Service, the U.S. Department of Fish and Wildlife, Washington State Department of Fish and Wildlife, and the Washington State Department of Natural Resources. When a single preferred alternative for the project is selected by the City of Shoreline and FHWA, a formal ESA-compliant document (either a Biological Assessment or a Biological Evaluation) will be prepared to determine any impacts to threatened or endangered species and their habitat. The document will also determine that there will be no impact to Essential Fish Habitat. This document will be used for consultation with the regulatory agencies; its final conclusions will be documented in the Final EIS.

City of Seattle Coordination

The Cities of Seattle and Shoreline are divided by North 145th Street. In order to transition the existing configuration of SR 99 in the City of Seattle to the Aurora Corridor Project in City of Shoreline, limited amounts of work must be performed on City of Seattle property. As such, the City of Seattle is a coordinating agency on this project and must approve any work that the City of Shoreline proposes within Seattle's jurisdiction. The City of Seattle is currently reviewing preliminary construction plans of the North 145th Street/Aurora Avenue North intersection and will send its approval by letter. When the City of Shoreline obtains this letter of concurrence, formal coordination will have been established. This letter will be printed in the Final EIS.

Community Involvement

Since September 1998, the City of Shoreline has received and recorded more than 1,300 public comments relating to potential improvements in the Aurora corridor. Comments were submitted via a number of means made available by the City for its citizens.

Property/Business Owner Block Meetings (October 25, 2000 [North 145th Street to North 155th Street] and October 26, 2000 [North 155th Street to North 165th Street])

The City and its consultant conducted workshop block meetings with groups of property owners and tenants who are currently located along Aurora Avenue North. The meetings served as informational sessions in which the potential effects of this project were presented to the property and business owners individually. The meetings were also used to identify property interface and access issues and needs as well as potential right-of-way and right-of-entry requirements for construction. The goal was to develop workable solutions endorsed by both the City and the property owners.

A flier was mailed to each business and property owner at the last known address. In addition, every business along the project between North 145th Street and North 165th Street that was open during regular business hours received a flier delivered by hand. This flier was, whenever possible, given to the senior staff person at each business site. If a business was closed, a flier was left on the premises (e.g., under the door or in the mail slot). In addition, the City produced Korean language translations of fliers to assist the Korean business community members in their understanding of the project and of the meetings.

The City further procured the services of a Korean language translator to be at the "Block" meetings for the North 145th Street to North 165th Street project, which is the area where most of the Korean businesses are located. It is important to note that during these "Block" meetings, citizens who were not within the street limits designated for a particular meeting also attended. They were provided with all the materials available and offered the opportunity to meet with a consulting engineer and City staff.

During these "Block" meetings, the City took down contact information for individuals who wished to further pursue design issues on an individual basis. Furthermore, a good faith attempt was made to contact and schedule individualized meetings for business and property owners within the North 145th Street to North 165th Street project limits who had not attended the "Block" meetings. These meetings are referred to as the "Individual Property/Business Owner Meetings (December 2000–February 2001 North 145th Street–to-North 165th Street).

Individual Property/Business Owner Meetings (December 2000 – February 2001 [North 145th Street to North 165th Street])

The City and its consultant conducted individual meetings with property owners and tenants within the Aurora Avenue North/North 145th Street-to-North 165th Street Project limits. This effort was an in addition to the block meetings described above. These meetings were used to present progress on the project and to answer questions or address concerns that might have arisen since the block meetings. The individual meetings served as personal information sessions in which property owners and tenants could discuss their comments and concerns in depth.

These individualized meetings were scheduled by the project consultant by telephone. An attempt was made to contact every business and property owner between North 145th Street and North 165th Street at least once. If there was no answer and/or no answering machine or voicemail, repeated attempts were made until it became evident that no contact could be made. In cases where a telephone number could not be found, letters were sent to the last known address of the property or business owner. Pacific Northwest Title, the title company employed by the City to procure land titles, researched property owners that were undetermined and/or inaccessible.

Between October 2000 and February 2001, the City was able to make direct contact with 42 of 45 property owners between North 145th Street and North 165th Street for "Block" meetings and individualized meetings. Those not contacted were inaccessible, having either moved and left no forwarding address, or did not return telephone calls and letters. During this same period of time, the City met with 37 of 42 property owners with whom they were able to reach through direct communication. Five of those 42 elected not to meet, typically because they did not think the project would substantially affect their property. There are approximately 90 businesses located along the project from North 145th Street-to-North 165th Street. All of these businesses were contacted using fliers and direct telephone calls. The City was able to meet with 26 business owners representing 28 businesses who were willing to meet.

