EDMONDS CROSSING

Connecting ferries, bus & rail

Chapter 4 Environmental Consequences

4.1 Introduction

This chapter describes both the impacts that would result from the proposed project alternatives and the proposed measures to avoid or minimize those impacts. The discussion of impacts is organized by elements of the environment. For each element, the impacts common to both build alternatives, if any, are discussed first; then any additional impacts applicable to the separate alternatives are described. Impacts of both full buildout (Phase 1 and Phase 2) and the initial Phase 1 only for each build alternative are presented (see Section 2.7, Project Phasing, in Chapter 2). Assumptions, analytical methods, and sources of information used in each element impact analysis are also provided under the heading "Studies and Coordination." Impacts are divided into the following categories:

- Long-term operation of the project (Sections 4.2 through 4.17)
- Short-term construction activities (Section 4.20)
- Cumulative impacts (Section 4.21)
- Indirect impacts (Section 4.22)

This impact analysis examines the No Action Alternative (Alternative 1) and the Mid-Waterfront Alternative (Alternative 3) that were included in the Draft EIS. This analysis also examines Modified Alternative 2 (identified as the Preferred Alternative). Modified Alternative 2 is derived from Alternative 2 that was examined in the Draft EIS. As noted in Chapter 2, Alternative 2 was dropped from further consideration as a result of tribal concerns related to impacts to protected treaty fishing rights and the likely non-support of resource and regulatory agencies.

4.2 Air Quality

4.2.1 Studies and Coordination

The following discussion is based on the air quality discipline report (CH2M HILL, 2003) and the air quality monitoring data appendix (CH2M HILL, 1996), which is incorporated into this EIS by reference.

Impacts that would occur to air quality during construction of the proposed project are discussed qualitatively because specific construction details (activities, areas, sequencing) have not been developed yet. This analysis is included in Section 4.20, Construction Activity Impacts, later in this chapter. Particulate matter (PM) is the primary pollutant of concern arising from earth-moving activities.

Operational impacts from changes to traffic patterns and volumes were estimated according to the guidelines provided in EPA *Guideline for Modeling Carbon*

Monoxide from Roadway Intersections (U.S. EPA, 1992a) and the *Guidebook for Conformity: Air Quality Assistance for Nonattainment Areas* (KJS Associates Inc., Sierra Research, Inc., and Environanalysis, September 1995). CO is the major pollutant of concern in vehicle exhaust. The impact analysis involves estimating the CO emissions generated by vehicles in the project area and using a dispersion model to estimate the ambient concentration at receptors placed around the intersections analyzed. The intersections deemed to be affected by the relocation of the ferry pier were the Dayton Street/ SR 104 intersection and the Pine Street/SR 104 intersection. The intersection of 100th Avenue South (9th Avenue South) and SR 104 was also analyzed as a part of the conformity analysis because of its high volume during peak hours, although the project contributes a very small percentage of the total volume at this intersection. Therefore, these three intersections were analyzed quantitatively as the top three project-affected intersections. No other intersections in the project vicinity, which are impacted by the project, have higher volumes or worse levels of service.

Analysis of CO concentrations was performed in the vicinity of these intersections for both build and the No Action alternatives. Peak-hour traffic volumes were estimated using the SYNCHRO traffic model as described in Appendix B, Off-Site Traffic Analysis. Traffic volumes were used in the model runs to estimate a 1-hour maximum CO concentration. The peak-hour volumes include ferry traffic for all scenarios modeled. As required by regulations to demonstrate conformity with the State Implementation Plan (SIP), the analysis was performed for 3 years; existing 2002, year of Phase 1 opening 2008, and design year of full buildout 2030.

Emission factors in grams per vehicle mile traveled were estimated for each vehicle speed evaluated in the analysis using EPA's model MOBILE5b (U.S. EPA, 1994). MOBILE5b calculates emission factors for gasoline-fueled light-duty vehicles, trucks, heavy-duty vehicles, and motorcycles, as well as for diesel-fueled light-duty vehicles, trucks, and heavy-duty vehicles. The model accounts for progressively more stringent tailpipe emission standards over the vehicle model years evaluated, the effects of inspection and maintenance programs, and use of oxygenated or reformulated fuels.

Output data from the MOBILE5b model were obtained from the PSRC (McGourty, pers. comm. 2002 and 2003). The modeled emission factors for 2008 and 2030 were adjusted by PSRC using EPA factors to account for the Tier II Gasoline/Sulfur Rule.

Using the MOBILE5b emission factors for various travel speeds, the CAL3QHC dispersion model was used to calculate ambient concentrations of CO near the roadway intersections. Modeled receptors were located at sites accessible to the public, generally near intersection corners and near each approach and departure link, according to guidelines provided in the *Guidebook for Conformity* (KJS Associates *et al*, September 1995). The receptors were placed no closer than 3 meters from the edge of the road, at the corners and distances of 25 and 50 meters from each corner. As indicated in the EPA guidelines (U.S. EPA, 1992b), meteorological input parameters consisted of a 3-feet-per-second wind speed, 3,250-foot mixing height, and a moderately stable (Class E) atmosphere to simulate winter conditions when elevated CO concentrations most frequently occur. One-

hour average ambient CO concentrations were calculated to estimate the impact during peak-hour traffic conditions. A background CO concentration of 3 ppm was used, which accounts for other sources of CO emissions in the project area, such as home heating and train and ferry exhaust.

Because the 8-hour average CO National Ambient Air Quality Standard (NAAQS) is lower and more limiting than the 1-hour standard, the results of air quality analyses of traffic emissions are typically reported for this averaging period. Regulatory guidance indicates adjusting the 1-hour impacts to 8-hour using a factor of 0.7, which accounts for variations in meteorology over an 8-hour period. Results are reported in this document for both the 1-hour and 8-hour concentrations. A more detailed description of this analysis can be found in the air quality discipline report (CH2M HILL, 2003).

4.2.2 Impacts

Alternative 1: No Action

There would be no project-related air quality impacts under the No Action Alternative. For purposes of comparison, the CO concentrations were predicted for 2008 and 2030 under No Action conditions at the Dayton/SR 104 and 100th Avenue/SR 104 intersections. Table 4-1 shows the maximum predicted 1-hour and 8-hour concentrations. The maximum CO concentration is predicted to be below the standards at both intersections for both forecast years. The CAL3QHC model output files are included in the air quality discipline report.

Table 4-1
Maximum Modeled CO Concentrations (ppm)

Alternative	Intersection	1-Hour/8-Hour Concentrations		
		2002	2008 (Phase 1)	2030 (Full Buildout)
Alternative 1: No Action	Dayton Street/SR 104	5.1/4.5	3.7/3.5	3.5/3.4
	Pine Street/SR 104	N/A[a]	N/A[a]	N/A[a]
	100th Avenue South/ SR 104	8.1/6.6	5.6/4.8	4.6/4.1
Modified Alternative 2: Point Edwards Site	Dayton Street/SR 104	N/A	3.9/3.6	3.7/3.5
	Pine Street/SR 104	N/A	4.5/4.1	4.2/3.8
	100th Avenue South/ SR 104	N/A	5.3/4.6	4.8/4.3
Alternative 3: Mid-Waterfront Site	Dayton Street/SR 104	N/A	3.6/3.4	3.6/3.4
	Pine Street/SR 104	N/A	4.1/3.8	4.0/3.7
	100th Avenue South/ SR 104	N/A	5.3/4.6	4.7/4.2

[a] *Pine Street/SR 104 was not analyzed for 2002 existing or 2008/2030 no-action conditions, because it is not a signalized intersection under these scenarios.*

ppm parts per million

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Design Year

Operation impacts resulting from this alternative would consist mainly of changes in vehicle traffic patterns, which could affect associated vehicle emissions. These changes include shifting volumes to different intersections which may result in varying impacts, depending on the capacity of the intersection and the resultant number of idling vehicles. The air quality analysis is based on data obtained from the Off-Site Traffic Analysis contained in Appendix B.

One of the project objectives is to alleviate congestion at over-capacity intersections in the project area, and, thus, to decrease the frequency of idling vehicles. This objective would be accomplished by routing a large portion of the vehicle trips, those approaching or coming from the ferry and the multimodal center, to a realigned SR 104 and away from the downtown Edmonds area.

The model was run to calculate CO concentrations near the three intersections in the vicinity of the project. As shown in Table 4-1, the maximum 1-hour and 8-hour concentrations are predicted to be below the standards at all three intersections in 2030.

Project Opening

Table 4-1 shows CO concentrations predicted in the year 2008, which is the anticipated completion year for Phase 1. The modeled concentrations indicate slightly higher impacts for Phase 1 at all three intersections than for full buildout. This is anticipated based on the fact that fleetwide emissions are predicted to be lower in 2030 due to improved emission controls in later model year vehicles.

Alternative 3: Mid-Waterfront Site

Design Year

Impacts to air quality from this alternative would be similar to those for Modified Alternative 2, as ferry traffic is also being routed through the Pine Street/SR 104 intersection. Table 4-1 shows the maximum 1-hour and 8-hour concentrations, which are predicted to be below the standards at all three intersections in 2030.

The multimodal center, which would be located at Dayton Street and Edmonds Way (the existing SR 104), would mean more vehicles traveling through the Dayton Street intersection. However, the P.M. peak-hour volumes predicted at this intersection for Alternative 3 would be still lower than for the No Action Alternative and, likewise, so are the predicted CO concentrations.

Project Opening

As with Modified Alternative 2, Phase 1 impacts are slightly higher than full buildout at the Pine Street and 100th Avenue South intersection. Predicted CO concentrations are the same as full buildout a the Dayton intersection as the

predicted volume increase by 2030 offsets the reduction from vehicle emission controls. Concentrations are below the standard at all three intersections.

4.2.3 Conformity Determination

Projects located in nonattainment or maintenance areas for a given pollutant must comply with provisions of the 1990 Clean Air Act (CAA) Amendments. They also must comply with the promulgated state and federal rules that require a determination of conformity with the SIP. The Edmonds Crossing project is located in the Puget Sound region, a maintenance area for both CO and ozone.

The proposed project is included in the Metropolitan Transportation Plan (MTP), Destination 2030 (PSRC, May 24, 2001), and the 2003-2005 Regional Transportation Improvement Program (TIP) (PSRC, October 24, 2002, as amended through the PSRC Regional TIP Amendment 2003-01, and corrected through 1-21-03). Both of these have been found to meet the conformity tests as identified by federal and state conformity regulations. The results of the CO concentrations analysis at specific intersections show that none of the build alternatives would create a new CO violation of the NAAQS, nor would they worsen any existing violation. Therefore, the project would conform to the Washington SIP.

Currently, no EPA-approved method exists for analysis of O_3 impacts on a project level. It is a pollutant typically formed downwind of the source of its precursor compounds in the presence of sunlight and is best analyzed regionally. Photoreactive volatile organic compounds (VOCs) are a precursor to ozone formation in and around urban areas. The TIP findings indicate that VOC emissions from the projects and programs are below the established daily motor vehicle emission budget, as established in the O_3 maintenance plan. Therefore, the project would conform to the Washington SIP.

4.2.4 Mitigation Measures

The overall intent of the project is to improve access between ferry, rail, and transit facilities so that mass transportation would be more convenient to commuters and SOV travel would be reduced; the reduction in SOV travel would affect air quality positively by reducing vehicle emissions. Both build alternatives would include a HOV lane to encourage such travel and reduce SOV trips. The multimodal center project is, in itself, a mitigation measure to improve air quality in the project area. As a result, no additional mitigation is considered necessary or proposed.

4.3 Noise

4.3.1 Studies and Coordination

This discussion is based on the noise discipline report (CH2M HILL, 2003), which is incorporated into this EIS by reference. The noise analysis and impact determination is based on assessment of future noise levels under 2030 traffic conditions for vehicles and ferry operations. The 2030 conditions presumably present a “worst-case” analysis because the proposed project would be fully built

out and operational and background traffic would be at its highest levels (as noted in Appendix B, Off-Site Traffic Analysis). Interim years (such as 2015) are, therefore, not evaluated for potential noise impacts.

Traffic Noise

The traffic noise analysis has been prepared to meet the requirements of the *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (23 Code of Federal Regulations [CFR] 772, 1992) and the guidelines of FHWA Technical Advisory T6640.8 (*Guidance Material for the Preparation of Environmental Documents*, 1982).

The project traffic noise levels were evaluated against the traffic noise abatement criteria contained in 23 CFR 772. FHWA defines noise level criteria for residences, churches, schools, recreational areas, and similar sites as exceeded when the L_{eq} approaches or exceeds 67 dBA and for commercial and industrial uses as 72 dBA. FHWA considers a traffic noise impact to occur if predicted noise levels approach or exceed criteria or substantially surpass existing levels. WSDOT has defined "approach" as being within 1 dBA of the FHWA noise impact criterion. Therefore, a residential impact occurs if predicted noise levels are 66 dBA (L_{eq}) or higher, and an industrial/commercial impact occurs if noise levels are 71 dBA (L_{eq}) or higher. WSDOT has defined the substantial increase criterion to be 10 dBA above existing peak-hour noise levels.

Ferry Noise

Because the Edmonds/Kingston ferry operations are considered a continuation of SR 104, the same traffic noise impact criteria discussed above for traffic noise apply to ferry noise. Ferry horn noise is exempt from regulations because it is a warning/ safety device.

Railroad Noise

With or without the Edmonds Crossing project, rail traffic through the project area is forecast to increase from the current 35 trains per day to as many as 104 trains per day in 2030. This increased rail traffic will be the direct result of the proposed commuter rail service and additional train and freight service. The Edmonds Crossing project is intended to accommodate this growth. As a result, this environmental document does not address direct railroad noise impacts or potential mitigation measures. Those direct impacts will be addressed in the separate environmental documents to be prepared by BNSFRR on the proposed addition of another railroad track. The cumulative effect of the additional rail traffic and the noise impacts of the Edmonds Crossing project and other anticipated developments in the project area are briefly discussed in Section 4.21, Cumulative Impacts, and Section 4.22, Indirect Impacts.

Train noise would substantially contribute to the overall noise environment in the project area, particularly at receiver locations within the Edmonds Marina. Train noise would have a less substantial effect at locations farther from the railroad tracks.

Furthermore, based on Federal Transit Administration (FTA) screening procedures (FHWA criteria and guidelines do not address potential noise associated with trains), noise impacts at distances greater than 450 feet from train stations are not likely. Since the nearest residential locations in Woodway are located farther than 450 feet from the future train station, there would not be any noise impacts from such facilities.

4.3.2 Impacts

The Edmonds Crossing project noise impacts were evaluated based on forecasted traffic volumes identified in the Off-Site Traffic Analysis contained in Appendix B. Future vehicular and ferry traffic noise levels for each alternative are discussed below, as well as total project noise levels from both of these sources. Because the FHWA regulations apply only to vehicular traffic noise levels, background noise sources other than vehicular traffic and ferries were not analyzed.

Alternative 1: No Action

Traffic Noise

Peak-hour L_{eq} traffic noise level modeling shows that noise levels would increase by 1 to 2 dBA over existing conditions at some noise-sensitive receiver locations under the No Action Alternative (represented by receivers 4 through 7). These locations include the residential areas in Woodway near the SR 104/Pine Street intersection, Edmonds City Park, and the Edmonds Park Condominiums. The largest increase in noise levels would be 4 dBA at Brackett's Landing South Park and commercial locations closest to the existing ferry pier. At remaining locations farther removed from the existing roadway system, noise levels are not expected to change much relative to existing levels.

Ferry Noise

No substantial change in noise levels from ferry operations is expected under Alternative 1.

Total Project Noise Levels

Table 4-2 shows the total estimated project noise level, including vehicular traffic and ferry traffic for the No Action Alternative. Existing conditions, the Point Edwards Alternative, the Mid-Waterfront Alternative, and the FHWA noise abatement criteria are shown for comparison.

Under Alternative 1, peak-hour traffic (vehicles and ferry) noise levels at all representative receiver locations would remain well below the noise abatement criteria. At Woodway residential locations away from SR 104 and live-aboard boats in the Edmonds Marina, noise levels would not be expected to change from existing conditions. At residential and park locations along or in the vicinity of SR 104 (receivers 4 through 7), peak-hour traffic noise levels would increase by 1 to 2 dBA due to future increases in traffic volumes. At Brackett's Landing South Park (receiver 10), increased traffic using the ferry would result in up to a 4-dBA

increase in peak-hour noise levels. Under future (2030) No Action conditions, noise levels at none of the receiver locations evaluated would approach the FHWA noise abatement criteria (as shown by Table 4-2).

Table 4-2
Total Project Noise Level Comparison of Existing Conditions, All Alternatives, and Noise Abatement Criteria (dBA-Leq)

Receiver Location	FHWA Peak-Hour Impact Criterion	Existing Conditions (2002)	Alternative 1 (No Action) (2030)	Modified Alternative 2 (Point Edwards Site) (2030)	Alternative 3 (Mid-Waterfront Site) (2030)
1	66	51	51	57	52
2	66	43	43	46	46
3	66	43	43	46	46
4	66	48	49	57	56
5	66	52	54	59	57
6	66	53	55	55	54
7	66	52	53	53	52
8	66	54	54	54	56
9	66	57	57	57	60
10	66	59	63	48	48
11	66	51	51	58	52
12	66	54	54	54	57
13	66	57	57	57	65

Notes: Receiver locations are shown in Figure 3-1.

Noise levels at receiver 10 are due only to vehicular traffic utilizing the ferries. Under Modified Alternative 2 and Alternative 3, overall future background noise levels at this location could be in the low- to mid-50s dBA, which would be higher than the traffic noise level shown in the table.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Traffic Noise

Under Alternative 2, peak-hour L_{eq} traffic noise level modeling shows that, by 2030, vehicular traffic noise levels at Marina Beach Park (receiver 11), would increase by up to 7 dBA during the peak-hour. Noise levels at the closest live-aboard boats within the South Marina (represented by receiver 1) would increase by 6 dBA over existing conditions. At the exterior areas of residential locations along Makah Road in Woodway, represented by receivers 4 and 5, peak-hour traffic noise levels would increase by 7 to 9 dBA over existing noise levels, but absolute levels would stay well below the noise abatement criterion of 66 dBA for outdoor areas of residential uses. At the picnic areas of Edmonds City Park (receiver 6) and the closest outdoor

areas of the Edmonds Park Condominiums (receiver 7), 2030 peak-hour noise levels would increase by 1 to 2 dBA above the existing noise levels. At Brackett's Landing South Park (receiver 10), traffic noise levels would decrease by up to 11 dBA. It should be noted that such noise level decreases at receiver 10 are attributed only to traffic noise. Due to the contribution of nontraffic noise sources, overall decreases in noise levels at this location would be less than 10 dBA (more likely in the range of 6 to 8 dBA).

Ferry Noise

Changes in the types and number of daily ferry round trips are projected to occur under the Point Edwards Alternative. It is estimated that daily arrivals and departures will increase from 28 to 40 by the time of buildout conditions. To accommodate the increase in ferry trips, the ferry operating schedule would begin earlier in the day and would extend later in the evening. Operations by 2005 would include two Jumbo and one Super Class boats. By 2015 and thereafter, the terminal would be expected to operate with three Jumbo Class ferries. These more modern ferries are expected to be generally quieter than the type currently used on the Edmonds-Kingston ferry route.

Calculations of noise levels from ferry operations at Point Edwards were based on noise level measurements taken of ferry operations at the existing terminal. Assuming future ferry operations of three launching and docking events per hour, the hourly L_{eq} noise levels due to ferry launching and docking operations would be expected to range from 43 to 44 dBA at Marina Beach Park and the closest live-aboard boats in the South Marina (Receivers 11 and 1).

Total Project Noise Levels

Table 4-2 shows the total project noise levels from vehicular and ferry traffic for the Point Edwards Alternative. No project noise impacts would be expected under this alternative because overall project noise levels would be well below the FHWA criterion of 66 dBA and increases in noise levels would be below the "substantial" increase threshold of 10 dBA relative to existing conditions (as shown by Table 4-2). Increases over existing noise levels would be determined by and similar to increases due to vehicular traffic noise, as discussed under the "Traffic Noise" section above.

Alternative 3: Mid-Waterfront Site

Traffic Noise

Under Alternative 3, peak-hour L_{eq} traffic noise level modeling shows that, by 2030, vehicular traffic noise levels would increase by 2 to 3 dBA over existing conditions at the closest live-aboard boats within the North Marina (receivers 8 and 12). At the exterior areas of residential locations along Makah Road in Woodway (receivers 4 and 5), peak-hour traffic noise levels would increase by 5 to 8 dBA over existing noise levels, but absolute levels would stay well below the noise abatement criterion of 66 dBA for residential land uses. At the picnic areas of Edmonds City Park (receiver 6), 2030 peak-hour noise levels would increase by about 1 dBA above the

existing noise levels. At Brackett's Landing South Park (receiver 10), traffic noise levels would decrease by up to 11 dBA. It should be noted that such noise level decreases at receiver 10 are attributed only to traffic noise. Due to the contribution of non-traffic noise sources, overall decreases in noise levels at this location would be less than 10 dBA (more likely in the range of 6 to 8 dBA). Within portions of the Olympic Beach Park adjacent to the proposed ferry ramp (represented by receiver 13), future traffic noise levels would increase by as much as 8 dBA above existing noise levels and would be approximately 65 dBA, which would be just below the applicable noise abatement criterion of 66 dBA. The 8 dBA increase would be clearly perceptible to park users. The resulting noise levels could affect the continued use and enjoyment of the park.