The City has been willing to meet, and/or discuss the North 145th Street and North 165th Street project with any property owner or business owner whenever such a meeting is requested. City contacts for the project were listed on project publications and fliers. As this

project design proceeds towards 100 percent completion, the City will continue to try to meet with property owners and business owners within the project limits to share information, and to enable development of the reconstructed interface between the street and the adjacent properties.

Pre-Design Process

The proposed improvements for the Aurora Avenue North Redevelopment Project are based on the modified preferred alternative of the Aurora Corridor Pre-Design study, which included input from the Citizen's Advisory Task Force (CATF), the Interagency Technical Advisory Committee (ITAC), the general public, and the results of the comparative evaluation of the alternatives.

The first step in the development of alternatives was to work with the CATF and ITAC to identify design issues to be addressed. In an interactive process, the CATF members were encouraged to offer their thoughts on design issues and to respond to those offered by others. Each of the issues was recorded graphically, with each member suggesting how the issues fit together. This exercise provided guidance for the consultant team to prepare design option memoranda that supported the groups' decision-making process.

Development of the design alternatives was an exercise in which the CATF and ITAC began by agreeing on the elements that could be assumed for any alternative. These included illumination improvements, undergrounding of overhead utilities, and transit signal priority, among others. Assumptions for the designs were made either because the design element was consistent with an existing policy of the City, had been clearly identified as a public priority, or was part of an already planned and funded project. Building on these assumptions, four alternatives were developed: one no action alternative and three alternatives that included some measure of improvement over existing conditions. The design alternatives represented a range of concepts from a regional, high-capacity focus, to a local focus with limited expansion in capacity.

Open Houses and Meetings

Public involvement relating to proposed improvements to the Aurora corridor began soon after the City of Shoreline was incorporated, in August 1995. Public involvement has occurred in the development of the Aurora Sub-Area Plan, the *City of Shoreline Comprehensive Plan*, the *Aurora Corridor Multimodal Pre-Design Study*, and, recently, throughout the Preliminary Engineering Phase.

Aurora Corridor Subarea and City Comprehensive Plan Process

During development of the Comprehensive Plan, a Corridor Subarea Plan was created with the public to establish guidelines for land use and transportation along Aurora Avenue North. The Corridor Subarea Plan effort was directed by a 20-plus member citizen/business advisory task force. Within this planning process for development of both the Corridor Subarea Plan and the Comprehensive Plan, more than 300 public meetings were held to obtain input from the citizens of the City of Shoreline and to form a consensus for the future policies and guidelines for Aurora Avenue North and the City of Shoreline.

Aurora Corridor Multimodal Pre-Design Study

Following the Corridor Subarea Plan and the Comprehensive Plan processes, the *Aurora Corridor Multimodal Pre-Design Study* was conducted over a 10-month period. This effort was directed by a 13-member CATF that included representatives from the businesses along Aurora North and citizens of the City of Shoreline. The following public outreach activities were conducted during the Pre-Design Study:

- 3 Citywide open houses
- 3 Planning Commission Meetings
- 8 City Council meetings
- 13 CATF meetings
- 6 Interagency Technical Committee meetings
- More than 30 meetings with other groups in the community
- More than 20 articles and advertisements in the local media, including several articles in local Korean/Asian periodicals
- 3 Citywide mailings/newsletters

Each of the meetings listed above allowed for public comment. The meetings held by the Planning Commission, the City Council, and the CATF included formal public hearings.

Preliminary Engineering Phase

The City has continued the strong public involvement component into the preliminary engineering of the Aurora Avenue North project. Public involvement has been carefully planned to ensure that property and business owners along Aurora Avenue North and the general public have an opportunity to view and comment on the project as it progresses through design. The community involvement plan for the Preliminary Engineering Phase has been facilitated through open houses, small group meetings with property and business owners, City Council meetings, and Citywide mailings. Written public comments have been collected and catalogued from each of the public meetings. Brief descriptions of these activities are presented below.

Open House No. 1 (May 11, 2000)

The City held an open house on May 11 to initiate the Preliminary Engineering Phase and to present and receive input on potential environmental topics for investigation in the environmental review for the project. Two formal presentations were made about the project and about plans for conducting an environmental review. Public comments and questions were heard, and verbal responses to questions were provided. A scheduled showing was made for all Open House participants of the FHWA Videotape entitled "Access Management-Overview" because of the nature of this corridor and concerns with improving traffic safety, while at the same time addressing business concerns about changing site access.