Ferry Noise

Changes in the types and number of daily ferry round trips are projected to occur under the Mid-Waterfront Alternative. It is estimated that daily arrivals and departures will increase from 28 to 40 by the time of buildout conditions. To accommodate the increase in ferry trips, the ferry operating schedule would begin earlier in the day and would extend later in the evening. Operations by 2005 would include two Jumbo and one Super Class boats. By 2015 and thereafter, the terminal would be expected to operate with three Jumbo Class ferries. These more modern ferries are generally expected to be quieter than the type currently used on the Edmonds-Kingston ferry route.

Calculations of noise levels from ferry operations at Point Edwards were based on measurements taken of ferry operations at the existing terminal. If up to three launching and docking events per hour occur in the future, the hourly L_{eq} noise levels due to ferry launching and docking operations would be expected to range from 45 to 46 dBA at the closest residential structures and the closest live-aboard boats in the North Marina near the future ferry dock (receivers 9 and 12, respectively).

Total Project Noise Levels

Table 4-2 shows the total project noise levels from vehicular and ferry traffic for the Mid-Waterfront Alternative. Within portions of the Olympic Beach Park adjacent to the proposed ferry ramp (represented by receiver 13), future traffic noise levels would increase by as much as 8 dBA above existing noise levels and would be approximately 65 dBA, which would be just below the applicable noise abatement criterion of 66 dBA. No project noise impacts would be expected under this alternative at other parks, residential locations, or live-aboard boats because peak-hour noise levels at those locations would remain well below the FHWA criteria and would be below the "substantial" increase threshold relative to existing noise levels.

4.3.3 Mitigation Measures

No traffic or ferry noise impacts would be expected under the No Action, Point Edwards, or Mid-Waterfront Alternatives because future (2030) noise levels at representative receivers would remain below the peak-hour noise level criterion of

66 dBA and no substantial increases in noise levels would be expected at any locations under these alternatives. Therefore, noise mitigation would not be required for either project alternative.

4.4 Energy

4.4.1 Studies and Coordination

The following discussion is based on the energy discipline report (CH2M HILL, 1995), which is incorporated into this EIS by reference.

This section provides an evaluation of the potential impacts on energy use from the Edmonds Crossing project. The evaluation of energy requirements was conducted in accordance with FWHA guidelines for incorporating efficient energy use practices in the construction and development of transportation facilities. The section focuses on energy consumed by automobile, bus, and truck traffic in the general project area and construction-related energy consumption using the input-output method. The section also provides a qualitative discussion of the energy impacts associated with ferry and train traffic.

The evaluation considers both the direct and indirect energy impacts of the proposed facility. Direct energy impacts refer to the energy consumed by vehicles using the facility. Indirect impacts include energy used during construction of the facility.

The Edmonds Crossing project deals with a multimodal terminal facility rather than a single roadway; vehicles will travel on numerous connecting roadways. As a result, this section takes a rather expansive view of the project area by considering the energy impacts associated with traffic throughout the City of Edmonds rather than focusing strictly on traffic using the terminal.

Estimates of the energy consumed by vehicular traffic associated with the project were prepared based on procedures outlined in *Energy and Transportation Systems* (Caltrans, 1983). Estimated VMT during the P.M. peak hour and total annual VMT were generated as part of the analysis of the transportation impacts associated with the project. Assumed average travel speeds and a percentage breakdown of traffic into light-duty vehicles and heavy-duty vehicles are also provided.
Estimated gallons per mile (gpm) for different types of vehicles and estimated British thermal units per gallon (Btu/g) of gas were obtained from Caltrans (1983). Total annual consumption was estimated by multiplying VMT by gas mileage estimates for each alternative.

4.4.2 Impacts

The impacts of energy use during operations of each alternative are shown in Table 4-3. VMT was computed using the recently updated City of Edmonds traffic forecasting model. Future P.M. peak travel on each roadway link within the modeled area was summed for each alternative. Annual VMT was estimated by expanding the P.M. peak VMT by a factor of 10 for daily travel, then by a factor of 320 to reflect average annual daily travel. As shown, there would be very little

Table 4-3
Energy Use During Operation

Vehicle Type	Total Percent of VMT[a]	Average Annual VMT[a]	Average Speed (mph)[a]	Average Fuel Consumption (gpm)[b74]	Annual Energy Use (billion Btu)	Annual Fuel Consumption (gallons)
2002: Existing Conditions						
Light-duty vehicles	97	133,656,005	30	0.039	652	5,213,000
Heavy-duty vehicles	3	4,133,691	30	0.141	73	583,000
Total	100	137,789,696			725	5,796,000
2008: Phase 1 for Build Alternatives						
Alternative 2 (Point Edwards)						
Light Duty Vehicles	97	147,666,530	30	0.039	720	5,759,000
Heavy Duty Vehicles	3	4,567,006	30	0.133	76	607,000
Total	100	152,233,536			796	6,366,000
Alternative 3 (Mid-Waterfront)						
Light Duty Vehicles	97	148,186,667	30	0.039	722	5,779,000
Heavy Duty Vehicles	3	4,583,093	30	0.133	76	610,000
Total	100	152,769,760			799	6,389,000
2015: Opening Year (Full Buildout)						
Alternative 1: No Action						
Light Duty Vehicles	97	161,202,639	30	0.038	766	6,126,000
Heavy Duty Vehicles	3	4,985,649	30	0.137	85	683,000
Total	100	166,188,288			851	6,809,000
Alternative 2: Point Edwards Site						
Light Duty Vehicles	97	159,974,107	30	0.038	760	6,079,000
Heavy Duty Vehicles	3	4,947,653	30	0.137	85	678,000
Total	100	164,921,760			845	6,757,000
Alternative 3: Mid-Waterfront Site						
Light Duty Vehicles	97	161,019,721	30	0.038	765	6,119,000
Heavy Duty Vehicles	3	4,979,991	30	0.137	85	682,000
Total	100	165,999,712			850	6,801,000

Table 4-3
Energy Use During Operation

Vehicle Type	Total Percent of VMT[a]	Average Annual VMT[a]	Average Speed (mph)[a]	Average Fuel Consumption (gpm)[b74]	Annual Energy Use (billion Btu)	Annual Fuel Consumption (gallons)
2030: Design Year						
Alternative 1: No Action						
Light Duty Vehicles	97	181,981,436	30	0.038	864	6,915,000
Heavy Duty Vehicles	3	5,628,292	30	0.137	96	771,000
Total	100	187,609,728			961	7,686,000
Alternative 2: Point Edwards Site						
Light Duty Vehicles	97	182,460,259	30	0.038	867	6,933,000
Heavy Duty Vehicles	3	5,643,101	30	0.137	97	773,000
Total	100	188,103,360			963	7,706,000
Alternative 3: Mid-Waterfront Site						
Light Duty Vehicles	97	183,702,759	30	0.038	873	6,981,000
Heavy Duty Vehicles	3	5,681,529	30	0.137	97	778,000
Total	100	189,384,288			970	7,759,000

VMT = vehicle miles traveled
gpm = gallons per mile
mph = miles per hour

Light-duty vehicles include light-duty gas vehicles and trucks, light-duty diesel vehicles and trucks, and motorcycles; Heavy-duty vehicles include heavy-duty gas and diesel vehicles.

Sources:
[a]CH2M HILL, 2003
[b]ODOT, 1997.

difference between the three alternatives; the annual energy use of each alternative in the 2030 design year would be approximately 33 percent greater than estimated energy use in 2002. The difference from 2002 levels would be primarily the result of increased vehicular traffic from growth in the Edmonds area; very little additional energy use would be expected directly from the project.

Differences between the alternatives would be the result of marginally different distances for vehicles traveling to and from the ferry terminal in the different locations. The transportation model used as the basis of the operational energy estimates assumed that any increase in transit use (and the corresponding drop in SOV use) between now and 2015 would occur regardless of whether or not the project proceeds. If, as expected, the project itself facilitates transit, relatively less energy would be used for the two build alternatives than for the No Action Alternative.

One difference in energy consumption between the two build alternatives and the No Action Alternative is not based on VMT, but rather based on the fact that both the Point Edwards and Mid-Waterfront Alternatives would provide storage for almost four jumbo-class ferry vessels (over 800 vehicles) within the project area and off of SR 104. The advantage of this on-site storage capacity, in terms of energy consumption, is that, rather than a slow-moving queue of vehicles along SR 104, as is currently experienced, drivers would be able to park once and turn off their engines while waiting.

Ferry and Rail Impacts

Although ferry and rail traffic are expected to increase commensurate with overall levels of population and economic activity in the region, construction and operation of the project would not be expected to result in major differences in energy consumption for these modes of transport. The location of the terminal would also not be expected to have a critical impact on energy use from ferry or rail operations.

By 2015, it is anticipated that a third boat, a 130-car Issaquah-class ferry, would be operating from the ferry terminal. Ferry schedules, ridership, and capacity would be expected to be similar, regardless of whether the terminal is located at the Point Edwards or Mid-Waterfront locations. The ferry transport route may be slightly shorter at Point Edwards, which would reduce the time boat engines are under load, thereby reducing fuel consumption.

The energy impacts associated with rail operations would likely be similar for each build alternative. It was assumed that a second railroad track would be added and that all intercity and commuter trains would stop at Edmonds. Under the No Action Alternative, the ridership would be the same as for the build alternatives.

However, in the No Action Alternative, the likelihood of delays would increase because of the compressed schedule created by a third boat combined with a single slip. In this instance, increased fuel usage from longer lines and idling automobiles would result.

Alternative 1: No Action

Design Year

For the No Action Alternative, annual fuel consumption in 2030 is projected to be about 7.7 million gallons, with about 6.9 million gallons resulting from light-duty gas and diesel vehicles (Table 4-3). This total amount would correspond to 961 billion Btu. Average annual VMT is projects to be approximately 188 million miles. Compared to the 2002 baseline , fuel usage under the No Action Alternative would increase by 33 percent in 2030.

Opening Year

In 2015, when full buildout would be completed under the build alternatives, annual fuel consumption for the No Action Alternative is projected to be about 6.8 million gallons with about 6.1 million gallons resulting from light-duty vehicles (cars, small trucks, and motorcycles) and the remainder from heavy-duty gas and diesel vehicles (Table 4-3). This amount would correspond to 851 billion Btu. Average annual VMT would be about 166 million miles. Compared to the 2002 baseline, fuel usage under the No Action Alternative would increase by 17 percent in 2015.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Design Year

In 2030, annual fuel consumption associated with the Point Edwards Alternative is projected to be about 7.7 million gallons. This amount would correspond to 963 billion Btu, which is almost identical to the No Action Alternative for the year 2030. VMT is projected to be 188 million miles. Compared to the 2002 baseline, fuel usage under Alternative 2 would increase by the same percentage as the No Action Alternative (33 percent) in 2030.

Opening Year

Differences in long-term operation impacts between the Point Edwards Alternative and the Mid-Waterfront Alternative are directly related to estimates of VMT. Differences in VMT can be attributed to the following factors:

- Travel distance along the primary access route (SR 104) varies for each alternative location of the ferry terminal/multimodal center. The distance is shortest for the Point Edwards Alternative.

- Each alternative affects travel through the downtown area differently. For trips to and from the north, this distance is longest for the Point Edwards Alternative.

In addition, the volume of ferry traffic passing through downtown varies for each alternative.

These and other stochastic factors in the travel model can affect the patterns of VMT among the alternatives. It should be emphasized that the differences in VMT

among the alternatives (0.9 percent in magnitude) may not be important in the context of the model input variables.

At full buildout, annual operational energy impacts are estimated to be about 6.8 million gallons of fuel, or 845 billion Btu. Total VMT would be approximately 165 million miles. Fuel usage under Point Edwards would differ from the No Action Alternative by less than 1 percent.

Phase 1

In 2008, the annual operational energy impacts associated with Point Edwards are estimated to be about 6.4 million gallons of fuel or 799 billion Btu (Table 4-3). Total VMT was estimated to be approximately 153million miles.

Alternative 3: Mid-Waterfront Site

Design Year

Operational energy impacts for design year 2030 are estimated to be approximately 7.8 million gallons of fuel, or 970 billion Btu. Average annual VMT would be about 189 million miles. Fuel usage under Alternative 3 would differ from the No Action Alternative by less than 1 percent in 2030. Compared to the 2002 baseline, fuel usage under Alternative 3 would increase by 33 percent in 2030 (comparable to the No Action Alternative and Modified Alternative 2).

Opening Year

Annual operational energy impacts during the opening year (at full buildout) are estimated to be about 6.8 million gallons of fuel, or 850 billion Btu. Total annual VMT would be about 166 million miles. Fuel usage under Alternative 3 would differ from the No Action Alternative by less than 1 percent.

Phase 1

In 2008, the estimated total annual operational energy use associated with the Mid-Waterfront Alternative is 6.4 million gallons of fuel or 796 billion Btu (Table 4-3). Total annual VMT was estimated to be approximately 152 million miles.

4.4.3 Mitigation Measures

The main reason for this project is to provide a key piece of infrastructure that would support increased non-SOV use. To the extent that this project facilitates reduced use of SOVs, energy usage in the greater Edmonds area during operation of the facility would decline, so no mitigation would be necessary.

4.5 Geology and Soils

4.5.1 Studies and Coordination

The analysis of geology and soils impacts is based on information from U.S. Geological Survey maps, the *Soil Survey of Snohomish County Area, Washington* (SCS, 1983), the *Coastal Zone Atlas of Washington* (Ecology, 1979), and the Snohomish County *Geologic Hazard Maps* (GeoEngineers, 1991). Additional sources of information included drilling exploration logs from various geotechnical and environmental reports, which are listed in the bibliography (Appendix D). A field reconnaissance of the project area was also performed. The following discussion is based on the geology and soils discipline report (CH2M HILL and Hong West, 1995), which is incorporated into this EIS by reference.

4.5.2 Impacts

Alternative 1: No Action

This alternative would not result in impacts on earth resources.

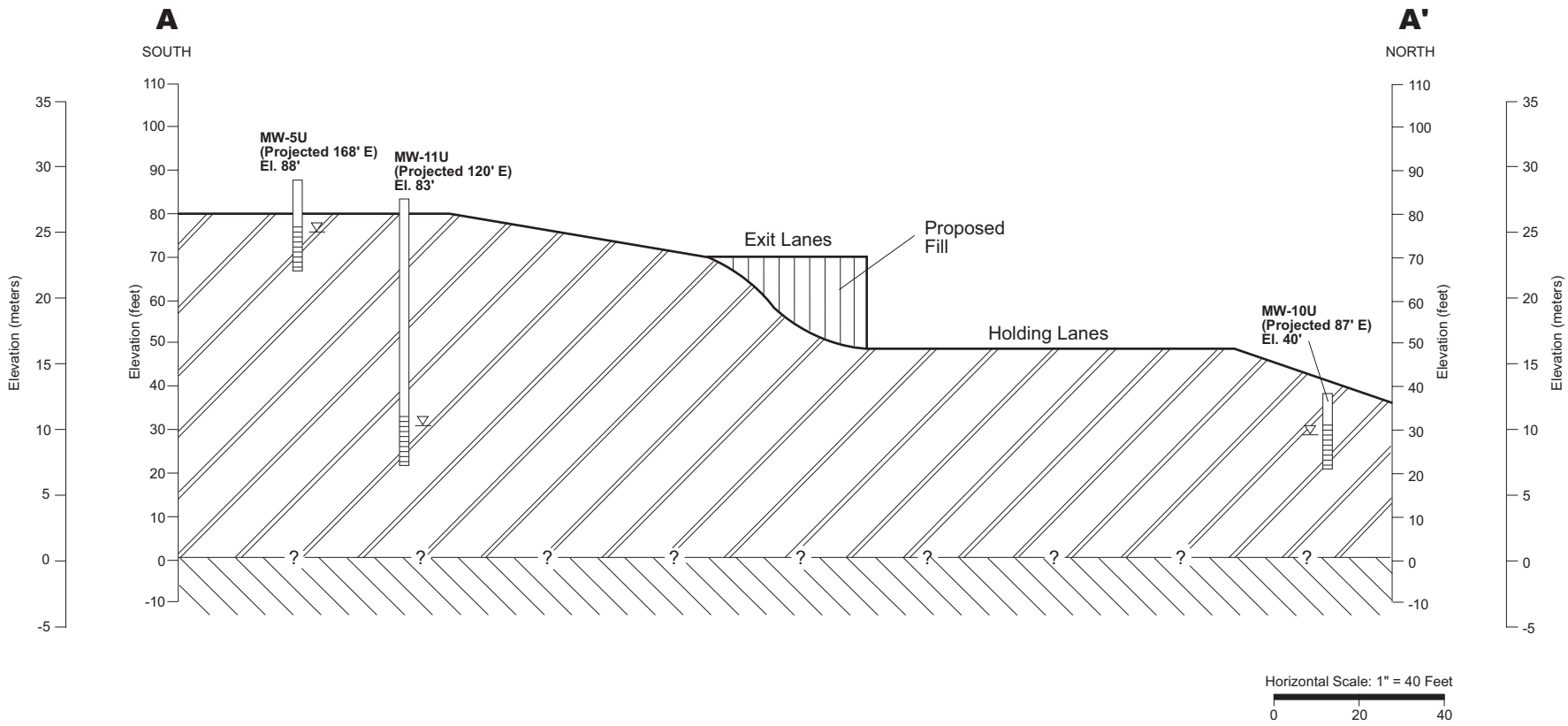
Impacts Common to All Build Alternatives

Full Buildout

After construction, little erosion and movement of surface soils would be expected once vegetation has become established. Generally, revegetation with hydroseeding would take two to three weeks, depending on the season. However, increased runoff from impervious surfaces, such as paved roads and parking areas, could increase erosion. Erosion and scouring of materials around piles located offshore could reduce the lateral capacity (see Section 4.6, Waterways and Hydrological Systems). It does not appear that the littoral drift would be affected by the construction of the pile-supported offshore structures; however, further evaluation would need to be performed during design.

The project area is located within Seismic Zone 3, indicating that the area is susceptible to moderately high seismic activity. This seismic zone includes the entire Puget Sound region. During a major seismic event, substantial ground motion could occur at the site. The potential for strong ground motion in the project area is considered no greater than for the Puget Sound area in general. Therefore, moderate levels of earthquake shaking should be anticipated during the design life of the facility.

No seismic hazard areas are mapped in the project area. However, the available subsurface information suggests that portions of the project area may be subject to liquefaction as a result of earthquake shaking. These areas include the elevationally lower portions of the project area where looser fill deposits occur, particularly where modified land is shown in Figures 4-1 through 4-3, and also areas offshore on the underwater slope where loose fill materials and littoral drift deposits occur. In the event that liquefaction develops following a seismic event, structures and paved



LEGEND

- Water Level
- Inferred Geologic Contact
- Monitoring Well Screened Depth
- Hand Auger

DESCRIPTION OF GEOLOGIC UNITS

- ml — Modified Land (fill)
- Qw — Whidbey Formation
- Qtb — Transitional Beds

Note: Cross-section based on Hong West and Associates, Inc.'s interpretation of subsurface data provided in reports by EMCON, Inc. and GeoEngineers, Inc. (cited in Bibliography)

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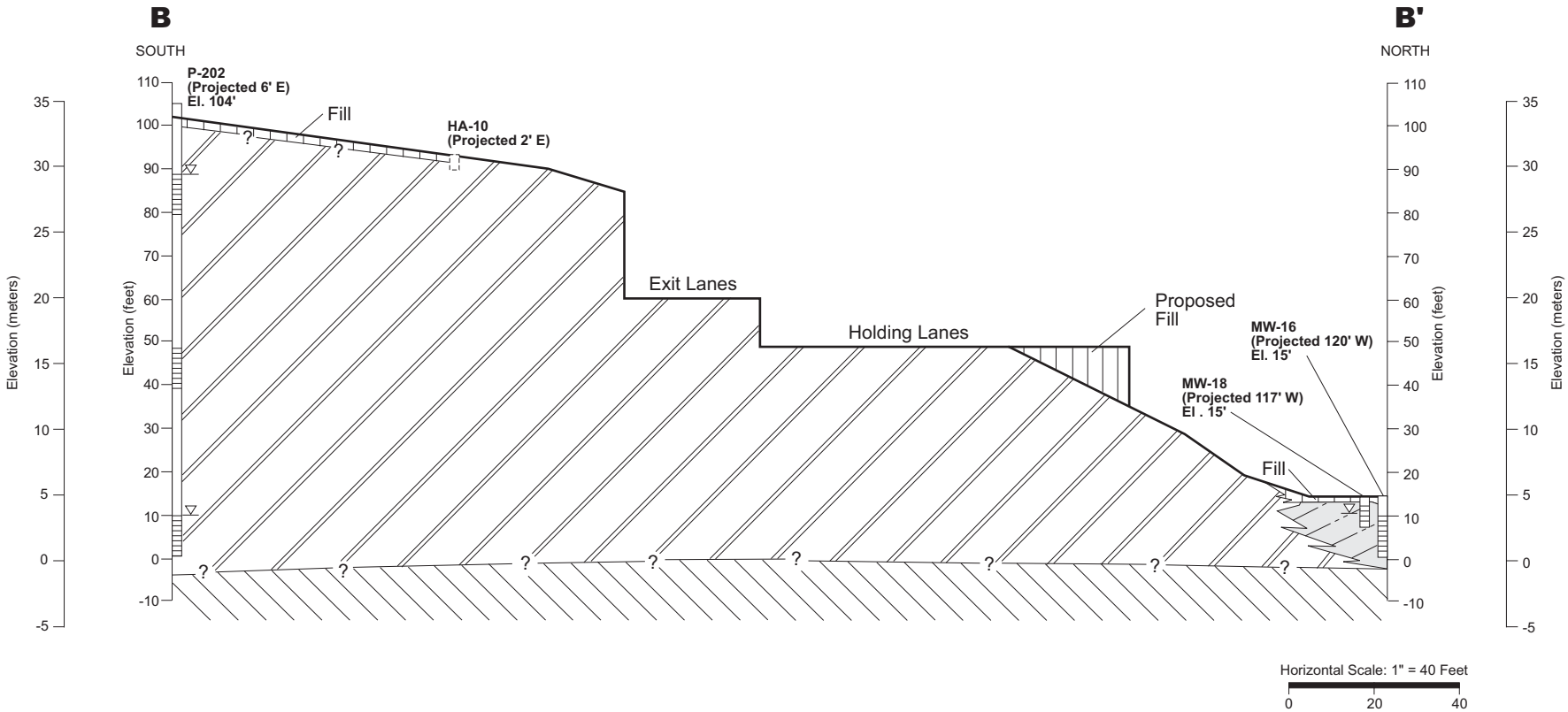
Figure 4-1