Open House No. 2 (September 14, 2000)

The City held an open house on September 14 to present the *Right-of-Way Policies and Procedures Manual for Aurora Avenue*. This document clarifies the City's policies on right-of-way acquisition for the Aurora Avenue North project and informs the property owners and tenants of their rights and entitlements for this process. The City took advantage of this meeting to collect input from citizens as well as to inform the public of the proposed

improvements. City and project representatives covered project alignment, construction staging, and the relationship of the Aurora Avenue North project to the Interurban Trail project.

Open House No. 3 (November 30, 2000)

The City held an open house on November 30 to present the conceptual layout for Aurora Avenue North. The City also presented samples of the types of improvements that could be constructed. The City collected comments and concerns from City of Shoreline citizens and informed the public of the proposed improvements. Citizen input was used to further refine the conceptual alternative.

Open House No. 4 (June 14, 2001)

The City held an open house on June 14 to present the results of the preliminary Engineering Phase, including results of draft environmental analyses. Displays were provided that showed the alignment of the roadway, including the location of the road edge and right-of-way needs. The City also provided a summary of draft environmental review findings; right-of-way acquisition policies and procedures; a summary of the proposed approach for stormwater management; a full-size mock-up of the sidewalk/amenity zone; and urban design/landscape concepts. Citizen input was obtained both orally (using a court recorder to record conversations) and through written questionnaires.

Property/Business Owner Block Meetings (October 25, 2000 [North 145th Street to North 155th Street] and October 26, 2000 [North 155th Street to North 165th Street])

The City and its consultant conducted workshop block meetings with groups of property owners and tenants who are currently located along Aurora Avenue North . The meetings served as information sessions in which the potential impacts of this project were presented to the property and business owners. The meetings were also used to identify property interface and access issues and needs as well as potential right-of-way and right-of-entry requirements for construction. The goal was to develop workable solutions endorsed by both the City and the property owners.

Individual Property/Business Owner Meetings (December 2000 – February 2001)

The City and its consultant conducted individual meetings with property owners and tenants as an extension to the block meetings described previously. These meetings were used to present the project's progress and to answer questions or address concerns that might have arisen since the block meetings. The individual meetings served as personal information sessions in which property owners and tenants could discuss their comments and concerns in depth.

City Council Meetings

The City and its consultant presented (at several City Council meetings) the status of the Aurora Avenue North project and specific components and aspects of the project, such as the *Right-of-Way Acquisition Policies & Procedures Manual*, the Landscaping and Urban Design Concept, and the Channelization Plan. Presentations were given at the following City Council meetings: April 17, June 12, and November 20, 2000, and January 22, April 2, and April 9, 2001. Public input was heard at each of these meetings.

Other Meetings

Several public meetings were conducted with targeted groups of the Shoreline Community including the Planning Commission meeting on November 2, 2000, and meetings with special interest groups such as the "Concerned Citizens for Shoreline" and the "Aurora Improvement Council."

Summary of May 23, 2002, Aurora Avenue Forum with Representative Ruth Kagi and Secretary of Transportation Doug McDonald

On May 23, 2002, a meeting was held at the Shoreline Senior Center. The purpose of providing an opportunity for opponents and proponents of the Aurora Corridor Project to present their comments and concerns and questions about the project and to hear responses from WSDOT and City of Shoreline staff. Representatives of project opponents included members of the Shoreline Merchants Association (SMA) and Concerned Citizens of Shoreline (CCFS). Representatives of project opponents included members of Citizens for a Safer Aurora (CSA). The meeting was facilitated by State Representative Ruth Kagi and State Transportation Secretary Doug McDonald. Approximately 75 people attended, including most of the members of the Shoreline City Council. Concerns and questions from project opponents included: the need for a raised median; reduction of the speed limit; narrowing of the sidewalks; accuracy of WSDOT safety data; lack of input from or meetings with property and business owners; desire to consider a different alternative; and concern about the cost per mile of the alternatives. Concerns and questions from project proponents included: national research literature supporting the need for median safety treatments; need for safety improvements based on personal experience with accidents; desire to improve the aesthetics; and the need for sidewalk improvements. WSDOT agreed to follow up with members of the SMA/CCFS to continue review of their design ideas and to answer questions about traffic safety data.