Generalized Subsurface Profile A – A'



LEGEND

- Water Level
- Inferred Geologic Contact
- Monitoring Well Screened Depth
- Hand Auger

DESCRIPTION OF GEOLOGIC UNITS

- ml — Modified Land (fill)
- Qtb — Transitional Beds
- Qw — Whidbey Formation
- Beach Deposits

Note: Cross-section based on Hong West and Associates, Inc.'s interpretation of subsurface data provided in reports by EMCON, Inc. and GeoEngineers, Inc. (cited in Bibliography)

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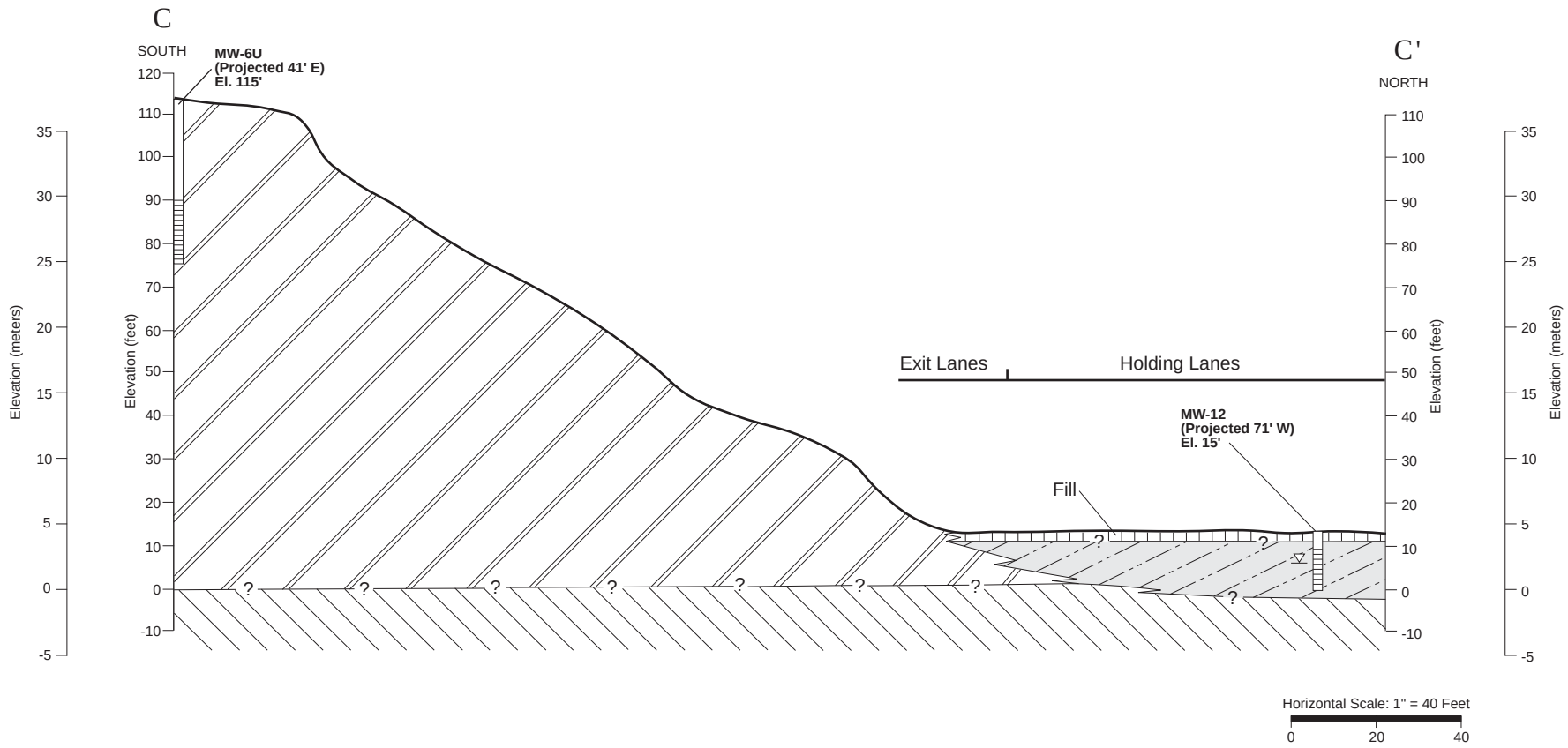
Figure 4-2

Generalized Subsurface Profile B – B'



LEGEND

- Water Level
- Inferred Geologic Contact
- Monitoring Well Screened Depth
- Hand Auger

DESCRIPTION OF GEOLOGIC UNITS

- ml — Modified Landfill (fill)
- Qtb — Transitional Beds
- Qw — Whidbey Formation
- Beach Deposits

Note: Cross-section based on Hong West and Associates, Inc.'s interpretation of subsurface data provided in reports by EMCON, Inc. and GeoEngineers, Inc. (cited in Bibliography)

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Figure 4-3

Generalized Subsurface Profile C – C'

areas could move both vertically and horizontally. An analysis of soil liquefaction potential may be required during the design stage of the selected alternative. Design of structures to resist earthquake shaking and also secondary effects, such as liquefaction, may be required.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

Operational impacts would be similar to those described for both build alternatives. The underwater slope at the ferry pier may become unstable if it becomes steeper. This condition may occur naturally with time as sediment accumulates on the underwater slope in the sheltered area created by the pile-supported terminal or from sediment removal by scour or the littoral current. The stability of the underwater slope could decrease slightly or the slope could undergo substantial movement under seismic shaking.

Portions of the existing seawall surrounding the southern end of the Port of Edmonds Marina may impact the construction of a pile supported pier and may require removal and/or replacement

Phase 1

Long-term impacts for Phase 1 would be similar to those common to both build alternatives.

Alternative 3: Mid-Waterfront Site

Full Buildout

Operational impacts would be similar to those described above for both build alternatives. The need for armoring to protect the underwater slope under this alternative will be evaluated during the later design phase of this project.

Phase 1

Impacts under Phase 1 of Modified Alternative 2 would be similar to those common to both build alternatives.

4.5.3 Mitigation Measures

Vegetation would be established to decrease erosion from surface runoff. Best management practices (BMPs) would be implemented during and after construction until site vegetation has been reestablished. Examples of during-construction erosion mitigation measures may include stabilized construction entrances, pipe slope drains, check dams, temporary cover (such as mulching or plastic), and strategically installed silt fences. During construction, water quality will be monitored to ensure compliance with Ecology standards.

4.6 Waterways and Hydrological Systems

4.6.1 Studies and Coordination

The following discussion is based on the waterways and hydrological systems discipline report (CH2M HILL *et al*, 1995), which is incorporated into this EIS by reference, and on subsequent analyses of regulatory requirements for stormwater management that would apply to the project.

Study Methodology

Existing surface water hydrology, drainage, and groundwater conditions in the project vicinity were characterized through a review of available literature sources, a field reconnaissance, and discussions with individuals familiar with water resources and constructed drainage systems within the project area.

Using the results of the characterization of existing conditions, analyses of potential impacts were performed. The analysis of impacts on drainage features associated with construction activities is based on available information sources, including environmental assessments for similar projects. The analysis of long-term operational impacts on drainage features is based primarily on development of storm event runoff estimates, which required information on land use characteristics, soils, topography, and precipitation.

The project area was visually surveyed on several occasions in May and June of 1995 to map drainage features and assess existing flow conditions. Locations of storm drain inlets and outfalls, culverts, and major structures in the drainage system were noted. Areas where drainage facilities are lacking or deficient were also noted. Stream flow measurements were obtained in Willow Creek near the site on June 17 and July 17, 1996.

The physical environment was analyzed by using field measurements collected specifically for this project and existing data and studies from various sources. The following issues of concern were studied and related to the two alternative sites and the existing ferry terminal site where possible:

- Wind speed and direction
- Wind waves
- Current speed and direction
- Water temperature, salinity, and density
- Coastal flooding
- Propeller-induced seabed scour
- Littoral drift

Simultaneous observations of wind speed and direction, currents, and waves were made in 1995 from locations on the UNOCAL pier and in the vicinity of the pier shown in Figures 3-5 and 3-6. Wind observations were made from February 23 through April 4, and wave observations were made by using a Waverider system from March 19 through April 28. Additional wind data for the existing UNOCAL

pier and the existing ferry terminal were analyzed from a study by Jahren (1991), which correlated wind velocity versus ferry boat maneuvers during docking and undocking.

For the present study, wind data from the 1995 observations were correlated with data from Jahren (1991) and wind data from a NOAA National Weather Service long-term observation site at West Point, 8.7 nautical miles south of the UNOCAL pier. West Point wind data were available for a 19-year period and included both manually observed winds and data from an automatic weather station. A set of regression equations derived from return-period wind events, such as the 100-year event, were determined for both the Point Edwards and Mid-Waterfront Alternatives. The wind data were also used in a wave prediction model. Frequency of occurrence for winds and waves were determined for the Point Edwards site based on the correlation of observed winds at the UNOCAL pier and 16-years of available wind data from NOAA's automated station at West Point.

Wave data from the automated Waverider buoy system were used to calibrate a Corps wave prediction model for restricted waters (i.e., water bodies surrounded by nearby land masses, such as Puget Sound). Once the wave prediction model was calibrated, it was used to generate return-period wave heights and periods based on the winds described above for the Point Edwards and Mid-Waterfront Alternatives.

Current speed and direction were measured from a single mooring using two automated current meters, one located near the sea surface and the other approximately 10 feet off the seabed. Other data also derived from the two current meters included water temperature, salinity, and density. No current measurements were made for the Mid-Waterfront Alternative, because the currents are generally much weaker at this location and would be similar to those at the existing ferry terminal.

In addition to the field observations and analyses described above, coastal flooding and propeller-induced seabed scouring were analyzed using existing data and previous studies. Coastal flooding from storm events and high tides or from distant tsunami sources in the Pacific Ocean were examined. The estimated 100-year return-period stillwater elevation for a storm tide was 14.2 feet MLLW datum and does not include additional elevations from wave runup on the shoreline. Distantly generated tsunamis historically have generated a temporary rise of approximately 0.8-foot maximum on the tide level at the time of tsunami arrival in the Seattle region.

An analysis of the potential for scouring was completed based on a computer model for the Jumbo Mark II (JM2) class ferry that will be operating on the Edmonds-Kingston run. Near-bottom seabed current speeds from the model for the JM2 ferry were then compared with those for the Jumbo class ferry that have been operating for years on the Edmonds-Kingston run. Adjustments were then made to the Jumbo class ferry scour area and combined with model results to estimate scour areas for each slip at the Point Edwards and the Mid-Waterfront sites.

The model is based on a study by Yi-Chung Liou and J.B. Herbich of Texas A&M University (1976) and predicts propeller-induced currents at various distances

behind and below the propeller, including near-bottom (3 feet above the seabed) current speeds. The model uses the near-bottom current speed to compute shear stress and shear velocities, which predict the grain diameter of noncohesive sediment that will be set into motion. The analysis for this project was limited to determining the approximate area of scour and not the size of grain sizes moved. In general, currents exceeding approximately 0.33 foot/second will move sand-sized particles.

Because both the Jumbo and JM2 propellers normally operate at 50 rpm when maneuvering near and holding position at the slip, only scour resulting from 50 rpm was examined. The scour area at the existing Main Street ferry terminal was considered to be the equilibrium scour area based on years of ferry operations; seasonal and short-term variations in the scour pattern are not known.

The JM2 ferry has a single propeller at each end, both 13 feet in diameter and a draft of 18 feet, compared to the Jumbo class ferry with 12-foot-diameter propellers and an 18-foot draft. Figure 4-4 shows a plot of the bottom velocities for various water depths up to 1,300 feet from the propeller for the JM2 ferry. Speeds of the current are strongest within this distance. However, sand-sized particles are predicted to be set in motion approximately 3,200 feet from the propeller at 50 rpm if the curves are extended. Depths below the sea surface in which sediment transport could occur ranged from -10 to -50 feet MLLW for the Jumbo ferry and -12 to -60 feet for the JM2 ferry.

This requires that the ferry hold position sufficiently long for a steady-state current to be created in the water behind the propeller. With depth contours sloping downward away from the propeller, the actual scour depth is less than predicted by the modeling. At the existing Main Street ferry terminal, the actual limit of the scour is -50-foot MLLW.

Propeller-induced bottom current velocities for the JM2 ferry are 1.16 to 1.20 times those of the Jumbo ferry for water depths ranging from 25 to 50 feet. (Jumbo ferry current velocities may be found in the waterways and hydrological systems discipline report [CH2M HILL, 1995].) The adjustment factor of 1.20 was used to increase the dimensions and depth of the existing scour pattern at the Main Street ferry terminal to determine the pattern for the JM2 ferry.

At each slip, the scour area is fan-shaped and extends seaward from the inshore limit of scour. For the JM2 ferry, this inshore scour limit was estimated to be approximately 170 feet inshore from the face of the ferry slip, terminating at -12-foot MLLW depths. This limited scour results from momentary forward thrust of the bow propeller when the ferry is landing and from propeller wash as the ferry gets underway from the slip. The limit of scour is a line at a 16-degree angle to the centerline of the ferry dock, and extends to the -60-foot MLLW contour.

The quantity of sand transported southward by littoral drift in winter and summer is approximately 9 percent of the northward transport (Ecology, 1979). According to Ecology (1979), the transport rate northward is 11,000 cubic yards in winter, and summer transport towards the south is 1,000 cubic yards. Because of the Edmonds Marina breakwaters, the Marina Beach lies within this transport pathway and not

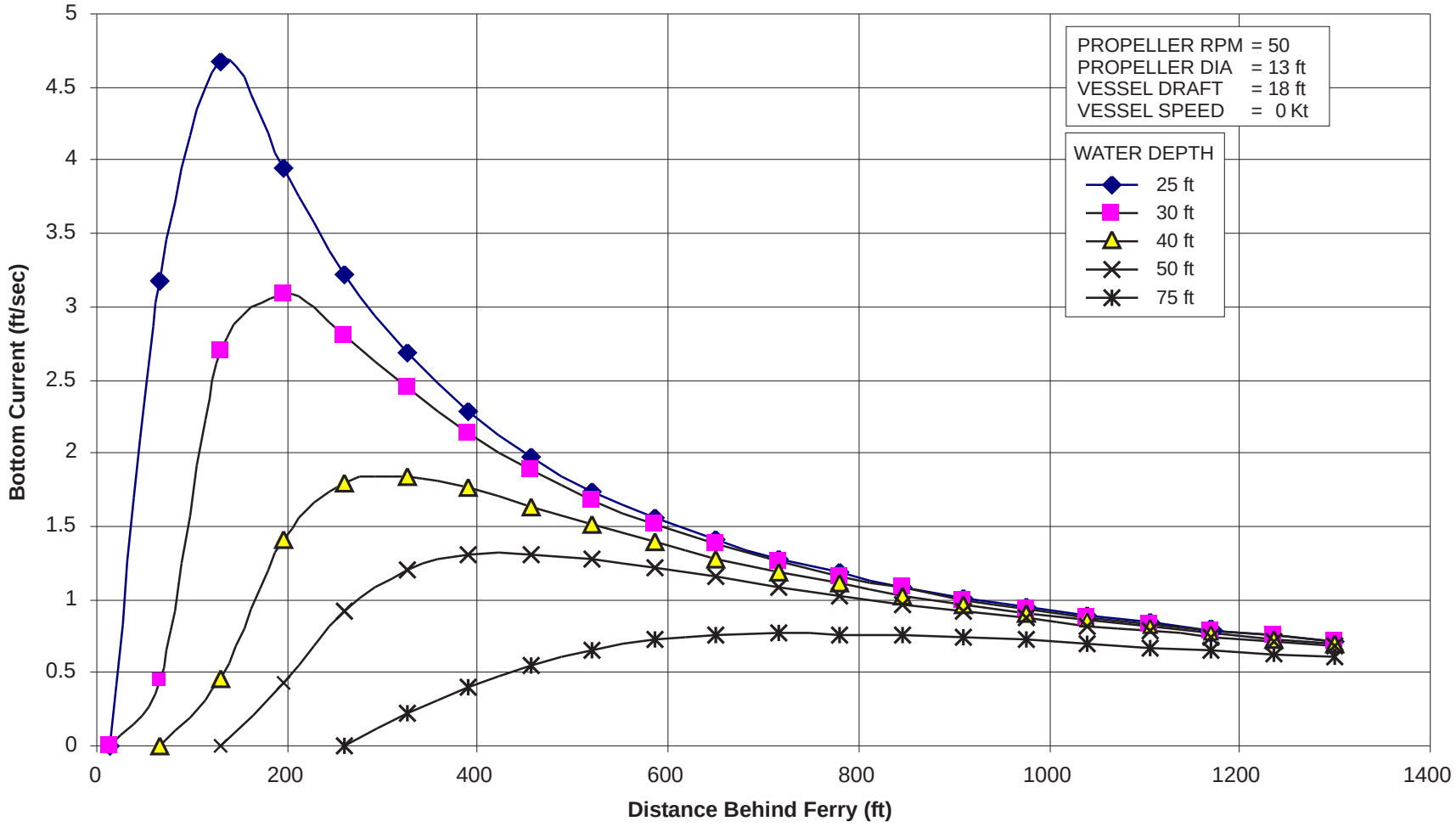

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Figure 4-4

Propeller-Induced Bottom Currents for Jumbo Mark II Ferry

the one along the Edmonds Waterfront where there is a persistent southwesterly transport of 15,000 cubic yards in summer and 5,000 cubic yards in winter.

There is a very large net transport of sand into the Marina Beach reach based on Ecology (1979). The Edmonds Marina breakwaters act as a sand trap for the northward littoral transport path, which results in a stable beach. The source of sand for the Marina Beach is from: (1) bluff erosion south of the site, providing the material overtops the railroad tracks and enters the intertidal zone, (2) transport of sand from offshore to the beach during high wave events, and (3) from the intertidal beach adjacent to the railroad tracks south of the site.

Littoral drift consists of longshore drift more or less parallel to the beach contours and onshore-offshore transport more or less perpendicular to the contours. A more refined analysis was performed for the longshore transport for the existing condition and with the breakwater and wave barriers in place for Modified Alternative 2. A modified wave energy flux method was used to estimate the relative values of the annual longshore drift at the Marina Beach following procedures in Corps *Shore Protection Manual* (1984). Computation of actual transport rates in and out of the 700-foot reach was not done because seasonal surveys of the beach over a number of years have not been done; such surveys are needed to determine reliable values.

Agencies and organizations that were contacted for information are included in Appendix A.

4.6.2 Impacts

The following discussion of potential impacts on drainage features within the project area is general in nature because the information available on drainage problems and flow conditions in the Edmonds waterfront area is somewhat limited. The analysis of potential impacts is based in part on knowledge of typical drainage problems associated with urban runoff, and in part on estimates of impervious surface coverage in the project area under each alternative. Table 4-4 compares total impervious surface area in the project vicinity under each alternative, based on a 155-acre geographic area encompassing all of the alternatives.

There would be no substantial long-term impacts on local groundwater resources from project operations. Development on the UNOCAL property would reduce the extent of infiltration of precipitation and runoff that contributes to recharge of the shallow groundwater in that area. As described in the Affected Environment section for Waterways and Hydrological Systems (3.2.5), shallow groundwater flows through the UNOCAL property, most likely towards the northwest following the slope of the ground surface. Of the new impervious surface area that would be created by the multimodal project development, approximately 6 acres or less would be constructed on the UNOCAL property under the development alternatives. In comparison to the surrounding recharge area for the underlying shallow groundwater aquifer, that amount of impervious surface addition would not likely cause a noticeable difference in groundwater recharge patterns. The potential minor effects of a slight reduction in the amount of shallow groundwater that discharges into Edmonds Marsh from the south would be overshadowed by the effects of much greater tidal exchange within the marsh as a result of modifications to the tide gate

downstream of Edmonds Marsh. None of the project alternatives would involve long-term groundwater withdrawals, so groundwater levels in the project area would remain essentially unchanged. Therefore, the following discussion of long-term impacts focuses on stormwater runoff characteristics and offshore current, wave, and propeller scour patterns. Refer to the "Water Quality" section (Section 4.7) for information pertaining to groundwater quality.

Table 4-4
Impervious and Pervious Surface Areas in the Vicinity of the Edmonds Crossing Project Alternatives

Alternative	Total Upland Site Area[a] (acres)	Impervious Surface Coverage (acres)	Pervious Surface Coverage (acres)
No Action	155	80.4	74.6
Point Edwards Alternative	155	89.8	65.2
Mid-Waterfront Alternative	155	87.4	67.6

[a]*Total site area encompasses land bounded by the existing ferry terminal to the north, the Puget Sound shoreline to the west, the upper yard of the former UNOCAL facility to the south, and State Route 104 (Pine Street) to the east.*

Note: Impervious surfaces include roadways, parking lots, rooftops, sidewalks, and other developed areas. Pervious surfaces include forested, beach and shoreline, marsh, and grassy areas, plus 15 percent of developed areas to account for landscaping or other minor pervious surfaces.