Summary of June 26, 2002, Aurora Avenue Design Alternatives Meeting

On June 26, 2002, a meeting was held at WSDOT Northwest Region Headquarters to provide an opportunity for the members of the Shoreline Merchants Association (SMA) and Concerned Citizens of Shoreline (CCFS) to present their design ideas regarding Aurora Avenue North. It was a follow-up meeting to the Secretary Doug McDonald and Representative Ruth Kagi meeting that was held May 23, 2002. The meeting was attended by 13 SMA/CCFS members, 8 WSDOT staff, and 3 City of Shoreline staff. The SMA/CCFS members presented design ideas on many aspects of alternatives being considered, with particular concerns to not have a raised center median, to reduce the speed limit, and to narrow the sidewalks. The SMA/CCFS members questioned the accident data and the traffic counts/projections. The WSDOT staff agreed to write up meeting notes and to respond to the questions and proposals.

Newsletters and Fact Sheets

The purpose of the fact sheets was to provide specific information about the different aspects of the project and to answer frequently asked questions about the impacts the improvements might have. The fact sheets provided information on the following subjects:

- Access Safety Improvements
- Comparing SR 99: City of Shoreline vs. Snohomish County
- Cultural Resources

- Median Width
- Pedestrian Safety and Access Benefits
- Project Benefits
- Project Funding
- Right-of-Way Acquisition
- Street Trees and Landscaping
- Traffic Improvements
- Transit Priority
- Traffic Signal Progression

Four project newsletters were produced and mailed to all citizens of the community; they are also available at the City's offices. The newsletters provide detailed information about the project and its progress. In addition, the City has a column in the Shoreline Enterprise Community Newspaper that is dedicated to the Aurora Avenue North project. This column provides updated information and project facts on a bi-weekly basis and describes how the project team was responding to various public input.

Right-of-Way Acquisition Policies and Procedures Manual

A comprehensive set of Real Property Acquisition and Relocation Policy, Procedures and Guidelines was prepared for the project in conformance with the Uniform Relocation Assistance and Real Property Acquisitions Act of 1970, as amended. Both tenants and owners are protected by this act. This document provides a detailed summary of the process of right-of-way acquisition and outlines general process information. The document also includes state and federal regulations related to acquisition, relocation, and condemnation. Preparation of this document included public review and input and it was adopted by the Shoreline City Council to serve as a community and agency resource in the right-of-way acquisition process for the Aurora corridor.

Exhibit

STATE OF WASHINGTON
OFFICE OF COMMUNITY DEVELOPMENT
Office of Archaeology and Historic Preservation
1063 S. Capitol Way, Suite 106 - Olympia, Washington 98501
(Mailing Address) PO Box 48343 • Olympia, Washington 98504-8343
(360) 586-3065 Fax Number (360) 586-3067

December 6, 2001

Mr. Brian Hasselbach
Washington State Department of Transportation
P.O. Box 47300
Olympia, Washington 98504-7300

In future correspondence please refer to:
Log: 120601-21-FHWA
Re: City of Shoreline, Aurora Avenue North from N. 145th to N. 165th Street, STPUL-0099 (062)

Dear Mr. Hasselbach:

Thank you for contacting the Washington State Office of Archaeology and Historic Preservation (OAHP) regarding the above referenced action. This consultation is in adherence to the National Historic Preservation Act of 1966 (as amended) and implementing regulations 36 CFR Part 800.4. From your letter, I understand that the City of Shoreline proposes widen and alter Aurora Avenue North from N. 145th Street to N. 165th Street. Changes include access/transit lanes, curb, gutters, sidewalks, stormwater facilities, and medians.

In response and on behalf of the Washington State Historic Preservation Officer (SHPO) I concur with the recommendations and conclusions found in the Historic and Archaeological Discipline Report (October 2001) prepared by CH2M Hill for this project. In previous correspondence, OAHP concurred that the Pershing Interurban Bulkhead is not eligible for listing in the National Register of Historic Places. Although of interest in view of its association with the historically significant interurban transit system, the bulkhead represents only a fragment of the system and therefore unable to individually convey the character and operations of the system in its entirety. As a result of this concurrence, further contact with OAHP on this project is not necessary. However, I am of the understanding that potentially significant historic properties remain elsewhere along the Aurora Avenue corridor in Shoreline. As future projects take place elsewhere on the corridor, I recommend that historic properties be inventoried and plans made to avoid any adverse effects to properties deemed historically significant. Additionally, should the subject project scope of work change significantly or should any ground disturbing work reveal archaeological resources, please resume consultation with our office and interested tribal authorities.

Again, thank you for the opportunity to review and comment on this proposal. Should there by any questions, I may be reached at 360-586-3073 or gregg@cted.wa.gov.

Sincerely,

Gregory Griffith
Deputy State Historic Preservation Officer

CHAPTER 5

Bibliography and References

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APPENDIX A

Description of Scoping Process

To afford full consideration of any potential substantial adverse impacts, it was determined in agreement with the Federal Highway Administration (FHWA) and the Washington State Department of Transportation (WSDOT) that a State Environmental Policy Act (SEPA) Environmental Impact Statement (EIS) would be prepared in a joint document that would also serve as a National Environmental Policy Act (NEPA) Environmental Assessment (EA).

Although no formal scoping process is required for a NEPA EA, a 3-week scoping period is required for a SEPA EIS. The City of Shoreline issued a Scoping Notice on August 2, 2001, that identified the proposed alternatives to be studied in the EIS as well as environmentally important issues. Respondents were invited to suggest new alternatives, mitigation measures, probable significant adverse impacts, and permits or other approvals that may be required. To ensure that all comments were included in the review of the project, comments were requested in writing and addressed to the City's Responsible SEPA Official.

Scoping comments were accepted during the next 21 days; the comment period closed August 24, 2001. The City set the discussion of environmental elements to include elements of the natural environment (e.g., air quality, surface water movement/quantity/ quality, runoff/absorption, critical/sensitive areas, nonrenewable resources, and conservation of renewable resources) and elements of the built environment (e.g., land use, land use plans, population growth, housing, light and glare, aesthetics, historic and cultural resources preservation, transportation and transportation systems, vehicular traffic, parking, movement and circulation of people or goods, traffic hazards, and maintenance). Additional impacts, beyond those described above, may also be addressed in the EIS.

The scoping process resulted in suggestions for additional alternatives and requests for the entire 3-mile corridor to be studied as one project. Individual scoping letters may be viewed at the City. None of the proposed alternatives were found to meet the project purpose and needs and, therefore, these alternatives have not been considered for further documentation in this EIS (see Chapter 2 – Alternatives Examined but Rejected). The rationale for establishing the project termini at North 145th Street and North 165th Street is also explained in Chapter 2.

For a description of public involvement and scoping processes during the pre-design phase of this project, see Chapter 4 of this document.

APPENDIX B

Relationship to Plans and Projects

Plans

The Aurora Corridor Project has developed from the goals established in the City's subarea study and Comprehensive Plan. These documents have laid the groundwork for specific actions, such as this project, to improve conditions along the corridor.

Aurora Corridor Subarea Plan

An *Aurora Corridor Subarea Plan* was prepared to explore land use alternatives for Shoreline's Comprehensive Plan. The study emphasized evaluation of economic feasibility for each alternative, as well as implementing guidelines to make certain that improvements are made. It also specified land use designations for community business, regional business, and mixed uses along the corridor.

Preliminary Concepts

In order to alleviate some of the problems on Aurora Avenue North, a set of eleven redevelopment projects were composed to improve the City of Shoreline as a whole. These projects took into consideration improvements to transportation, land use, residential and community spaces, and urban design components. The projects also considered special opportunity sites or prime locations within the City in which development could occur. The various project alternatives were then evaluated with respect to pedestrians, transit and traffic, and safety measures, among other issues. From the previous eleven project alternatives, three were selected as possible future scenarios. These include No Action, Special Projects, and Downtown.

The No Action Alternative would result in basically the same traffic accommodations and operations that are present today, with a few enhancements. Curbs, gutters, and sidewalks would be constructed over time. Express bus service would increase, with a possibility of adding HOV lanes along Aurora Avenue North.

The Special Projects alternative focused on "turn-around" projects along Aurora Avenue North that were designed to revitalize the community and generate long-term returns. These projects were set at prime locations to hopefully attract new investments over time, therefore increasing growth in the corridor. With this increased growth comes increased vehicle and pedestrian traffic. Suggestions for managing additional traffic would be to have areas designated as "pedestrian-based" or "automobile-served" with specific accommodations and standards. For example, the "pedestrian-based" areas would include construction of curb, gutter, and sidewalk along Aurora Avenue North with planted medians and pedestrian connections to new developments. For "automobile-served" areas, construction of curb, gutter, and sidewalk would occur over time through redevelopment. Improvements would be focused on motorized travel with potential HOV lanes along Aurora Avenue North and transit facilities such as additional bus pullouts and bus shelters.