Alternative 1: No Action

The No Action Alternative would result in no impact on hydrologic conditions or drainage system operations in the project area, because no grading work would be undertaken and no modifications to runoff patterns would occur.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

This alternative would not cause any adverse hydrologic impacts or other drainage system impacts in the project area because of the proposed direct discharge of site runoff to Puget Sound via the existing Willow Creek culvert under Marina Beach Park. That culvert would otherwise be abandoned following “daylighting” of Willow Creek between the multimodal terminal and Puget Sound and, thus, offers a convenient opportunity for management of site runoff discharges. Although peak rates of runoff from the existing UNOCAL property are expected to increase slightly under this alternative, because of greater impervious surface coverage with the new ferry access roadway and the multimodal center, the increased runoff flows would bypass Edmonds Marsh and lower Willow Creek. The capacity of the 48-inch-diameter Willow Creek culvert that discharges to Puget Sound downstream of the UNOCAL site is estimated to be about 107 cfs (R.W. Beck, 1991), which is far greater than the peak runoff rates that would be generated on the project site.

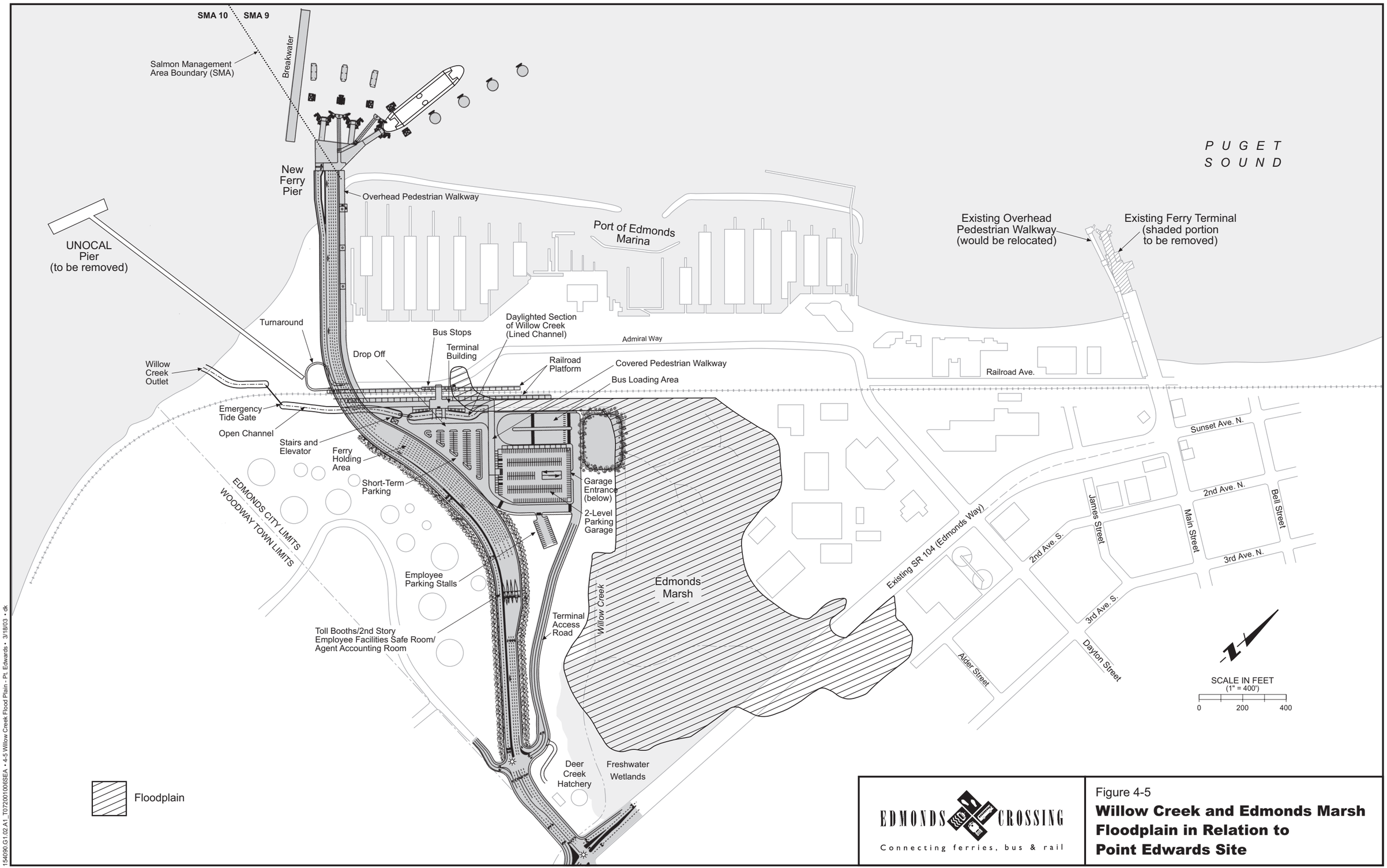
Willow Creek would be daylighted along much of its length downstream of Edmonds Marsh to create an open stream channel. The flow conveyance capacity of the new channel would equal or exceed the capacity of the existing culvert. However, when tide levels in Puget Sound would inundate a portion of the Willow Creek channel, the channel conveyance capacity would be substantially reduced.

The proposed stream channel design for the Preferred Alternative does not incorporate water level control in the marsh, except under emergency conditions. During conditions of extremely high tides coupled with a strong storm surge, City staff may manually close a tide gate to prevent the marsh water level from overtopping the existing levee on the north side of the marsh. This action would be taken, if needed, to protect a business park from flooding. Such an event might occur on the order of once every 1 to 3 years and for several hours per event. During all other times, the Willow Creek culverts and channel between Edmonds Marsh and Puget Sound would be completely open to tidal surge and freshwater outflow. Periodic operation of the tide gate would not alter the ecological functions of the salt marsh or perimeter freshwater marsh, as the hydraulic control would be so brief and so infrequent. Since the flow capacity of the new culverts and new open channel would be much greater (less restrictive) than the current conditions, a greater amount of saltwater would enter the marsh in flood tides and ebb out of the marsh on a daily basis. As a result, the size of the salt marsh area is expected to increase. The spatial extent of saltmarsh expansion is unknown, however, as it has not been modeled. It is expected that occasional tide gate operations would have a greater effect on local water levels than minor increases in peak flows from the site.

Modifications to the Willow Creek configuration downstream of Edmonds Marsh under the Preferred Alternative could result in lower marsh water levels at times of low tides relative to existing conditions because the new Willow Creek culverts and open channel would drain the marsh more effectively. The current design plan for the Willow Creek channel and the new culverts within it downstream of the marsh does not include raised culvert invert elevations, or a weir, to impound shallow water in the marsh as occurs under existing conditions.

All development associated with this alternative would occur outside the 100-year floodplain for Willow Creek and the associated marsh area (see Figure 4-5). Thus, in accordance with Executive Order 11988 (Floodplain Management), the project would not result in any loss of floodplain storage and would minimize any flooding related impacts to human, natural, or cultural resources.

The approximate scour area for the Modified Point Edwards Alternative is shown in Figure 4-6. Slips 1 and 2 are in deep water, with the face of the docks located in 80-foot MLLW water depths. The face at Slip 3 is in –70-foot MLLW water depth. The seabed has a steep slope in the region landward of the end of the slips, so propeller currents would scour non-cohesive sediments, such as sand. At all three slips, scour would cover an area about 120 feet in length, starting approximately 40 to 50 feet inshore from the seaward end of the slips. The scour area would extend out 50 to 90 feet from either side of the centerline of each slip. The propeller scour along the southeast side of Slip 3 would not be expected to erode the seabed



154090.G1.02.A1_T072001006SEA • 4-5 Willow Creek Flood Plain - Pt. Edwards • 3/18/03 • dk

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Figure 4-5

Willow Creek and Edmonds Marsh Floodplain in Relation to Point Edwards Site

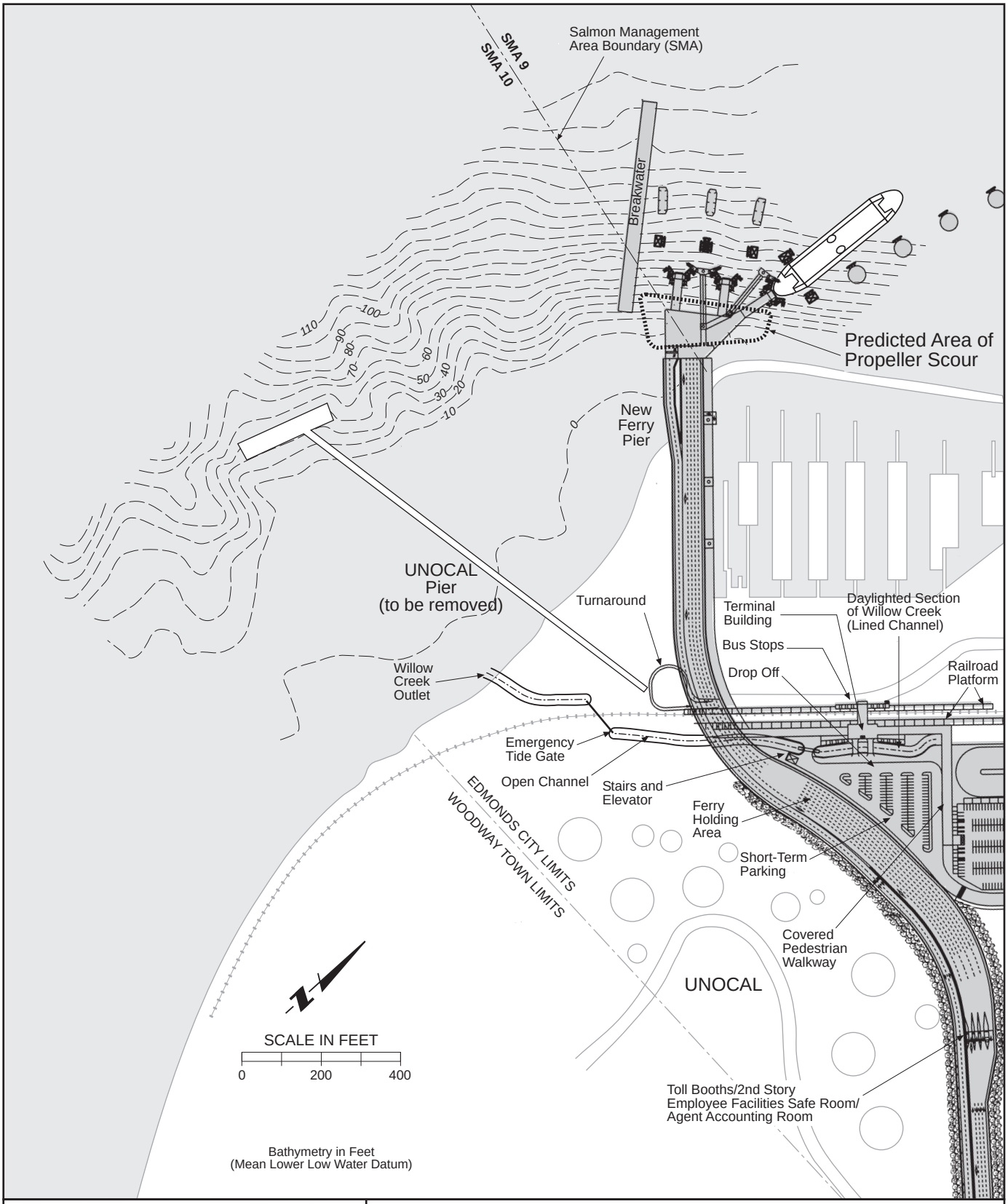

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Figure 4-6

Predicted Area of Scour for Modified Alternative 2 (Preferred Alternative): Point Edwards Site

fronting the existing Edmonds Marina breakwater. Propeller currents would not be expected to cause sediment movement seaward of these three slips, as water depths exceed 200 feet.

Propeller-induced currents would scour seabed sediments, but because of the steep bottom slope toward shore , most of the sediments would be transported into deep water by tidal currents and would not affect nearshore waters.. With time, the scour pattern would become more or less fixed in extent, just as the one at the present-day ferry terminal has over the years.

During major wind events, an area of confused seas from the interaction of reflected waves and wind waves would exist from the face of the breakwater to several hundred feet away, much like that which occurs off the floating bridges on Lake Washington. Small craft operators, including gillnet operators, would need to judge the risk to their operations depending on actual wave conditions and the sea-keeping aspects of their vessels. In gales (34-47 knots) and storms (48 knots and higher), wave conditions would be such that most small craft operators, including gillnetters, would likely seek shelter and choose not to operate in the open waters of Puget Sound.

Wind waves were analyzed in 10-degree directional increments, from 190°True to 230°True and 310°True to 030°True for sustained winds 15 knots and higher at the Modified Pt. Edwards Alternative site. These are the only directions that are important for wave generation at that site. Analysis for waves impacting the side of the floating breakwater for these directions indicate that the only reflected waves that might reach the entrance of the Edmonds Marina would be from incident waves approaching from 030°True, which actually encompasses directions 025°True to 034 °True. Significant wave heights of 2.0 to 4.0 feet only occur about 0.051 percent of the time from these directions, or about 4.5 hours in a year, on average. However, it would not be expected that hazardous clapotis wave action would occur at the marina entrance or waters directly offshore from the entrance, as the distance is over 1,200 feet from the floating breakwater. Clapotis waves for incident waves from 020°True (includes 015 °True to 024°True) strike the breakwater at a more oblique angle and would be confined to an area more than 450 feet southwest of the marina entrance. Incident waves from 310°True to 340°True are not important for clapotis formation because of their small angle of approach to the side of the floating breakwater. Incident waves from 190°True to 230°True (includes 185°True to 234°True) would be reflected toward offshore from the southwest face of the floating breakwater.

Ship wakes reflecting off the sides of the floating breakwater would likely not be a problem to most boaters or from a sediment erosion standpoint. Waves from ship wakes would still be in deep water when they reflect off the breakwater and not be heightened by shoaling effects, like what occurs along a beach. Wakes from ships and commercial tugboats mostly would be from rather distant sources, as these vessels usually operate in the Vessel Traffic Lanes well offshore.

Existing littoral drift patterns at Marina Beach should remain about the same. The floating breakwater at the Modified Point Edwards Alternative would be located

well outside the littoral drift zone and would not interrupt natural longshore littoral transport patterns by waves. No discernable changes in the existing pattern of beach changes during the course of a year would be expected because of the floating breakwater. Reflected waves from the side of the breakwater that might reach the beach would be limited to incident waves from the north-northwest that strike the breakwater at oblique, shallow angles. As a result, the reflected waves would be small and travel more or less in the same direction as the non-reflected waves. These reflected waves would not likely cause any noticeable changes in the existing sand transport along the beach. North-northwest wind storms are infrequent. Substantial long-term changes in the beach would not be expected, as the longshore littoral drift from frequent southerly waves would far exceed the effects from other wave directions and would restore any minor variations in the typical shape of the beach. Pile-supported structures would allow sediment transport between piles.

Vessel operators would contend with a more vigorous wind, wave, and current climate than at the Existing Ferry Terminal or the Mid-Waterfront site. The Modified Point Edwards Alternative site would be exposed to waves from 190 degrees to 030 degrees. (The Mid-Waterfront and existing ferry terminal are exposed to waves from about 230 degrees to 030 degrees.) Ferry operations are affected when significant wave heights are about 3.0 feet or higher. Percentage frequency of significant wave heights 3.0 feet and greater are shown in Table 4-5 for the three sites.

Table 4-5
Percentage Frequency of Significant Wave Heights 3.0 Feet and Greater

Site	190 to 220°True	230°True	310 to 030°True
Modified Point Edwards	2.01 percent	0.005 percent	0.30 percent
Mid-Waterfront	none	0.005 percent	0.30 percent
Existing ferry terminal	none	0.005 percent	0.30 percent

From 190°True to 230°Trues, the Point Edwards site would be expected to experience approximately 177 hours, on average, of significant waves 3 feet and higher in a year, compared to less than one-half hour at the other two sites. However, the floating breakwater would eliminate waves over 3 feet at the Point Edwards site from 190°True to 230 °True and, as a result, the incidence of high waves would be marginally less than at the other two sites. All three locations are exposed to waves 310 to 030 degrees; consequently, ferry operations at the Pt. Edwards site would be about the same as they are at the existing ferry terminal.

Navigation in strong winds from 190°True to 230°True would be expected to be easier at the Pt. Edwards site than at the existing ferry terminal because Slip 3 at Pt. Edwards would be oriented 190°True. An approaching ferry would be heading into the wind for winds from the south to southwest, with the wind nearly on the bow for southerly winds and on the forward starboard quarter for southwesterly winds. This would make the approach easier than at the existing Ferry Terminal where these winds are nearly broadside on the vessel.

The floating breakwater to be placed southwest of Slip 1 would likely interrupt the surface ebb tidal flow, resulting in weak ebb surface currents at all three ferry slips. During ebb tidal flow, the ferry would be heading into the current during approach with the current coming from the forward starboard quarter, which is acceptable from a navigational standpoint. During flood tidal flow, the current would be on the aft port quarter of the ferry, pushing the ferry at an angle to the slip. However, since flood currents are generally less than 1.1 knots or so, the adverse effects would not be expected to restrict navigation in or out of the slip.

Phase 1

The impacts of long-term operations of Phase 1 would include all of the same types of impacts described for full buildout. As with full buildout, site runoff would be discharged directly to Puget Sound thereby negating any potential hydrologic impacts on Edmonds Marsh or Willow Creek.

Like full buildout, suspended sediments would be transported offshore into deeper water. Because there would only be two ferry slips, the scour pattern likely to develop around the outer end of the ferry pier would be somewhat less extensive than under full buildout.

Alternative 3: Mid-Waterfront Site

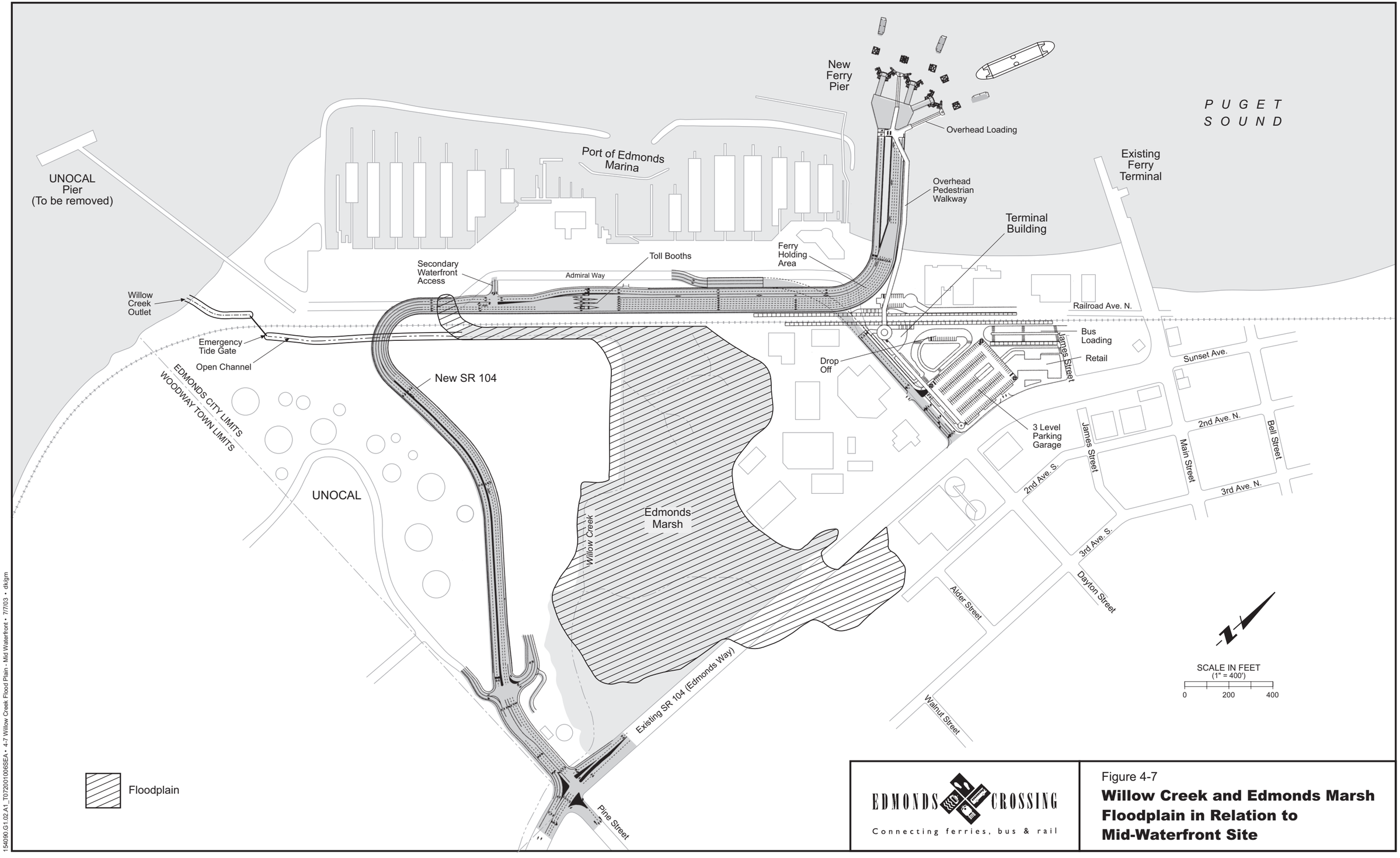
Full Buildout

As with Point Edwards, the Mid-Waterfront Alternative would slightly increase long-term peak rates and volumes of runoff from the existing UNOCAL property compared with the No Action Alternative. As with Point Edwards, runoff from project areas on the existing UNOCAL site would be discharged directly into Puget Sound via the existing Willow Creek culvert. Thus, there would be no adverse hydrologic impacts on Willow Creek or Edmonds Marsh associated with site runoff.

Under Alternative 3, Willow Creek would be daylighted from the BNSFRR to Puget Sound through Marina Beach Park in a manner similar to Point Edwards. As described for Point Edwards, the improvements to Willow Creek downstream of Edmonds Marsh would induce expansion of the salt marsh area within the marsh; they would also induce increased drainage of the marsh at low tide compared to existing conditions.

Almost all of the proposed multimodal terminal facilities and ferry holding and exit lanes north of the UNOCAL site under the Mid-Waterfront Alternative would be constructed in areas currently covered by impervious surfaces. Therefore, there would be minimal effects on stormwater runoff flow rates and volumes in those areas of the site. Existing drainage systems along Admiral Way and Dayton Avenue would not likely be adversely affected.

All development associated with this alternative would occur outside the 100-year floodplain for Willow Creek and the associated marsh area (see Figure 4-7). Thus, in accordance with Executive Order 11988 (Floodplain Management), the project



154090.G1.02.A1_T072001008SEA • 4-7 Willow Creek Flood Plain - Mid Waterfront • 7/7/03 • dk/gm

EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 4-7

Willow Creek and Edmonds Marsh Floodplain in Relation to Mid-Waterfront Site

would not result in any loss of floodplain storage and would minimize any flooding related impacts to human, natural, or cultural resources.

Propeller scour, shown in Figure 4-8, would be the largest impact from this alternative. Propeller scour would likely erode a region of eelgrass around the proposed pier, on a scale larger than that at the existing ferry pier because two slips would be used instead of one. (The effects of the proposed project on eelgrass are discussed in Section 4.9, Vegetation, Fish, and Wildlife.) Propeller current scour is not expected to erode sediments away from pilings supporting the existing fishing pier or from the Port of Edmonds Marina breakwater. Eelgrass in the vicinity of each slip would likely be scoured out, and a scour depression aligned with Slip 3 would likely form toward the north-northeast, because of depths less than 30 feet MLLW.

While a ferry is holding position at Slip 3, currents from a propeller turning 50 rpm could cause scour of sand approximately 3,200 feet behind the propeller. Suspended sediments of sand-sized and smaller particles could be transported additional distances by the action of tidal and wave-induced currents. Detailed circulation patterns are not known for the specific site. Some particles would likely move into deeper water, but the long-term depositional pattern is not known in regard to potential deposition in or near the marina entrance. The entrance to the marina would be approximately 850 feet from the nearest slip, and most larger particles would settle out of the water column before reaching the marina entrance. The pile-supported pier would allow waves and currents to pass through and would have minimal effect on littoral drift.

Phase 1

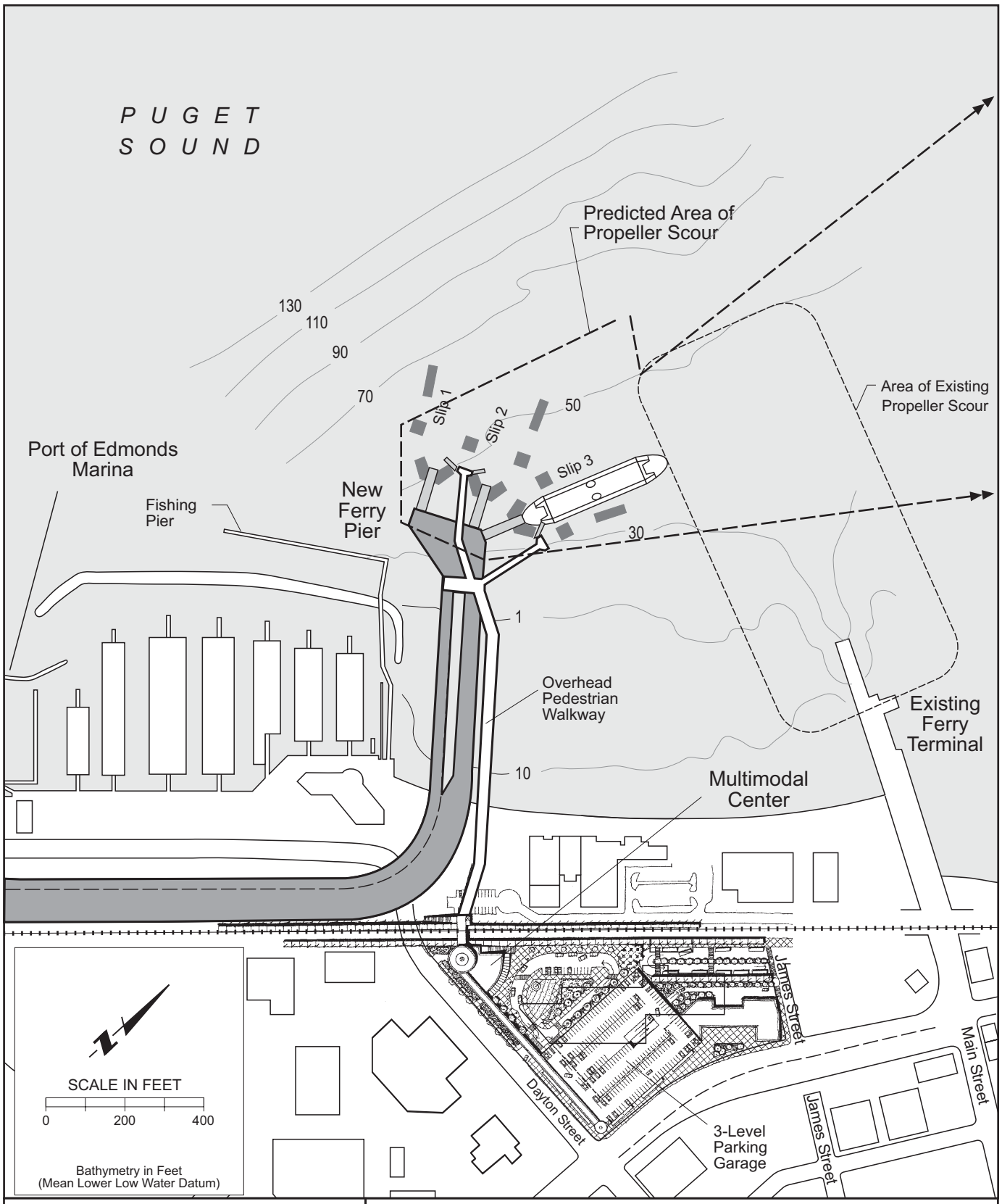
The impacts of long-term operation of Phase 1 on drainage systems would be similar to those under full buildout, but to a lesser extent because of smaller increases in impervious surface areas in the project vicinity.

The long-term operation impacts of Phase 1 facilities on offshore hydrology would be similar to, but less than, those described under full buildout because operations at only two slips (Slips 2 and 3) would create a somewhat smaller scour pattern. The propeller wash would have a lesser effect on sediments near the public fishing pier and existing breakwater because the ferries would be farther from these structures.

4.6.3 Mitigation Measures

Mitigation recommendations are not offered for the No Action Alternative because very little new development would occur in the project vicinity. Therefore, mitigation recommendations are offered only for the two build alternatives.

As currently planned, all site runoff under the Point Edwards Alternative would be conveyed directly to Puget Sound in the existing Willow Creek culvert, which would otherwise be abandoned once the new stream channel is constructed. Similarly, runoff from the portion of the Mid-Waterfront Alternative improvements located on the existing UNOCAL site would be discharged directly to Puget Sound



EDMONDS CROSSING

Connecting ferries, bus & rail

Figure 4-8

Predicted Area of Scour for Alternative 3: Mid-Waterfront Site

in the existing Willow Creek culvert. This would offset the potential adverse effects of increased peak flow rates on the lower reach of Willow Creek under either alternative.

The proposed modifications to the Willow Creek channel adjacent to and downstream of the BNSFRR would include bank stabilization features to withstand the erosive effects of peak flows generated in the Willow Creek basin and Shellabarger Creek. The channel would also provide greater flow conveyance capacity than the existing Willow Creek culvert. Hydraulic analyses would be conducted during the final design phase of the project to ensure that the proposed improvements would not adversely affect the conveyance capacity of local drainage systems. The design of the Willow Creek channel and associated new culverts could readily be modified to include a low weir, or a raised culvert elevation nearest the marsh outlet, to accomplish similar water impoundment at all times in the marsh as occurs in the existing condition, if that is desired by regulatory agencies involved in approving the modified stream design. However, allowing the marsh to drain freely during ebb tides, without impoundment of shallow water, would replicate natural salt marsh conditions that likely existed in the area prior to development of the waterfront and installation of the existing tide gate.

For the Mid-Waterfront Alternative, detention of runoff from the multimodal center adjacent to Dayton Street would not be necessary because there are no downstream concerns related to high flows. However, existing flooding problems on Dayton Street may be improved slightly by using a larger diameter storm drain in the pipe replacement section associated with railroad underpass construction. The existing 24-inch-diameter pipe could be replaced with a 36-inch-diameter, or larger, drain extending from the underpass (where existing pipe is abandoned or removed) to the outfall adjacent to the fishing pier.

For each build alternative, design of the project would seek to use porous paving materials where feasible to reduce the extent of runoff generated on the site (Booth *et al*, 2001; U.S. EPA 1999). This would in turn reduce stormwater treatment requirements and minimize potential hydrologic impacts downstream. The project should also seek to implement other low-impact development measures where feasible. For example, a green (vegetated) rooftop should be considered for the covered parking structure (full buildout), while runoff from the open parking facility in Phase 1 potentially could be routed to a bioretention system to help treat and detain stormwater. The overall site design should be reviewed to incorporate other low-impact development measures where applicable.

As the design progresses for the project, impervious surfaces, such as parking areas, buildings, and walkways, will be located as much as possible in areas where they will replace (or overlie) existing impervious surfaces or hard-packed gravel and earth. This will minimize the hydrologic changes that occur following development. This is particularly applicable to the UNOCAL site where the existing ground cover is a mix of pavement, gravel, and vegetation.

For the Point Edwards Alternative, an offshore floating breakwater would be required to reduce the height of waves from strong winds from the south quadrant. Such a breakwater would be designed to reduce wave heights by at least one-half,

which would require a smaller breakwater than if 100 percent reduction were attempted. Breakwaters to protect against north-quadrant storm waves would not be required because the site would be no more exposed than is the existing terminal to these waves.

For Mid-Waterfront, there is a small chance that scour protection may be required to protect the existing Port of Edmonds fishing pier from erosion. An inspection of the fishing pier pilings would be conducted during the final design phase to determine the possible need for protective armoring. If the need for armoring is marginal, once the proposed ferry terminal becomes operational the fishing pier would be monitored periodically for 1 year for potential effects from propeller scour. If such scour is found to be a more substantial problem, seabed armoring would be added to protect the structural integrity of the fishing pier pilings.

Loss of eelgrass under the Mid-Waterfront Alternative would be mitigated by infilling eroded seabed areas at the existing ferry terminal and allowing eelgrass to repopulate the area naturally.

4.7 Water Quality

4.7.1 Studies and Coordination

The following discussion is based on the water quality discipline report (CH2M HILL and Herrera Environmental Consultants, 1995), which is incorporated into this EIS by reference, and on subsequent analyses of regulatory requirements for stormwater management that would apply to the project.

Existing water quality conditions in the project vicinity were characterized through a review of available literature sources, field reconnaissance, and collection of water quality monitoring data. The project area was visually surveyed to map drainage features, identify plant communities, and assess existing water quality conditions. Water quality monitoring was conducted at three locations in Willow Creek in the project vicinity.

The analysis of water quality impacts associated with short-term construction activities was based on available information sources, including environmental assessments for similar projects, probable areas of construction site disturbance, and experience with development of stormwater management guidelines for local agencies. The analysis of long-term operational impacts on water quality was based primarily on development of pollutant loading estimates. The pollutant loadings expected from project development reflect the implementation of water quality treatment facilities required by applicable regulations of the City of Edmonds, and assuming that the equivalent of the current Washington State Department of Ecology requirements for stormwater treatment would be implemented by WSDOT and the City of Edmonds at the time of project permitting and construction.

Several agencies and organizations were contacted for information that could not be found in available literature sources; they are listed in Appendix A.

4.7.2 Impacts

The analysis of long-term operational impacts of the project alternatives is based primarily on estimates of average annual pollutant loadings in stormwater runoff from the project area. The project area incorporated in this analysis is much larger than the area physically affected by any of the individual alternatives. The selected area extends from the existing ferry terminal south to the southern edge of the UNOCAL site, and from SR 104 west to the Puget Sound shoreline. The larger area was used as the basis for the pollutant loading estimates because it is a land area that all of the alternatives share in common.

Table 4-6 lists the estimated pollutant loadings to Puget Sound from the project area, without accounting for runoff treatment that would be required under the build alternatives. Table 4-7 lists the estimated pollutant loadings to Puget Sound from the same geographic area in a typical year, with the required runoff treatment facilities in place. It was assumed for this analysis that the equivalent of "basic" treatment facilities, as outlined in the Washington State Department of Ecology Stormwater Management Manual for Western Washington (Ecology, 2001), would be used. Some assumptions and literature references incorporated into the pollutant loading estimates are shown as notes in Tables 4-6 and 4-7.

Table 4-6
Estimated Pollutant Loadings to Puget Sound from the Project Site, Without Treatment

	Open Space	Forest	Roads	Parking Lots	Commercial	Industrial	Total
No Action Alternative							
Area in Land Use (acres)	37	24	9	15	39	31	155
Pollutant	**Pollutant Loading (lb/year)**						
TSS	222	1,800	4,050	6,000	39,000	26,660	78,000
TP	2	2	9	11	59	40	123
TKN	56	62	22	77	261	118	595
Pb	0	0	6	12	105	74	199
Cu	1	1	0	1	16	16	34
TPH	0	0	405	1,680	410	3,472	6,000
Mid-Waterfront Site Alternative							
Area in Land Use (acres)	36.5	23	12.0	24	34.5	26.5	156.5
Pollutant	**Pollutant Loading (lb/year)**						
TSS	219	1,725	5,400	9,600	34,500	22,790	74,000
TP	2	2	12	17	52	34	119
TKN	55	60	29	122	231	101	598
Pb	0	0	8	19	93	64	185

Table 4-6
Estimated Pollutant Loadings to Puget Sound from the Project Site, Without Treatment

	Open Space	Forest	Roads	Parking Lots	Commercial	Industrial	Total
Cu	1	1	1	1	14	13	30
TPH	0	0	540	2,688	362	2,968	6,600
Point Edwards Site Alternative							
Area in Land Use (acres)	36	19	12.5	29	42	18	156.5
Pollutant	**Pollutant Loading (lb/year)**						
TSS	216	1,425	5,625	11,600	42,000	15,480	76,000
TP	2	2	13	20	63	23	123
TKN	54	49	30	148	281	68	631
Pb	0	0	9	23	113	43	189
Cu	1	1	1	1	17	9	29
TPH	0	0	563	3,248	441	2,016	6,300

Pollutant Loading Factors (pounds per acre per year):

Pollutant	Open Space	Forest	Roads	Parking Lots	Commercial	Industrial
TSS	6	75	450	400	1,000	860
TP	0.06	0.1	1.0	0.7	1.5	1.3
TKN	1.5	2.6	2.4	5.1	6.7	3.8
Pb	0.005	0.02	0.7	0.8	2.7	2.4
Cu	0.03	0.03	0.05	0.04	0.4	0.5
TPH	0	0	45	112	10.5	112

TSS Total suspended solids
Pb Lead
TP Total phosphorous
Cu Copper
TKN Total Kjeldahl nitrogen
TPH Total petroleum hydrocarbons References: Bellevue (1993); Horner et al. (1994); Horner and Mar (1982); Woodward-Clyde (1992)

Land use assumptions are as follows:
1. *Railroad and existing UNOCAL site are considered industrial land use.*
2. *Most of the ferry holding lanes are considered to be parking lots for pollutant loading analysis only.*
3. *Edmonds Marsh, stream corridors, and waterfront beaches and park areas are considered to be open space.*
4. *The Harbor Square development north of Edmonds Marsh is considered to be entirely commercial land use.*
5. *Most of the onshore area near the marina is considered to be parking lots.*
6. *Thick stands of trees on the existing UNOCAL site and surrounding Edmonds Marsh are considered to be forest.*
7. *Most of the site area that would be converted to a multimodal center and ferry access lanes under the Mid-Waterfront Alternative are considered to be commercial land use and/or No-Action Alternative.*

Source: Bellevue (1993); Horner et al. (1994); Horner and Mar (1982); Woodward-Clyde (1992)

Table 4-7
Estimated Pollutant Loadings to Puget Sound under the Development Alternatives, with Treatment

Mid-Waterfront Site Alternative

Pollutant	Removed Loadings (lb/year)			Total Loading Reduction	Net Pollutant Site Loading
	Wet Ponds[a]	Bioswale[b]	Sand Filter[c]		
TSS	1480	1536	2556	5,600	68,400
TP	1.4	1.0	2.4	4.8	114
TKN	7.1	3.7	13	23	575
Pb	2.6	2.5	4.9	10.0	175
Cu	0.1	0.1	0.15	0.30	30
TPH	262	403	309	970	5,630

Modified Point Edwards Site Alternative

Pollutant	Removed Loadings (lb/year)			Total Loading Reduction	Net Pollutant Site Loading
	Wet Ponds[d]	Bioswale	Sand Filter		
TSS	5,708	0	0	5,710	70,300
TP	5.3	0	0	5.3	118
TKN	28	0	0	28	603
Pb	10.2	0	0	10.2	179
Cu	0.26	0	0	0.26	29
TPH	1029	0	0	1030	5,300

Pollutant Removal Efficiencies of Assumed Stormwater Treatment Systems:

Pollutant	Wet Pond (percent)	Bioswale (percent)	Sand Filter (percent)
TSS	80	80	80
TP	40	30	40
TKN	35	15	35
Pb	75	65	80
Cu	35	45	45
TPH	60	75	40

[a]assumes 4.5 acres of road and parking lot surface drainage treated by a wet pond (UNOCAL site).
[b]assumes 4.8 acres of road and parking lot surface drainage treated by biofiltration swales.
[c]assumes 1.5 acres of roads and 6.3 acres of parking lot drainage treated by sand filters.
[d]assumes drainage from 3.5 acres of roads and 13.9 acres of ferry access lanes/parking lots treated by a wet pond

References U.S. EPA (1992); Metro (1994); Horner et al (1994); Schueler et al (1992); Ecology (2001).

Alternative 1: No Action

The No Action Alternative would result in slightly higher loadings of most of the pollutants analyzed, compared with the build alternatives, because most of the project site along the waterfront would be unaffected by the new development and runoff from almost all of the waterfront area is not (and would not be) treated prior

to discharge into Puget Sound. The No Action Alternative would also result in the highest concentrations of all pollutants analyzed in site runoff.

Although the dilution effects of Puget Sound certainly reduce the adverse impacts of contaminated runoff from the project area on the aquatic environment offshore, there is concern about contamination of near-shore sediments because most of the pollutant loading in urban runoff is in the form of particulates that can settle into sediments near outfalls. The continuing discharge of runoff contaminants under the No Action Alternative would result in ongoing degradation of the sediments near the stormwater outfalls, with associated impacts on benthic habitat.

Pollutant loading from roadway runoff on SR 104 north of Pine Street is expected to increase under the No Action Alternative as ferry traffic volumes increase over time. Traffic-related pollutants in this roadway runoff would enter Shellabarger Creek and Edmonds Marsh, causing increased water quality impacts. Ferry traffic frequently backs up on SR 104, with many vehicles parking on the shoulder for extended periods of time. Parked vehicles can deposit greater pollutant loads than moving vehicles, so the greater incidence of backed-up ferry traffic under the No Action Alternative would likely lead to greater pollutant deposition (per vehicle using the ferry) on SR 104.

Improvements to the existing ferry pier could cause operational impacts on water quality as a result of shading of the marine shoreline and changing sediment distribution patterns. Shading of intertidal and subtidal habitat along the shoreline could affect eelgrass and macroalgae beds, with associated impacts on dissolved oxygen levels as a result of reduced photosynthetic activity. Wave action and littoral drift could also be altered by the new pilings, thereby changing distribution patterns of sediments and contaminants that may be associated with them.

Propeller scour from ferry docking would continue to suspend fine-grained sediments on the bottom (see “Waterways and Hydrological Systems”). The turbidity from propeller scour could reduce water clarity and photosynthesis.

Of the three alternatives, the No Action Alternative would probably have the greatest impact on groundwater quality. Areas of soil that are currently contaminated on the existing UNOCAL property (but assumed to be cleaned to acceptable and appropriate standards prior to the initiation of the Edmonds Crossing project) would be partially paved over by new road and parking surfaces under the build alternatives, preventing percolation of runoff in some areas. If the existing porous surface coverage is retained under the No Action Alternative and the soil contamination is not completely remediated, percolation of contaminants into groundwater beneath the existing UNOCAL property would continue to occur.

At some point under the No Action Alternative, the UNOCAL property would be completely cleaned up. The site clean-up may take longer to accomplish without the impetus of the project to hasten the process. Eventually ongoing groundwater contamination would also cease under the No Action Alternative. When the soil clean-up is completed, the No Action Alternative would not have a better or worse impact on groundwater quality compared to the build alternatives.

Impacts Common to Both Build Alternatives

Full Buildout

Normal site operations would result in water quality impacts related primarily to contaminated stormwater runoff from ferry holding lanes, parking areas, and roads. Typical pollutants of concern in stormwater runoff from vehicle traffic areas include sediments, oil and grease, toxic organic compounds, heavy metals, nutrients, and oxygen-demanding substances. There is also potential for accidental spill impacts associated with ferry, rail, and bus traffic on the site. These impacts could occur with all the alternatives.