The Downtown Alternative focused on one area, a "downtown" area, that would serve as a pedestrian oriented anchor to the community with many different uses. New developments would be in one section of the Aurora corridor, concentrating on the areas between North 170th Street and North 185th Street. Park blocks within the downtown area would be created to serve as a public space along Aurora Avenue North, which will be refurbished with curb, gutter, and sidewalks. Also, new signalized intersections along Aurora would aide in creating smaller blocks and more east-west connections across Aurora, which together with marked paving at crosswalks, make this corridor much more pedestrian oriented. New developments would also need to be pedestrian oriented.

These three concepts were presented in the *Aurora Corridor Subarea Plan Technical Report* (Shoreline, 1997). The information in the technical report fed into the Comprehensive Plan and its subsequent EIS process. Refinement of the Aurora corridor vision, and the need for an Aurora corridor project, occurred in the Comprehensive Plan.

City of Shoreline Comprehensive Plan

The City adopted its Comprehensive Plan on November 23, 1998. The plan gives guidance on the future of the Aurora corridor in terms of its land use, transportation, and economic vision. To achieve land use goals, the "commercial strip" type of retail areas will be converted to "themed" centers that are more pedestrian friendly and provide access to transit. The transportation unit as a whole in Shoreline is currently not up to standard in many areas. A major concern of citizens is the increase in through-traffic in residential areas, safety, congestion relief, improved transit service, and general appearance of Aurora Avenue North. Economic development ideas that could enhance the climate in the City include providing a more complete range of services, professional jobs, and recreation so that citizens will not have to travel elsewhere; encouraging current businesses to upgrade in service and appearance; enhancing commercial areas by design guidelines; and directing public works to improve certain areas. These changes could result in important improvements such as strengthening the economy along Aurora Avenue North, creating a City identity, and increasing the attractiveness to the investment community.

In terms of land use, the project will directly address the following two goals relating to the City's commercial areas and specifically to the Aurora corridor.

Goal LU VII: To increase the vitality and economic development in the North City and Aurora business areas through a public/private effort.

- *Goal LU VIII: To redirect the changes in the Aurora Corridor from a commercial strip to distinct centers with variety, activity, and interest by:*
  - *balancing vehicular, transit, and pedestrian needs*
  - *creating a "sense of place" and improving image*
  - *protecting neighborhoods*
  - *encouraging businesses to thrive*
  - *using a strategy based on sound market principles*

The Comprehensive Plan also identified improvements to Aurora Avenue North as a base assumption for the City during the planning horizon.

"Upgrading Aurora Avenue North to meet urban standards. This project would include the review and installation of curbs, gutters and sidewalks to support pedestrian traffic. In conjunction with WSDOT and Metropolitan King County drainage and traffic flow improvements will be implemented. Also included in the potential mitigation projects on Aurora Avenue North are right turn lanes at several signalized intersections. In some places, these added right turn lanes would be extended through the intersection to provide bus bays and space for vehicles to make U-turns."

The plan further describes the desired characteristics for a reconstructed Aurora Avenue North within the City.

"The transportation solution for Aurora should strike a balance between:

being a downtown or urban street with defined edges, and slower moving traffic, and accommodating a through traffic function that is more typical of a state highway."

A policy point is provided to support reconstruction of Aurora Avenue North in a way consistent with the desired characteristics identified in the Plan.

T17: Pursue methods to improve and enhance transit operations on Aurora in Shoreline. Ensure that Aurora continues to function as a primary transit corridor and provide frequent headways and express service to downtown Seattle (15 minute headways during commute hours). Explore potential low fare shuttle service on Aurora within Shoreline.

At an open council meeting on August 23, 1999, the proposed concept for Aurora Avenue North was found to be consistent with the *City of Shoreline Comprehensive Plan*. The Shoreline City Council adopted Resolution 156, which provided a 32-point directive for improvements to Aurora Avenue North designed to meet the needs identified for the corridor. Some of these points conflict with FHWA procedures and design standards; FHWA and the City of Shoreline are committed to resolving all conflicts between the directive and the project elements prior to construction. The 32 points are listed below.

1) *The maximum number of lanes on an intersection leg shall not exceed eight lanes including turning lanes. Seven lanes is the desired width.*
2) *Provide ability at intersections for all pedestrians to safely cross (and include median refuge at intersections with pedestrian pushbuttons). New mid-block pedestrian crossings should include pedestrian activated signals. Bus stops and pedestrian crossings will complement each other.*
3) *Twelve foot sidewalks will be provided on both sides of Aurora the entire length. Consider reducing the initial sidewalk width to mitigate land impacts/acquisitions on existing businesses. Note: a minimum of four feet of a landscaping/street furnishing zone is included in the twelve foot width total above.*
4) *Utilize more landscaping or colored pavement in sidewalk areas to soften the look. The four foot landscaping/street furnishing strip behind the curb should utilize trees in tree grates/pits (consider a combination tree protector/bike rack), low growing ground cover/shrubs, and could utilize some special paving (or brick) between curb and sidewalk to strengthen the identity of an area.*
5) *Strive to design the project so that new sidewalks can link to existing recently constructed sidewalks (such as Seattle Restaurant Supply, Drift-on-Inn, Schucks, Hollywood Video, and Easley Cadillac).*

6) *Re-align the street where possible to avoid property takes.*

7) *As the final design is developed, work with WSDOT to obtain design approvals for lane width reductions, and look for opportunities to reduce (but not eliminate) the median width both to enable reduction of pavement widths, construction costs, and land impacts/acquisition on existing businesses.*

8) *Develop median breaks or intersections for business access and U-turns at least every 800-to-1000 feet (these details will be worked out during future design phases and will be based in part on the amount of traffic entering and exiting businesses).*

9) *Use low growing drought resistant ground-cover and space trees in the median to allow visibility across it.*

10) *Unify the corridor by adding art, special light fixtures, pavement patterns (and coloring at crosswalks), street furniture, banners, unique bus shelters, etc. to dramatically enhance image and uniqueness of the streetscape and develop it differently than the standard design that has been constructed for most streets.*

11) *Unify the entire corridor by the use of street trees, lighting, special paving, bus zone design, and other elements to visually connect the corridor along its length.*

12) *Provide elements in the Interurban/Aurora Junction area, between 175th and 185th that create a safe, pedestrian oriented streetscape. Elements can include special treatments of crossings, linkages to the Interurban Trail, etc.*

13) *Develop signature gateway designs at 145th and 205th with special interest landscaping, lighting, paving and public art to provide a visual cue to drivers that they have entered a special place.*

14) *Develop themes that reflect the character and uses of different sections of the street (such as the 150th to 160th area which has a concentration of international businesses, recall the historic significance of the Interurban or other historic elements, and Echo Lake).*

15) *Utilize the Arts Council and neighborhoods to solicit and select art along the corridor.*

16) *Strengthen connections to the Interurban Trail through signing and other urban design techniques.*

17) *Develop a design for closure of Westminster Road between 158th and 155th by developing a southbound right turn lane at 155th Street and converting the existing road section to a driveway entrance to Aurora Square. Also, develop an elevated Interurban trail crossing through "the Triangle" that is integrated with future development of the Triangle (reserve the option to build above Westminster should we not be successful in closing the roadway).*

18) *Pursue modifying the access to Firlands at 185th, closing Firlands north of 195th, and developing a new signal at 195th.*

19) *The preferred design shall include:*

- *Stormwater management improvements to accompany the project that follow the city's policies;*
- *Traffic signal control and coordination technology (including coordination with Seattle and Edmonds SR 99 signal systems);*
- *Traffic signal technology to enable transit priority operations;*
- *Continuous illumination for traffic safety and pedestrian scale lighting;*
- *Undergrounding of overhead utility distribution lines.*

20) *Traffic signals will include audible elements for the sight-impaired, and wheelchair detection loops for wheelchair users.*

21) *The City should establish a right-of-way policy to retain or relocate existing businesses along the corridor, including those that do not own the land on which they are located. Consideration should be given to providing financial incentives to those businesses.*

22) *Work with property and business owners during the preliminary engineering phase to consolidate driveways, share driveways, and potentially to share parking and inter business access across parcel lines. Be creative and sensitive to the parking needs of businesses, including consideration for some potential clustered/shared parking lots (especially if remnant parcels are available).*

23) *Provide improvements that will not generate an increase in neighborhood spillover traffic.*

24) *Work with transit agencies to provide increased service and seek capital investments from them to support this project.*

25) *Develop partnerships with WSDOT and King County/Metro to jointly fund the project.*

26) *Provide curb bulbs where practical on side streets to reduce pedestrian crossing width and to discourage cut-through traffic.*

27) *Strengthen and preserve the heritage of the red brick road. If the design impacts the red brick road in its current configuration/location north of 175th, preserve its heritage by relocating it elsewhere.*

28) *Consider new signalized intersections at 152nd, 165th, 182nd, and 195th.*

29) *Consider new pedestrian only signalized crossings in the vicinity of 149th, 170th, 180th and 202nd.*

30) *Sign Ronald Place south of 175th as the route to I-5.*

31) *Pursue reducing the speed limit to 35 mph where appropriate recognizing the potential impacts of spillover traffic with a lower posted speed.*

32) *Seek funding to develop a program to assist and encourage businesses to improve their facades.*

City of Shoreline Pedestrian Safety Study

The purpose of the Shoreline Pedestrian Safety study was to identify pedestrian safety concerns and suggest appropriate actions to address these concerns within the two main north/south arterial corridors in the City of Shoreline (15th Avenue NE and Aurora Avenue North). Limited crosswalks, limited lighting, high speeds and traffic volumes, and numerous allowable turn movements make the possibility of crashes between vehicles and pedestrians very high. The results of this study were a proposed set of interim safety improvements for Aurora Avenue North for consideration in the final roadway design.