Accidental spills of commercial materials transported through the project area by rail is a concern, but these operations would occur independently of any of the project alternatives. Accidental spills associated with additional bus traffic in the project area under either of the development alternatives is a negligible concern, because bus fueling would not occur in the project area.

Groundwater quality in the site vicinity is not expected to be adversely affected by long-term operations, because most of the project area is covered or would be covered by impervious surfaces that prevent contaminants from entering the subsurface. Infiltration of stormwater runoff to underlying groundwater would not increase under any of the build alternatives. A stormwater treatment pond is proposed for either build alternative on the existing UNOCAL site, and it is expected that the pond would generally not transmit stormwater to the subsurface. If deemed necessary, the pond could be lined to prevent any incidental subsurface seepage.

Phasing

Generally, the first phase of development would involve less impervious area and less traffic in the new ferry terminal vicinity, and as such would likely result in the need for smaller stormwater treatment systems compared to those that would be provided for full buildout. Therefore, Phase 1 would not incorporate as much runoff treatment capability (none exists now) as full buildout. The estimated minor reductions in pollutant loadings to Puget Sound, compared to existing site conditions, would not be realized to the extent that would occur with full buildout.

Full buildout would include a two-story covered parking structure, whereas Phase 1 would include an uncovered surface parking lot. This uncovered lot would generate higher concentrations of petroleum products, metals, and sediments in runoff in comparison to the runoff from the roof of the finished parking structure at full buildout. Although stormwater from the uncovered parking lot could be treated to remove the majority of the pollutants in runoff, stormwater treatment systems are not 100 percent efficient. Therefore, the first phase of development would have slightly greater pollutant loads in runoff from parking areas as compared to full buildout. Whether at full buildout or at the Phase I level of completion, the site runoff water quality could be effectively mitigated to prevent adverse receiving water impacts, and, therefore, this subtle difference in pollutant loads would not be substantial. Periodic facility maintenance would likely include using a street

sweeper and performing regular maintenance of catch basins; materials collected would be disposed of in a safe, permitted facility.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

City of Edmonds regulations would require implementation of permanent water quality treatment (i.e., pollutant removal) facilities in newly developed areas of the site as well as in existing areas that are redeveloped. However, treated stormwater runoff from access roadways, ferry holding lanes, parking areas, rooftops, and the ferry pier during normal operations of the multimodal center would still carry sediments, metals, nutrients, and petroleum hydrocarbons to the marine shoreline because only partial pollutant removal can be accomplished.

The Point Edwards Alternative would reduce mass loadings of pollutants compared with the No Action Alternative and would generally result in comparable or slightly higher pollutant loadings from the site compared with the Mid-Waterfront Alternative (see Tables 4-6 and 4-7). This difference is attributable mostly to greater total areas of access roads, ferry holding and exiting lanes, and parking lots that could be provided under the Point Edwards Alternative. With creation of improved stormwater treatment capability, the water quality of discharges from the multimodal terminal site could potentially be improved over the quality of runoff from the existing UNOCAL property. None of the pollutant loading from the site access roadways, ferry holding lanes, and multimodal terminal parking areas would affect Edmonds Marsh or Willow Creek because the on-site runoff would be discharged directly to Puget Sound, bypassing these water bodies.

The Point Edwards Alternative would also reduce concentrations of pollutants in site runoff compared with the No Action Alternative because of slightly lower pollutant loadings and greater dilution resulting from greater runoff volumes on increased impervious surface area. However, because most of the project area would not experience any development changes, most of the waterfront area runoff would continue to exhibit existing pollutant concentrations.

Long-term operation impacts on surface water quality under this alternative would also potentially include shading of the Puget Sound shoreline that would reduce photosynthetic activity in the intertidal zone, propeller scour causing increased turbidity in nearshore areas of Puget Sound, and accidental spills of toxic materials. The footprint of the ferry pier over the Puget Sound shoreline would be 0.95 acres. This alternative would have the least effect on shading of nearshore habitat.

A new tide gate in the realigned and daylighted section of Willow Creek east of the BNSFRR tracks is proposed to prevent flooding of properties adjacent to Edmonds Marsh during extreme high tide events. Under normal conditions the tide gate would be open, allowing saline water from Puget Sound to flow in and out of the marsh. This would promote sustenance of saltwater marsh characteristics over the long term, considered to be a beneficial impact because it would restore natural salinity characteristics in Edmonds Marsh.

As with the No Action Alternative, propeller scour from the docking of ferries could suspend fine-grained sediments on the bottom. This effect could occur for several months following initial operation of the new terminal. It is also possible that propeller scour at the Point Edwards location would be less influential because wind, wave, and current action in this area may have resulted in the presence of larger-grained materials that are not as easily stirred into suspension.

Phase 1

While full buildout at Point Edwards would include an automatic people-mover system to transport pedestrians from the multimodal center to the ferry terminal, Phase 1 would include a two-ended shuttle bus in a dedicated lane to move people from the parking lot and bus drop-off area to the ferry. The lane used by the shuttle bus would eventually be open to vehicles queuing for the ferry at full buildout. It is expected that the shuttle bus would contribute less pollutant loading in pavement runoff than the vehicular traffic at full buildout. Therefore, runoff from this portion of the project area would have slightly better quality under Phase 1. Additionally, Phase 1 would entail smaller parking areas compared to full buildout. Because of this, Phase 1 would result in less pollutant loading to Puget Sound associated with parked vehicles.

Alternative 3: Mid-Waterfront Site

Full Buildout

As with the Point Edwards Alternative, stormwater treatment facilities would be required for drainage from newly developed and redeveloped areas of the site. The net loadings to Puget Sound under this alternative would be slightly lower compared to loadings under the No Action Alternative, and generally slightly lower compared to loadings under the Point Edwards Alternative.

The Mid-Waterfront Alternative would have slightly fewer water quality impacts on Puget Sound compared with the Point Edwards Alternative. Direct discharge of (treated) runoff to Puget Sound from the access roadway and ferry holding lanes on the existing UNOCAL property would avoid water quality impacts on Willow Creek. Project site runoff entering Edmonds Marsh via tidal backwater would likely have slightly improved water quality compared to existing conditions due to more efficient stormwater treatment facilities on the existing UNOCAL site. The stormwater outfall to Puget Sound west of Dayton Street would discharge higher pollutant loadings under this alternative compared to the Point Edwards Alternative because of the presence of the multimodal center parking area near that outfall.

As with the Point Edwards Alternative, the Mid-Waterfront Alternative would have reduced concentrations of pollutants in runoff compared to the No Action Alternative. However, Mid-Waterfront would result in slightly higher average pollutant concentrations in runoff entering Puget Sound compared to Point Edwards (due to fewer stormwater dilution effects). Because most of the project area would not experience any development changes, most of the runoff contamination would be attributable to existing development along the waterfront rather than to the new multimodal center.

Long-term operational impacts on surface water quality under the Mid-Waterfront Alternative would be similar to impacts under Point Edwards. The potential for adverse water quality impacts as a result of propeller scour from the docking of ferries and accidental spills during normal maintenance of ferries would be essentially the same as under Point Edwards, because the anticipated level of ferry traffic would be the same for each build alternative. However, adverse impacts from shading of near-shore habitat would be greater under this alternative compared with the other two alternatives. The ferry pier at the Mid-Waterfront location would affect eelgrass and macroalgae beds to a greater extent than would the existing ferry pier location nearby. The Mid-Waterfront Alternative would require a larger pier footprint over the intertidal shoreline compared to Point Edwards, and this location also has a larger area of eelgrass and macroalgae beds than does the Point Edwards location. Therefore, there is greater potential for shading of valuable habitat and associated reduction of photosynthesis (i.e., dissolved oxygen) under the Mid-Waterfront Alternative.

Phase 1

Long-term impacts of Phase 1 would be similar to those of full buildout, but the magnitude of some impacts would be reduced. The discussion of Phase 1 impacts under Point Edwards applies to this alternative as well.

4.7.3 Mitigation Measures

The multimodal terminal facilities under each build alternative would require permanent stormwater treatment facilities to reduce the impacts of stormwater runoff on the water quality of Puget Sound. Thus, the build alternatives would incorporate water quality mitigation measures as part of the plans. Figures 4-9 and 4-10 illustrate the site areas that would drain to stormwater treatment facilities under the Point Edwards and Mid-Waterfront Alternatives, respectively. These areas correspond to all of the pollution-generating impervious surfaces within the project limits as affected by project construction. It is anticipated that the stormwater treatment requirements presented in the *Stormwater Management Manual for Western Washington* (Ecology, 2001), or functionally equivalent requirements developed by the City of Edmonds and WSDOT, would apply to the design of temporary and permanent drainage systems under the build alternatives. As discussed previously, the water quality of outflows from the required stormwater treatment facilities would generally be similar or slightly improved compared to existing conditions. In addition, design of the project should seek to incorporate low-impact development measures wherever feasible (e.g., bioretention systems. “green” rooftops, and porous pavement) to help treat stormwater runoff and reduce the incidence of runoff. Uncovered parking could be designed so that the traveled lane is at a higher grade, sloping down to parking areas that drain to bioretention systems.

SMA 10
SMA 9
Salmon Management Area Boundary (SMA)
Breakwater
New Ferry Pier
Overhead Pedestrian Walkway
UNOCAL Pier (to be removed)
Port of Edmonds Marina
Existing Overhead Pedestrian Walkway (would be relocated)
Existing Ferry Terminal (shaded portion to be removed)
PUGET SOUND
Turnaround
Daylighted Section of Willow Creek (Lined Channel)
Admiral Way
Bus Stops
Terminal Building
Drop Off
Railroad Platform
Covered Pedestrian Walkway
Bus Loading Area
Railroad Ave.
Willow Creek Outlet
Emergency Tide Gate
Open Channel
Stairs and Elevator
Ferry Holding Area
Short-Term Parking
EDMONDS CITY LIMITS
WOODWAY TOWN LIMITS
Stormwater Treatment Pond
Salt Marsh
Garage Entrance (below)
2-Level Parking Garage
Employee Parking Stalls
Toll Booths/2nd Story Employee Facilities Safe Room/ Agent Accounting Room
Willow Creek
Edmonds Marsh
Terminal Access Road
Existing SR 104 (Edmonds Way)
Freshwater Wetlands
Deer Creek Hatchery
Sunset Ave. N.
2nd Ave. N.
James Street
Main Street
Bell Street
2nd Ave. S.
3rd Ave. N.
3rd Ave. S.
Alder Street
Dayton Street
SCALE IN FEET
(1" = 400')
0
200
400

LEGEND

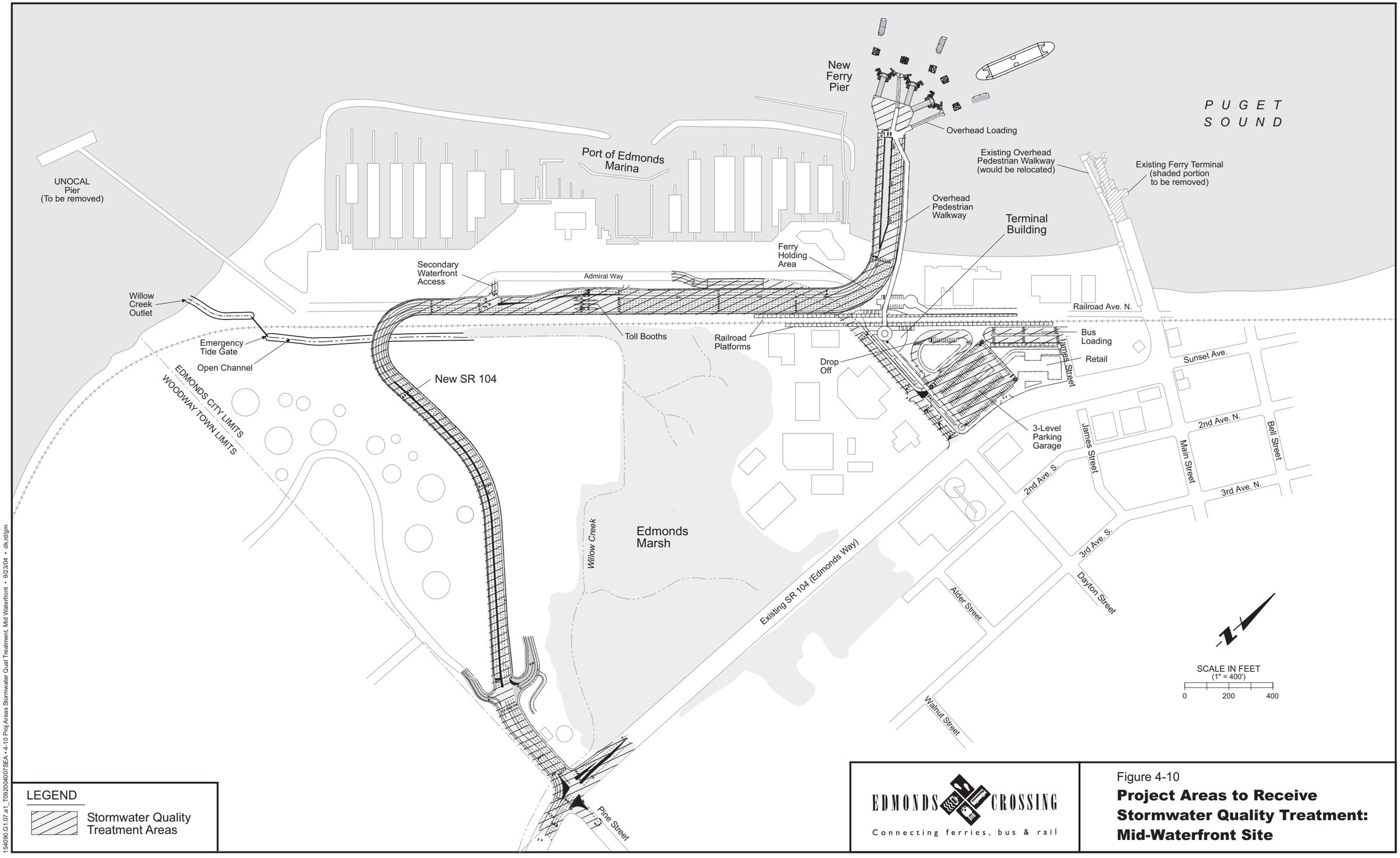
Stormwater Quality Treatment Areas

EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 4-9

Project Areas to Receive Stormwater Quality Treatment: Point Edwards Site

154090.G1.07.A1_T092004007SEA • 4-9 Proj Areas Stormwater Qual Treatment- Pt. Edwards • 9/23/04 • dk.gm



EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 4-10

Project Areas to Receive Stormwater Quality Treatment: Mid-Waterfront Site

154090.G1.07.a1_T092004007SEA • 4-10 Proj Areas Stormwater Qual Treatment, Mid Waterfront • 9/23/04 • dk.rd/gm

As discussed in Appendix E, a constructed stormwater treatment pond would likely be used to improve the quality of almost all of the stormwater runoff from the multimodal terminal area under the Point Edwards Alternative. This pond might be configured to function more like a shallow wetland system than a deep settling pond. If the Mid-Waterfront Alternative were developed, a similar, though smaller, treatment facility would probably be provided in the same general location (on what is currently the UNOCAL lower yard). Treatment of runoff from the ferry piers under the Point Edwards Alternative may occur in the same pond, or with one or more separate treatment systems designed in accordance with applicable regulatory requirements at the time of construction. Alternatively, in-kind treatment of runoff could be accomplished with collection of runoff from a nearby roadway with similar traffic patterns (such as a portion of SR 104). Whatever option is implemented, the design would satisfy the intent of the applicable Ecology treatment requirements (and comparable requirements set forth by WSDOT and the City of Edmonds) at the time of permitting and construction. To help offset potential impacts related to high temperature water in the treatment pond discharges, shade trees should be established on the periphery of the constructed stormwater treatment pond system.

Space is limited for installation of typical stormwater treatment systems, such as biofiltration swales and sand filter trenches, adjacent to the new ferry pier, along Admiral Way, and in the area of the multimodal center under the Mid-Waterfront Alternative. Thus, it is likely that stormwater treatment facilities would be provided in a combination of underground systems, such as filtration systems or wet vaults. Alternatively, in-kind treatment of runoff could be accomplished in a nearby area with sufficient aboveground space via collection of runoff from a nearby roadway with similar traffic patterns (such as a portion of SR 104 and/or Dayton Street). All of the stormwater treatment facilities provided for the Mid-Waterfront Alternative would comply with the intent of the applicable Ecology requirements (and comparable requirements set forth by WSDOT and the City of Edmonds) at the time of permitting and construction.

The existing ferry terminal under the No Action Alternative and the new ferry terminal under either of the build alternatives would require a NPDES permit for refueling the dock bull (i.e., equipment used to pull stalled cars off the ferries) and development of a stormwater pollution prevention plan. Compliance with the NPDES permit and associated requirements would ensure that inspection and maintenance schedules and good housekeeping practices are used at the ferry terminal. These measures would prevent pollutants from entering Puget Sound through stormwater runoff, avoiding water quality impacts.

Increased nonpoint source pollution associated with increased access and usage of the waterfront area requires mitigation. Long-term operations of the multimodal terminal facilities must place emphasis on pollution prevention. Pollutant source control measures (BMPs) that would minimize the adverse effects of normal site operations on receiving water quality are listed below. For these pollutant source control measures to be truly effective, funding would need to be committed to a long-term operations and maintenance program:

- Prepare a spill prevention, response, and containment plan for the multimodal terminal. This plan would include training for on-site personnel and provisions for maintaining spill clean-up kits at the facility.

- Following application of traction and deicing materials, sweep all affected areas clean as soon as it is safe to do so. This practice would reduce the amount of solids carried into the storm drainage system during wet seasons, when higher runoff flows could quickly flush solids and adsorbed pollutants through the on-site stormwater management facilities and into Puget Sound.

- Inspect all of the on-site stormwater treatment facilities in accordance with Ecology guidelines to ensure that they continue to function as intended. Easy maintenance access and maneuverability are critical to the design and use of these facilities. Of particular importance are removal of debris in treatment pond/outflow structures, maintenance of healthy vegetation in aboveground treatment systems, and removal of accumulated sediments in treatment systems as necessary to prevent subsequent flushing of those sediments during turbulent storm flow conditions.

- Clean out underground catch basins frequently. Sediments in the sumps of catch basins would be removed when the depth of accumulation reaches a threshold specified under current Ecology guidelines, to prevent accumulations of sediments and adsorbed contaminants from being flushed downstream in the conveyance system during high-flow events. Sediments that are removed from treatment systems would be handled and disposed of according to applicable local regulations. (Note: WSF currently uses a private contractor for catch basin maintenance at all of its terminals. The contract would apply to ferry terminal improvements under this project.)

- Sweep parking areas and material storage areas with a high-efficiency or regenerative-air sweeper at least twice per month in the wet season and at least once per month in the dry season to collect and dispose of waste materials and grit.

- Post signs to remind ferry passengers to avoid littering and to avoid performing vehicle maintenance work in multimodal center areas.

- Develop and implement additional BMPs once the multimodal facilities are operating. The types of additional BMPs should be derived from a collaborative effort amongst operations and maintenance personnel with intimate knowledge of the facilities and potential pollution problems.

4.8 Wetlands

4.8.1 Studies and Coordination

The following discussion is based on the wetlands discipline report (CH2M HILL and Adolfson and Associates, 1995), which is incorporated into this EIS by

reference, and on subsequent analysis to reflect revisions to the design of the project.

Study Methodology

The methodology included several levels of investigation of wetlands within the project area: a review of existing information, discussions with individuals knowledgeable about wetlands within the project area, field investigations, and wetland characterizations. A wetland delineation was performed under separate contract within the project area at the existing UNOCAL property (Adolfson Associates, 1995).

On-Site Investigation

Field reconnaissance visits were conducted on May 4, May 23, and June 15, 1995, and June 24, 1996, to gather information on the location and extent of wetlands in the project area. Data obtained from the reconnaissance was used to evaluate wetland functions and values, determine wetland ratings, evaluate potential impacts, and determine mitigation measures. Wetland boundaries on or adjacent to the UNOCAL site were flagged in the field. With the exception of the wetlands on the existing UNOCAL property, wetland boundaries were not formally delineated but were approximated using aerial photographs. It is anticipated that wetland delineations would be conducted within the preferred alternative project area during later phases of the project, using the methodologies recommended by the City of Edmonds and the Corps, and confirmed by the Corps.

Wetland delineations were conducted on the existing UNOCAL property on January 20, and 24, 1995, as part of a separate project (Adolfson Associates, 1995). Information from these delineations was incorporated into the data for the project site. The wetland delineations were conducted according to methods recommended in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* ("1989 Manual") (Federal Interagency Committee for Wetland Delineation, 1989) and the *Corps of Engineers Wetlands Delineation Manual* ("1987 Manual") (Environmental Laboratory, 1987). Because the wetland falls under the jurisdiction of both the City of Edmonds and the Corps, both manuals were used. The 1989 Manual was the method required by the City of Edmonds in 1995, and the 1987 Manual is required by the Corps. Current regulations require delineations performed in the State of Washington to use methodology from the *Washington State Wetlands Identification and Delineator Manual* (Ecology, 1997). That manual is consistent with the Corps manual. The results of the delineation on the existing UNOCAL property were found to be the same under both methods. The "routine on-site determination method" was used to determine wetland boundaries. The routine method is used for areas equal to or less than 5 acres in size, or for larger areas with relatively homogeneous vegetative, soil, and hydrologic properties.