Design Recommendations of the Pedestrian Safety Study

Recommendations from the study were broken down into recommendations for the entire corridor and recommendations for specific locations.

Entire Corridor Improvements

There were short-term and long-term improvements recommended for the entire corridor. Short-term recommendations included reducing the speed limit from 45 mph to 40 mph;

installing street lights and more visually impressive mid-block crosswalks to bring attention to pedestrians; and applying solid lane lines on approaches to unsignalized crosswalks to prevent vehicles from switching lanes into a crossing area. Long-term recommendations included reducing the number of driveways for each property; signalizing current stop-controlled intersections; and creating medians in the center lane.

Mid-block Improvements

A major recommendation for mid-block improvement was the addition of marked crosswalks. The locations of these crossings were chosen with consideration to current pedestrian volume, location and demand for nearby bus stops, distance between other crosswalks, and ability to prevent or control left turns. The proposed locations all use the medians in the center lane, which helps pedestrians by allowing them to focus on one direction of traffic at a time.

Projects

The following projects relate to the Aurora Corridor Project in terms of their proximity to the project and their effects on the movement of people and vehicles. The impacts of these projects, combined with those of the Aurora Corridor Project, are analyzed in the cumulative impacts section of the environmental analysis. No substantial cumulative impacts have been identified. There would also be no substantial cumulative impacts in the event that no improvements are made to Aurora Avenue North from North 165th Street to North 205th Street.

Interurban Trail

The Interurban Trail project will enhance the regional transportation system by providing a new non-motorized link through the City of Shoreline. The Interurban Trail will be built along the old Interurban Railroad right-of-way which is now owned by Seattle City Light and used as a transmission line right-of-way. Trail improvements include a paved shared-use path, pedestrian bridge as well as soft-surface paths with connections to the City's parks, recreation and commercial areas.

The Interurban Trail project is divided into four phases—South Phase: North 145th Street to North 155th Street; South Central Phase: North 155th Street to North 175th Street; North Central Phase: North 175th Street to North 188th Street and North Phase: North 188th Street to 205th Street. A pedestrian bridge is proposed across 155th Street and Aurora Avenue North in the vicinity of 155th Street. However, at this time, there is no funding available for a bridge, so an interim solution of connector paths down to Aurora Avenue North will be implemented initially.

The Aurora Avenue North project team has been coordinating with the members of the Interurban Trail design team as well as with City staff to ensure that the design for both of these projects is compatible and consistent with the planned improvements. Improvements due to the Interurban Trail in conjunction with the improvements of the Aurora Avenue North project will encourage pedestrian traffic and enhance pedestrian safety through the city of Shoreline.

Aurora Avenue North Multimodal Corridor Project: North 165th Street to North 205th Street

Improvements to Aurora Avenue North from North 165th Street to North 205th Street are contingent upon project funding. The design of the project may be based on the Citizen Advisory Task Force committee's recommended Alternative 2 from the Pre-Design Study that covered the full length of the Aurora corridor. Additional environmental review and public involvement will be carried out, and design refinements and modifications may be made to suit the conditions in that portion of the corridor and to help minimize and avoid environmental impacts. The location and design of the Interurban Trail from North 175th Street to North 188th Street also will be evaluated and potentially constructed as a part of the improvements to Aurora Avenue North from North 165th Street to North 205th Street.

Pedestrian Safety Demonstration Project

Two Pedestrian Safety Demonstration projects are proposed along Aurora Avenue at North 165th Street and North 170th Street. These projects are being developed jointly with the Washington state Department of Transportation and the Washington Traffic Safety Commission in partnership with the city of Shoreline. Improvements at these locations will include pedestrian refuge areas, pedestrian activated flashing advance warning signals and "roving eyes" signals, sidewalk improvements and lighting. The project also involves increased education and community outreach to improve awareness of pedestrian safety laws and compliance by motorists and pedestrians.