Wetland Functional Values and Rating

Wetlands play important roles that provide valuable benefits to the environment and society. Wetland functions are the physical, chemical, and biological characteristics of a wetland, and include water quality improvement, storm and flood water control,

natural groundwater recharge, hydrologic support (streamflow maintenance), shoreline protection, and biological support. Wetland values are those characteristics that are viewed as beneficial to society, and include educational opportunities and recreational uses. Detailed scientific knowledge of wetland functions, sometimes known as functional values, is limited, so that evaluations of the functions of individual wetlands are necessarily qualitative and dependent on professional judgment.

A method developed by the Corps (Reppert, *et al*., 1979) was the primary basis for evaluating the wetlands within the project area for the following wetland functions: water quality improvement; storm and flood flow attenuation and storage; hydrologic support; and natural biological support. Additional wetland values (for example, aesthetics and recreational and educational opportunities) were used as secondary criteria.

In addition to functional assessment, wetlands within the project area were rated according to the wetland rating system in the City of Edmonds Critical Areas Ordinance No. 2874 (City of Edmonds, 1992). Wetlands are rated by the City according to their relative kinds and degrees of functions and values, their uniqueness, and their habitat potential for threatened or endangered plants and animal species.

Coordination with Agencies and Other Groups

During preparation of this study, coordination was initiated with several regulatory agencies (listed in Appendix A).

4.8.2 Impacts

A comparison of impacts on wetland systems resulting from each alternative is presented in Table 4-8. (Although the wetland boundary of the Edmonds Marsh has not been fully delineated, area of impact was calculated assuming that the wetland extends west to the base of the berm that underlies the BNSFRR track.).

Alternative 1: No Action

The No Action Alternative assumes that the ferry terminal would be maintained at its existing Main Street location. SR 104 would remain in its current location and configuration. SR 104 would continue to act as a barrier between the Edmonds Marsh and the smaller marsh to the east of the roadway. This separation serves to limit wildlife movement between these wetland habitats and to restrict hydrologic continuity between the two wetland areas. Higher volumes of car and truck traffic would result in an incremental increase in transportation-related pollutants (i.e., oil and grease, metals, particulates), some of which would be introduced to the marsh through airborne and surface water runoff pathways.

Table 4-8
Comparison of Impacts on Wetland and Riparian Systems

Impacts	Alternative 1: No Action	Modified Alternative 2 (Preferred Alternative: Point Edwards Site	Alternative 3: Mid-Waterfront Site
Wetlands buffers	No direct loss	0.2 acre	0.3 acre
Wetlands	No direct loss	0.06 acre[a]	0.36 acre (drainage channel) [a]
Riparian corridors	No direct loss	800 square feet (Willow Creek)	800 square feet (Willow Creek)
Erosion and sedimentation	No impacts on natural drainage systems during construction of the facility or roadways; no potential for improvement of surface water runoff	Smallest potential impacts on natural drainage systems during construction; potential for substantial decrease in sedimentation rates due to short and long term erosion control measures required by the project	Highest potential impacts on natural drainage systems during construction; potential for substantial decrease in sedimentation rates due to short and long term erosion control measures required by the project
Water quality	Highest long-term concentrations of all pollutants analyzed in site runoff; no proposed stormwater treatment facilities	Long-term reduced pollutant loadings compared to the other two alternatives, due to reducing pollutant loading through surface water quality treatment under proposed project	Long-term pollutant loadings lower than Alternative 1 but higher than Modified Alternative 2; higher potential for improvement of water quality of Edmonds Marsh because of less development at existing UNOCAL property

[a]This area does not include the area of the existing detention pond, which will be further modified for stormwater detention. The Corps has stated that a permit will not be necessary for changes to this stormwater pond; the City of Edmonds may regulate the stormwater pond as a Category 3 Wetland.

Impacts Common to Both Build Alternatives

Full Buildout

Over the long term, there would be the potential for alteration of wetland hydrology. The addition/alteration of impervious surfaces and changes in stormwater controls could change the amount of surface water input and sedimentation to the wetlands. Reduction and/or relocation of surface water inputs would have the potential for changing functions and values within wetland areas; for example, a reduction in surface water could shift the vegetative balance in favor of aggressive, invasive species, which are more tolerant of disturbed conditions. Alteration of saltwater input to Edmonds Marsh (i.e., volume, location, season), as a result of daylighting the creek, could change species composition within the marsh. As an example, closure of the tide gate resulted in a near-monotypic stand of cattails within the marsh during the period from 1962 to 1989, as a result of a predominance of fresh water in the marsh. Increased sedimentation in the marsh could smother aquatic plants, raise water levels, and change flow patterns.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

Should detention pond 1 on the existing UNOCAL property be reconfigured to provide on-site detention for the multimodal center, an opportunity would exist to provide effective erosion and sedimentation control, as well as to improve the quality of surface water runoff entering the marsh and lower Willow Creek. Removing contaminated soils and invasive, non-native species, and planting the new basin with native species would also improve the quality of habitat in the pond over existing conditions. According to a letter received from the ACOE (Mueller, pers. comm., 1995), impacts to the detention pond would not require a Section 404 permit as long as the pond is used for detention. Impact to the detention pond, however, might be regulated by the City of Edmonds.

The proposed design for the preferred alternative does not incorporate water level control in the marsh, except under emergency conditions. During conditions of extremely high tides coupled with a strong storm surge, City staff may manually close a tide gate to prevent the marsh water level from overtopping the existing levee on the north side of the marsh, as described in Section 4.7, Water Quality. Such an event might occur on the order of once every 1 to 3 years and for several hours per event. However, this temporary alteration is unlikely to affect the long-term stability of this brackish marsh community. During all other times, the Willow Creek culverts and channel between Edmonds Marsh and Puget Sound would be completely open to tidal surge and freshwater outflow. Periodic operation of the tide gate would not alter the ecological functions of the salt marsh or perimeter freshwater marsh, as the hydraulic control would be so brief and so infrequent. Since the flow capacity of the new culverts and new open channel would be much greater (less restrictive) than the current conditions, a greater amount of saltwater would enter the marsh in flood tides and ebb out of the marsh on a daily basis. As a result, the size of the salt marsh area is expected to increase. The spatial extent of saltmarsh expansion is unknown, however, as it has not been modeled.

The project could result in lower marsh water levels at times of low tides relative to existing conditions because the new Willow Creek culverts and open channel would drain the marsh more effectively. The existing culvert nearest the outlet of the marsh has an invert elevation that lies above the outlet channel bottom, and therefore impounds water to a shallow depth upstream of it. That impoundment causes shallow water ponding in much of the marsh. Much of the marsh lies at an elevation of +8 to +9 feet MLLW. Salt marshes throughout Puget Sound typically do not retain water at low tide in this upper intertidal elevation range. The current design plan for the Willow Creek channel and the new culverts within it downstream of the marsh does not include raised culvert invert elevations, or a weir, to impound shallow water in the marsh. The design could readily be modified, however, to include a lower weir, or a raised culvert elevation nearest the marsh outlet to accomplish similar water impoundment at all times in the marsh as occurs in the existing condition.

Daylighting Willow Creek from the ditch and culvert that currently conveys the creek between the UNOCAL facility and the shore of Puget Sound would result in

0.06 acre impact to emergent wetland. However, it would also result in a net gain of 0.57 acre of emergent wetland, increasing habitat for wildlife such as great blue heron and other wading birds, mammals, fish, and waterfowl.

Phase 1

Phase 1 would result in the same impacts on the Edmonds Marsh estuarine habitat, Willow Creek riparian corridor at the Pine Street overcrossing and west of the UNOCAL site, and the Edmonds Marsh buffer as would full buildout.

Alternative 3: Mid-Waterfront Site

Full Buildout

Impacts under full buildout were discussed under "Impacts Common to Both Build Alternatives." A 0.36-acre wetland impact would occur associated with a new railroad spur.

Phase 1

Phase 1 would result in the same impacts to the Willow Creek riparian corridor as under full buildout. No other impacts to wetlands would be anticipated during this phase.

4.8.3 Wetland Finding

The following describes the wetland finding for the three alternatives addressed in the Final EIS.

A. Alternative 1 (No Action) would not require placement of fill in wetlands. Modified Alternative 2 would provide a practicable build alternative with limited wetland impacts—0.06 acre associated with daylighting Willow Creek. Impact to detention pond might, in addition, be regulated by the City of Edmonds.

   Alternative 3 (Mid-Waterfront Site) would require the placement of approximately 0.3 acre of fill in the drainage channel portion of the Edmonds Marsh. There are no practicable alternatives under this alternative to crossing the drainage channel. Impact to detention pond might, in addition, be regulated by the City of Edmonds.

B. The proposed build alternatives (Alternatives 2 and 3) include all practicable measures to minimize harm to wetlands. The Modified Alternative 2 was designed to minimize direct impacts to the Edmonds Marsh through elimination of the dedicated bus lane located along the west side of the wetland. Alternative 3 was designed to cross the drainage channel at its narrowest point, therefore minimizing the disturbed wetland area.

   Alternatives 2 and 3 have been designed to minimize potential direct and indirect impacts to the marsh from erosion and sedimentation through design of both temporary and long-term stormwater and water quality treatment systems. These

measures would potentially result in short-term and long-term reduction in sediment and pollutant load due to improved treatment of stormwater prior to release into the drainage channel.

Mitigation for impacts to wetlands under Alternatives 2 and 3 is possible within the project vicinity.

C. Based upon these considerations, it is determined that:

   – The proposed action includes all practicable measures to minimize harm to wetlands that result from Modified Alternative 2.

4.8.4 Mitigation Measures

Impacts to wetlands and buffers have been avoided where possible and minimized through the design process using Ecology's sequencing procedures. Future opportunities to minimize impacts will be explored during final design. Where impacts are unavoidable, WSDOT will use the following mitigation measures:

- Delineate all wetland boundaries within the project area, and have the boundary verified by the Corps.
- Prepare a final mitigation plan during the Corps Section 404 permitting process for impacts to wetlands. The final mitigation plan will include landscape drawings, plant specifications, and a monitoring and maintenance plan.
- Enhance the disturbed/fill area to the east of detention pond 1 by excavating the fill material, removing exotic species, and planting with native wetland species to provide additional wetland and wetland buffer area.
- Enhance the disturbed/fill area to the east of detention pond 1 by excavating the fill material, removing exotic species, and planting with native wetland species to provide additional wetland and wetland buffer area.
- Enhance wetland and stream buffer vegetation along Edmonds Marsh, the drainage channel, and the daylighted portion of Willow Creek by planting desirable native species, removing non-native invasive species, and replacing snags and large woody debris. These measures would enhance wildlife habitat and the water quality improvement and sediment trapping functions of the wetland and buffer area.

4.9 Vegetation, Fish, and Wildlife

4.9.1 Studies and Coordination

The following discussion is based on the vegetation, fish, and wildlife discipline report (CH2M HILL and Adolfson, 1995), which is incorporated into this EIS by reference, and on subsequent analysis to reflect revisions to the design of the project.

Study Methodology

The methodology included review of existing literature, library searches, database queries, field observations, and discussions with individuals knowledgeable about vegetation, fisheries, and wildlife in the project vicinity.

Field observations of vegetation and wildlife throughout the project vicinity were made on eight days from mid-May through June 1995 (May 17 and 30; June 1, 8, 12, 15, 22, and 27, 1995) and on June 24, 1996, August 20, 1998, January 25, 2001, and February 12, 2003.

Three site visits were conducted to analyze fisheries resources; the first, in December 1994, was a short reconnaissance of the Willow Creek mouth and the existing UNOCAL pier area, the Deer Creek Fish Hatchery, and Willow Creek upstream of the hatchery. The second visit, in June 1995, included a visit to City Hall to examine documents and a literature search at the Edmonds public library. The third visit, also in June 1995, was a habitat inventory survey of the intertidal area near the existing UNOCAL pier and a reconnaissance-level habitat survey of Willow and Shellabarger Creeks. Willow Creek was walked from the mouth to a point about 1/4-mile upstream of the hatchery. Shellabarger Creek was walked from the marsh, upstream, to a point of total blockage at the 5th Street culvert.

The stream habitat survey was descriptive rather than quantitative. Methods were discussed and agreed to in advance with the WDFW area-habitat biologist. Photographs were taken every 100 feet or less along the streams, depending on habitat diversity. Notes were taken regarding key elements of fish habitat. Features evaluated included the following:

- Stream bottom materials (substrate)
- Channel morphology (pools, riffles, runs, etc.)
- Extent of tidal influence
- Gradient
- Aquatic insect abundance
- Placement, size, and condition of culverts
- Passage problems
- Water temperature, clarity
- Streamside vegetation
- Canopy coverage (shade)
- Large woody debris
- Flow rate
- Channel confinement
- Factors that may be degrading habitat
- Fish species present
- Other factors considered important

Biological surveys of the marine environment were conducted September through December 1994. The project area was divided into two survey areas (north and south) corresponding to the Mid-Waterfront and Point Edwards sites, respectively. The following were the various survey components and their dates of occurrence:

- Vegetation mapping — September 14–16, 1994
- General ground truthing — September 30
- Eelgrass density delineation — October 3 and 10
- Geoduck survey — October 3
- Dungeness crabs (juveniles) — October 11–13
- Dungeness crabs (egg-bearing females) — December 27
- Hardshell clams — October 11–13

Marine surveys for macroalgae, eelgrass, and geoduck clams were conducted using WDFW guidelines. Eelgrass and macroalgae beds were mapped within the window of June 1 to October 1, as prescribed by WDFW. Eelgrass densities were measured outside this window, but were considered valid because of unusual weather conditions prior to the survey. Planned survey dates were approved by WDFW (Carman, pers. comm., 1994.). Geoduck surveys were conducted within the prescribed window of March 15 to October 15.

All surveys were visual observations made along representative transects. Intertidal surveys were conducted on foot, while subtidal surveys were conducted by self-contained underwater breathing apparatus (SCUBA)-equipped surveyors using remote cameras. In the case of macroalgae, eelgrass, and substrate surveys, transects were spaced about 40 feet apart and were conducted using a remote underwater camera towed below a boat. Eelgrass density and crab and clam transects along which quadrant counts were made ranged from one to four per project area, extending from intertidal to shallow subtidal depths.

Coordination with Agencies and Other Groups

The vegetation and wildlife evaluation involved conversations with agency personnel (WDFW, DNR, USFWS), individuals with conservation groups (Brackett's Landing Foundation, Audubon Society), and private individuals recognized as regional and local experts on botany and wildlife. A list of contacts is included in Appendix A. Letters were written to the USFWS and NOAA Fisheries regarding endangered species. They responded with lists of threatened, endangered, and candidate species likely to be found in the vicinity (included in Appendix A). Discussions took place with WDFW regarding the level of effort and methodologies to be employed on marine and freshwater fish habitat surveys. A series of meetings and discussions was held regarding the methodologies to be employed for delineating marine biota.

4.9.2 Impacts

Alternative 1: No Action

Vegetation

Over the long term, increasing volumes of vehicular traffic would result in an incremental increase in transportation-related contaminants (i.e., oil and grease, metals, particulates), some of which would be introduced to adjacent wetlands via airborne and surface water runoff pathways. SR 104 would continue to restrict hydrologic continuity between wetlands on either side of the highway.

Fisheries

Marine Environment

Under the No Action Alternative, the present ferry terminal would remain where it is now.

Impacts to benthos, eelgrass, and macroalgae beds occurred when the terminal was built 50 years ago. The approach to the pier was dredged to a depth of about 40 feet. Propeller wash-caused scour eliminated a much larger footprint of eelgrass and macroalgae beds, in addition to the dredged beds. This is graphically illustrated by the shape of the existing beds (Figure 3-12). Eelgrass loss was estimated to be approximately 112,033 square feet or 2.6 acres from shading, scour, and dredging. Macroalgae losses from these same factors was estimated to be approximately 165,020 square feet or 3.8 acres. Together, this represents about 6.4 acres of historical eelgrass and macroalgae loss at the existing Edmonds ferry terminal. The substrate composition in the scour trough was described as rocky, incised in till, and supporting a community of fish and invertebrates characteristic of rocky environments. The bottom characteristics prior to the building of the terminal was almost certainly fine to medium sand as it is on either side of the terminal today. It is likewise almost certain that the eelgrass beds to the north and south of the existing terminal were a continuous bed. Based on the extent of scour that has already occurred in the vicinity of the existing terminal, it is not considered likely that additional scour would occur under the No Action Alternative. Even with the anticipated use of larger ferry vessels, no additional scour-related impacts are expected because, while larger, the new generation of ferries is not anticipated to have greater propeller action. Potential impacts to migrating juvenile salmonids would be similar to, but possibly more than, the preferred alternative depending on whether the proposed pier design at Point Edwards is successful in passing juvenile salmonids under the pier.

Freshwater Environment

The No Action Alternative would have no effect on freshwater fish resources.

Wildlife

No new impacts on wildlife are anticipated with the No Action Alternative. SR 104 would continue to serve as a barrier to movement of wildlife utilizing wetland areas on either side of the highway.

Impacts Common to Both Build Alternatives

Full Buildout

Vegetation

Impacts to vegetation associated with this project would be primarily related to vegetation removal. The amount of impact associated with vegetation removal is tied to the loss of specific habitats and use by wildlife. While conversion of urban

habitat from one use to another does not substantially affect either vegetation or wildlife, loss of upland forest or emergent marsh, for example, could be important because of the scarcity of comparable habitat within the area.

Disturbance of the soil surface would also provide an opportunity for the introduction of non-native invasive species. These species are opportunistic and often fill habitat niches formerly filled by native species. Disturbed areas in the Puget Sound region are often colonized by reed canarygrass, Himalayan blackberry, Canada thistle, or other non-native, highly competitive species.

Fisheries

The replacement of the Willow Creek culvert at Pine Street is common to both build alternatives. Some riparian vegetation removal and soil disturbance would be unavoidable. The area would be stabilized, replanted with trees and shrubs, and protected from erosion during the recovery period. Some elevated suspended sediment and turbidity would be expected during and directly following construction.

During pier construction, pile-driving shock waves would be expected to displace fish and the more mobile epibenthic invertebrates temporarily at either location.

Wildlife

Wildlife could be affected by removal of vegetation and habitat; increased isolation of habitats; and increased human activity, glare, and noise.

Undisturbed vegetated corridors provide habitat, serve as travel lanes for seasonal movement of wildlife, and facilitate the movement of species from one habitat type to another (Adams and Dove, 1989; Rodiek and Bolen, 1991; Adams, 1994; Knutson and Naef, 1997). Habitat connectivity declines with increased human modification of the landscape; the use of corridors in land use planning attempts to maintain some of the natural landscape connectivity (Adams and Dove, 1989). The proposed project, in particular the relocation and widening of SR 104 to provide ferry access, would have the potential for increasing the isolation of existing wildlife habitat in the project area. The highway could further reduce the existing linkage between the upland forest, predominantly located in the south portion of the project area, to the Edmonds Marsh wetland complex in the northeastern portion of the project area.

Many wildlife species (e.g., birds, muskrats) are able to move elsewhere during construction, if alternative habitats are available and are not already occupied by other (competitive) species. However, animals that require a particular habitat type that is not readily available near the project area would be heavily affected by the loss of that habitat. Small mammals, amphibians, and reptiles in these areas may not easily relocate and may not survive. Some alternative forest habitat is available for displaced wildlife to the southeast of the project area; however, much of the surrounding area is currently landscaped with ornamental trees and shrubs around residences, thus, providing minimal wildlife habitat. To the southwest, the forested bluff along Puget Sound exists in a relatively undisturbed state and may provide

refugia for species leaving the project site. These alternative habitats, however, are likely to be populated with other individuals of various species, so it is unlikely that habitat will be available for all displaced individuals.

Increased levels of human activity would adversely affect some species of wildlife. The breeding cycle of the wildlife species affects their sensitivity to human activity; most birds are more sensitive to human activity during their breeding season than at other times. The ability to tolerate human activity ranges widely between species (Castelle *et al*., 1992).

Additional lighting and reflections from man-made surfaces would increase glare in surrounding habitats. Operation of the multimodal center would increase the possibilities for glare in adjacent habitats.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

Vegetation

Urban habitat would be converted to other uses without appreciable impact to vegetation or wildlife. Such areas include portions of existing SR 104, the lower yard of the existing UNOCAL property, and the developed shoreline area. Table 4-9 identifies the areas of habitat that would be affected under each alternative.

The Point Edwards Alternative would result in the permanent loss of approximately 3.56 acres of upland forest consisting primarily of mixed deciduous coniferous forest dominated by Douglas fir, bigleaf maple, western red cedar, red alder and grand fir.

Approximately 800 square feet of the riparian corridor of Willow Creek above the Deer Creek Fish Hatchery would be lost through realignment of the SR 104/Pine Street intersection. However, there would be an overall reduction in the length of Willow Creek confined to culverts as a result of this project. Consequently, there would be a net gain in riparian habitat following construction. Impacts to wetlands are described in detail in the Section 4.8, Wetlands.

Fisheries

The primary long-term biological impact of the proposed ferry pier would be a greater area of shaded seafloor. Table 4-10 shows the areas and depths of potential impacts. This analysis assumes that all macroalgae falling within the footprint of the proposed pier would be lost due to shading. No eelgrass is present within 100 yards of the proposed pier footprint and, thus, none would be lost as a result of construction of the new pier. Macroalgae losses (mostly of *Ulva)* at the Point Edwards site would total 34,969 square feet (0.8 acre).

Table 4-9
Area of Impact to Habitat and Proposed Mitigation

Habitat Type	Area with Direct Impacts			Duration of Impact	Mitigation Proposed
	Alternative 1	Modified Alternative 2	Alternative 3		
Edmonds Marsh	None	None	None	None	None
Drainage Channel	None	0.06 acre	0.36 ac	Permanent	Enhancement of marsh's south buffer will provide increased habitat for great blue herons as well as light and activity abatement. Wetland along the daylighted portion of Willow Creek will replace wetland impacted by relocation and daylighting of stream.
Detention Pond 1	None	1.0 acre	1.0 acre	Permanent	Same as above
Forested/Shrub Wetland	None	None	None	None	None
Riparian Corridor	None	800 square feet	800 square feet	Permanent	Willow Creek will be daylighted downstream. Over-sized culvert will improve wildlife linkages.
Upland Forest	None	3.56 acres	4.9 acres; 0.3 acre is wetland buffer	Permanent	Landscaped areas will include trees, and unforested disturbed area between the Edmonds Marsh and the terminal access road will be forested
Aquatic (Photic Zone)	6.7 acre shaded or scoured	3.0 acres shaded or scoured	9.1 acres shaded or scoured	Permanent	Eelgrass and macroalgae beds at the existing terminal would be restored
Aquatic (Below Photic Zone)	None	0.49 ac shaded	None	Permanent	Eelgrass and macroalgae beds at the existing terminal would be restored

Table 4-10
Areas Affected by Pier Shading, Propeller Scour, and Pilings

		Existing Ferry Pier		UNOCAL Pier		Total Restored Area[1]		Mid-Waterfront Pier[2]		Point Edwards Pier[3]		Net Change[1]			
												Mid-Waterfront		Point Edwards	
		(ft^2)	(acres)	(ft^2)	(acres)	(ft^2)	(acres)	(ft^2)	(acres)	(ft^2)	(acres)	(ft^2)	(acres)	(ft^2)	(acres)
Total area shaded	In photic zone[4]	24,670	0.6	23,472	0.5	48,142	1.1	105,861	2.4	62,801	1.4	-57,719	-1.3	-14,659	-0.3
	Below photic zone	0	0	0	0	0	0	0	0	30,539	0.7	0	0	-30,539	-0.7
	Total area shaded	24,670	0.6	23,472	0.5	48,142	1.1	105,861	2.4	93,340	2.1	-57,719	-1.3	-45,198	-1.0
Eelgrass and macroalgae beds shaded	Eelgrass	11,928	0.3	0	0	11,928	0.3	14,821	0.3	0	0	-2,893	-0.1	11,928	0.3
	Macroalgae	819	0	0	0	819	0	29,209	0.7	17,992	0.4	-28,390	-0.7	-17,173	-0.4
	Combined	12,747	0.3	0	0	12,747	0.3	44,030	1.0	17,992	0.4	-31,283	-0.7	-5,245	-0.1
Eelgrass and macroalgae beds lost due to propeller-wash scour	Eelgrass	100,105	2.3	0	0	100,105	2.3	19,585	0.4	0	0	80,520	1.8	100,105	2.3
	Macroalgae	164,201	3.8	0	0	164,201	3.8	419,837	9.6	31,644	0.7	-255,636	-5.9	132,557	3.0
	Combined	264,306	6.1	0	0	264,306	6.1	439,422	10.1	31,644	0.7	-175,116	-4.0	232,662	5.3
Total affected area[8]	Eelgrass	112,033	2.6	0	0	112,033	2.6	23,541	0.5	0	0	88,492	2.0	112,033	2.6
	Macroalgae	165,020	3.8	0	0	165,020	3.8	423,208	9.7	34,969	0.8	-349,004[7]	-8.0[7]	130,051	3.0
	Combined	277,053	6.4	0	0	277,053	6.4	446,749	10.3	34,969	0.8	-169,696	-3.9	242,084	5.6
	Nonalgae covered surface (in photic zone)	12,742	0.3	23,472	0.5	36,214	0.8	0	0	44,809	1.0	36,214	0.8	-8,595	-0.2
	Total	289,795	6.7	23,472	0.5	313,267	7.2	446,749	10.3	79,778	1.8	-133,482	-3.1	233,489	5.4
Piling footprint		858	0	1,614	0	2,472	0.1	5,721	0.1	15,887	0.4	-3,249	0	-13,415	-0.3
Piling footprint and halo[5]		5,868	0.1	9,901	0.2	15,769	0.4	7,828	0.2	6,557	0.2	7,941	0.2	9,212	-0.2
Barnacle and mussel community on piling[6]		-9,070	-0.2	-17,662	-0.4	-26,732	-0.6	18,815	0.4	19,195	0.4	-7,917	-0.2	-7,537	-0.2

[1]Assumes the full removal of the UNOCAL pier and partial removal of the existing Edmonds pier (removal of the transfer span and dolphins

[2]The pier design for full build-out in FEIS (narrowed, split-pier).

[3]The net change is the difference between the project alternatives and the existing piers (e.g. Existing pier + UNOCAL pier - Point Edwards). A positive number represents a net gain of habitat. A negative number represents a net loss.

[4]The photic zone is assumed to be at and above -70 feet MLLW.

[5]The "halo effect" is the accumulation of shell debris at the base of a piling from barnacle shell fallout and other debris from the invertebrate community encrusting on the piling surfaces above. This forms a ring around pilings at their base and limits the use of the area by clams and other non-mobile benthic infauna in this zone. The calculated areas assumes that the ring extends outward 18 inches from each piling around the entire perimeter.

[6]Assumes a vertical zonation of 6.0 feet of this community.

[7]Note that these numbers do not add up with respect to area restored and area impacted. The reason is that propeller wash from the Mid-Water front terminal would extend into the restoration area offshore of the existing terminal, thus precluding restoration of 90,816 square feet (2.1 acres) of macroalgae beds. Adjustment for this has been made in these two foot-noted numbers only. The rest of the table reflects full restoration.

[8]The numbers in these rows are not the sum of shaded and propeller wash loss numbers. Instead, the two sources of impact overlap each other. The numbers in these rows reflect the cumulative, nonoverlapping surface areas.

The planned mitigation for this loss of macroalgae would result in a net gain of 112,000 square feet (2.6 acres) of eelgrass and 130,051 (3.0 acres) of macroalgae, assuming 100 percent successful restoration (see the “Mitigation” section under Section 4.9, Vegetation, Fisheries, and Wildlife, for details). Although eelgrass mitigation is not always successful, the likelihood of success is very high at the existing ferry dock because this location was once part of a continuous bed.

Propeller wash from the ferries is the primary factor for eelgrass and macroalgae losses at the existing ferry terminal (more so than shading). Shifting propeller scour impacts from the existing ferry terminal to the Point Edwards site would provide net benefits to marine habitat and could be viewed as compensation for shading and scour impacts at Point Edwards. As previously noted, the net impact of pier removal and pier construction would result in an increase in eelgrass bed area and a large increase in macroalgae bed area. The size of the area affected is readily apparent in Figure 3-12, as demonstrated by the shapes of the eelgrass and macroalgae beds. By ending operations at the existing ferry terminal and restoring bottom contours with appropriately sized materials and planting eelgrass to a depth of -30 feet MLLW, about 242,084 square feet or 5.6 acres of ocean bottom could be restored with eelgrass and macroalgae (Table 4-10).

The wood pilings of the UNOCAL and existing ferry piers are heavily encrusted with barnacles and mussels. Barnacle/mussel encrustment, which can be 8 inches thick, form a substrate supporting a rich community of organisms including amphipods, various worms, and crustaceans, and ultimately larger shrimp, crabs, and fish living in association with the piles. This community would be removed when the two piers are removed. A comparable community would start to establish on the piles of the new ferry pier within 6 months; full recovery would occur within a period of 5 to 6 years.

The Point Edwards pier would provide 19,195 square feet of new surface for this type of community, in a 6-foot vertical band on each piling within the intertidal zone; however, the proposed mitigation to remove the two existing piers would negate this gain. The resulting condition would be a net loss of 7,537 square feet of barnacle/mussel community. The importance of this small loss is unknown, however, because this type of habitat is not generally thought of as being used by juvenile salmonids, or their primary forage species.

Another related issue is benthic community alteration due to substrate changes resulting from changes in the amount of barnacle shells falling from pilings. When barnacle and mussel shells fall from pilings, they accumulate around the piling bases in a “halo” or ring. This alters the character of biological community in this localized area. It is uncertain these changes constitute an impact; however, the surface area of “halos” or "shell hash" was estimated for the UNOCAL pier pilings, the existing ferry terminal pier, and the proposed Point Edwards pier. The project would result in a net gain or restoration of sand seafloor of 9,439 square feet. The relevance of this alternation to salmon is not well known, but it is likely to be positive. Sand and mud habitats have been shown to be more productive than gravel or coarse grain habitats for the epibenthic invertebrate prey items forming the bulk of juvenile salmonid diets.

The long-term impacts of the pier on hardshell and geoduck clams are not precisely known, at least within the footprint of the pier. Substrate, and thus habitat, would still be available under the new pier but the effects of altered hydraulic (current) condition are not known. Considering that geoduck clams do not live in high-energy environments, and the area subject to propeller scour is between the depths of -20 and -50 feet MLLW, geoduck clams in the propeller wash zone would likely be adversely affected. Geoduck clams are at their highest densities in Puget Sound at depths of -30 to -60 feet MLLW. Hardshell clams, whose habitat (mixed substrates between +2 and -6 feet MLLW) lies out of the range of scour impacts, would be unaffected by this factor. The physical displacement of hardshell clams by pilings and associated shell debris rings (halos) of the new pier in the intertidal and shallow subtidal zone (+4 to -6 feet MLLW) was calculated to be 885 hardshell clams (primarily littleneck butter clams), counting individuals of all sizes and all species. The removal of the UNOCAL pier would restore hardshell clam habitat, supporting an estimated 3,097 hardshell clams. The net change would be equivalent to an increase of 2,212 hardshell clams.

The gravity anchors holding the floating pontoon breakwater in place would alter sea floor character offshore of the terminal. The five anchors would be concrete boxes measuring 46 by 46 feet (covering 10,580 square feet of sea floor) and 30 feet tall. These structures would create reef-type habitat for rockfish, lingcod, and other reef-oriented species. There would be a corresponding loss of soft substrate habitat, which is used primarily by flatfish. The anchors would be situated at a depth of 190 to 280 feet.

It is the policy of WDFW to require replacement of creosote-treated wood pilings with concrete or steel pilings where possible, because creosote is a carcinogen. The Point Edwards Alternative would remove 834 creosote-treated wood pilings and replace them with 309 steel pilings. The long-term consequence of this action cannot be quantified but can certainly be viewed as beneficial by improving sediment and water quality.

There is some concern among biologists that piers may cause higher predation mortality rates in juvenile salmonids by diverting them away from shoreline shallows into deeper waters along pier perimeters. Tall narrow piers, such as the existing UNOCAL pier, may either create a partial seaward diversion of migrating juvenile salmonids, principally fall chinook, pink, and chum salmon, or not affect them at all. Research at the Manchester Navy fuel pier, of similar construction to the UNOCAL pier, indicated that about one-half of the juvenile salmon (chum) swam under the pier and one-half swam around the pier (Dames and Moore, 1994). Larger, wider piers that are darker underneath tend to discourage under-pier passage and to encourage juvenile salmon to go around the piers (at least during the daytime) where predators may have more opportunity to feed on them. The dynamics of light intensity (shading) and migratory avoidance by juvenile salmonids are poorly understood and the importance of a brief diversion offshore is unknown.

Two studies (a literature review and a field study) were conducted on behalf of WSF to elucidate the issue of shading and migratory avoidance (Simenstad *et al*. 1999; Shreffler and Moursund, 1999). The literature review found no

documentation of impacts but warned that this did not provide the basis for conclusions. The field study was compromised by the premature loss of 98 percent of the experimental fish. Observations of the remaining 1,300 fish did not indicate that fish were put at risk from coming in contact with a pier structure. The conclusion made was that "the fundamental question of whether ferry terminals are a 'barrier' to juvenile salmon migration remains unanswered" (Sheffler and Moursund 1999).

In response to this unknown factor and the ESA listing of Puget Sound chinook, the ferry pier at Point Edwards was redesigned to facilitate under-pier and longshore passage. The principal design element of the ferry dock is that it would be composed of three separate parallel piers instead of one continuous pier (Figure 2-3). This design would leave gaps between piers for lighting purposes. Reflective paint would be painted on the underside of the pier to further maximize light under the pier. The probability that these design features would be successful in producing conditions that would allow most of the migrating salmon smolts to pass under the piers is expected to be moderate to high.

Impact analysis on fish passage is difficult because the presumption of negative impact is based largely on conjecture and because the pier design to alleviate this condition is unprecedented. If the assumption is made that juvenile salmon, including chinook, would pass under the pier, then impacts would be negligible. If some or all of the juvenile salmon travelling along the shoreline would be diverted around the pier, despite the design changes, minor impacts would be possible although unknown.

The Point Edwards Alternative would reconfigure and relocate the lower 1,275 feet of Willow Creek, which currently flows within a culvert. The existing culvert is considered a partial block to migrating adult salmon because it is so long and its outlet is frequently blocked by sand. Gradient is not a factor here because the slope of the culvert is very gradual.

The new configuration for Willow Creek would result in a substantial improvement in salmon passage and habitat quality for salmonids. The new configuration would replace the existing culvert with a shorter, 150-foot-long culvert and a 30-foot-long culvert (bottomless arch or box) located under a terminal service road. These shorter culverts would not pose an impediment to salmon passage. Aquatic insect (food) production would increase because more of Willow Creek would be open and have riparian vegetation. The presumed result should be an increase in salmon production in Willow Creek. This should also benefit bull trout indirectly through increased foraging opportunity.

Improved fish passage should increase the number of salmon (coho) returning to the hatchery. Some of these fish would spawn in the reach just below the hatchery. The removal of the existing barrier culvert at Pine Street would allow salmon to utilize the reach above. This would also benefit salmon runs in Willow Creek and indirectly benefit the wildlife species (e.g., bald eagles) that prey on salmon during the spawning season.

At the present time, there is still some PAH contamination in the area where the stream relocation would occur. This area has been undergoing clean-up for a number of years and would be "clean" before relocation construction would begin. However, it is recognized that there are varying levels of "clean" and the final level of clean-up (to commercial/industrial) levels may not be viewed as clean enough to come in contact with an open stream channel. Of course, the contaminated groundwater is presently in contact with the stream and has been for many decades. Depending on how Ecology and other state resource agencies view the situation, a backup plan has been prepared for isolating the stream channel from groundwater in this new lower reach. If necessary, as determined during consultation, a 30-mil PVC liner in conjunction with a concrete channel could be placed under a normal earth/rock/gravel inset channel and still support normal biological processes such as riparian community growth. Because it is currently uncertain as to whether or not this would be needed, a detailed design has not been prepared. Since the riparian community in this reach is either presently grasses or culvert, little riparian function would be lost while the riparian community grew towards maturity. As with all stream restoration projects, there would be some sediment input to the stream during the first wet season. This would be minimized by use of jute matting, hydroseeding, silt fencing, and all the other high-tech measures. The consequence of a small and temporary input of sediment in this reach would be relatively minor. This reach is currently a culvert all the way to the beach. The reach immediately upstream is best characterized as a ditch with a bottom composed entirely of silt. This reach is intertidal. As a result, water runs upstream with each high tide greater than 9.6 feet.

By replacing the current culvert outlet to Puget Sound with an open channel in the intertidal zone, the periodic sand blockage problem would be solved. The enlarged culvert size would allow for a freer exchange of saltwater into the salt marsh. This would enhance the ecological functions of this environment and probably enlarge the size of the salt marsh as well. A tide gate would be installed at the railroad culvert , but would be left open except under certain extreme conditions. The only condition that would cause the tide gate to be closed would be extreme high tides coupled with strong storm surge that would otherwise result in flooding the low-lying commercial area just to the north of the salt marsh. This condition is anticipated to only occur about four to five hours per day on perhaps three days per year.

Currently, the culvert at Pine Street partially blocks salmon migration because of its steep gradient; the Deer Creek Hatchery water intake weir also blocks salmon passage at this location. The new culvert would be a substantial improvement with its bottomless arch design and simulated stream channel form. The replacement culvert would meet WDFW fish passage design criteria. This would open up about 1,312 feet of riffle habitat above. The Brackett's Landing Foundation has expressed an interest in improving this reach with instream habitat enhancement structures to create pools and habitat diversity.

Long-term water quality impacts would be precluded in Willow Creek by treating and discharging stormwater directly to Puget Sound. Because stormwater from the facility would be detained and treated, most of the oil, grease, and some of the heavy metals would be removed prior to discharge. The system would use the

existing Willow Creek outfall, eliminating the need to construct a new conveyance system.

The potential for harassment to salmon adults during run periods (about 1 month) is an issue because of the large number of people coming in close proximity to Willow Creek: the creek would run through the area in front of the terminal. It should be pointed out that Willow Creek does not support a consistent run of coho other than hatchery origin. The proposed project would do much to improve the possibility of sustaining a small naturalized run by opening up the outlet and restoring passage at Pine Street, thus setting the stage for a meaningful recovery effort in Willow Creek. The impact of harassment would be minimized by the establishment of a riparian buffer (about 10 to 20 feet wide). The riparian buffer would be irrigated and managed as both a visual amenity and as shade/overhead cover for the creek. The channel would have numerous vertical and overhead surfaces for fish to hide against and underneath, such as in-water large woody debris and large boulders. There would also be numerous channel-spanning logs. As a result, there should be ample cover to limit human disturbance.

Wildlife

Following completion of construction, site restoration and revegetation along the SR 104 corridor would partially restore habitat and upland wildlife species would likely return, although several years would pass before the vegetation is established and large enough to afford cover for most wildlife. However, there would be a permanent loss of 3.56 acres of upland forest habitat and a corresponding loss in wildlife usage. Species that currently use this forested habitat, such as the downy woodpecker, the black-capped chickadee, and the American robin, are likely to continue using the remaining forested habitat during operation of the facility; the number of individuals of such species, however, is likely to decrease.

Willow Creek riparian habitat and tidal and emergent wetland habitat would increase due to removal of the long culvert that conveys the creek from the UNOCAL facility to its marine outfall, having a beneficial impact upon wildlife. The new stream channel would provide foraging habitat for numerous species of birds and for small mammals such as mink and river otter.

Great blue herons roost during daylight hours and have nested along the south end of the Edmonds Marsh and on the hillside above the UNOCAL facility (Thompson, pers. comm. 1998). UNOCAL personnel and birding recreationalists indicate that six nests were active in 1997 and three nests were active in 1998. The rookery has not been active since that time (Thompson, pers. comm., 2003). Figure 2-3 shows the previous location of the heron nests and a 100-foot buffer zone.

Great blue herons select trees for day roosts based more on proximity to foraging areas than type of tree. Although numerous trees are available between the existing SR 104 and the UNOCAL site which may be used by herons for day roosts. It has been established that herons are less tolerant of disturbance at their rookeries (nesting colonies) than at other locations (WDFW, 1991; WDFW http://wdfw.wa.gov/hab/phs/vol4/gbheron.htm; Jones and Stokes, 1991). If construction impacts were not mitigated, it is unlikely that great blue herons would

nest on the south side of the Edmonds Marsh. Great blue herons are unlikely to move to another nesting location in the project vicinity, as appropriate alternative sites are not available (Thompson, pers. comm., 1999). However, with the mitigation measures proposed as part of this project, roosting and nesting at the marsh-side location may recur and actually increase over time, as the buffer between this site and the terminal access road would increase due to the project. The buffer would provide more nesting sites and a visual buffer between the terminal access road and the marsh (e.g., planting cottonwood and Douglas fir trees; fencing this boundary with a solid fence) and would improve habitat over current conditions (Thompson, pers. comm., 1999). The hillside nesting location is likely to remain abandoned during construction and subsequent operation of the Edmonds Crossing project. Foraging habitat would increase with the daylighting of Willow Creek through the facility and the shoreline area.

Waterfowl and California sea lions would be unlikely to be affected by operation of the ferry at Point Edwards; the species currently using this habitat are acclimated to human activity.

Phase 1

Vegetation

Impacts to vegetation under Phase 1 would be similar in nature to full buildout. Because the access road would be built in its ultimate location and because the Phase 1 surface parking and bus turnaround area would be constructed in what is primarily an unvegetated area, impacts to vegetation are virtually identical to full buildout.

Fisheries

The impacts of operation of Phase 1 would be less than with full buildout. Shading of subtidal marine habitats would be less because the surface area of the pier would be smaller. There may be more of a tendency for juvenile salmonids to pass under the narrower pier instead of being diverted and directed away from shore along the pier periphery, as envisioned in full buildout. This situation may lessen predation-related impacts.

Wildlife

The area of wildlife habitat impacted by Phase 1 would be almost identical to the area impacted under full buildout. Additional impact to wildlife would occur as a result of the additional period of construction with its associated noise and human activity.

Alternative 3: Mid-Waterfront Site

Full Buildout

Vegetation

This alternative would result in the loss of approximately 4.9 acres of upland mixed forest. About 0.3 acre of wetland buffer consisting of mixed upland deciduous coniferous forest would be cleared along the southern margins of the forested/shrub portions of the Edmonds Marsh complex. Impacts to the Willow Creek riparian corridor would be the same as for Point Edwards. In addition, there are several potential impacts associated with extension of SR 104 and ferry access facilities north from Point Edwards to the north side of the Edmonds Marina. SR 104 would be extended through a fully developed area. Vegetation consists of small landscaped areas and scattered herbs in unpaved areas. Substantial impacts to vegetation are not anticipated.

Fisheries

Long-term impacts at the Mid-Waterfront site would mostly be the same as those described for the Point Edwards site, with six major exceptions:

- Impacts to eelgrass and macroalgae beds would be much greater.
- Propeller wash would prevent planned restoration of about 90,816 square feet (2.1 acres) of macroalgae offshore of the existing terminal.
- The Mid-Waterfront site would require relocation of two sewer outfalls, which would require trenching in the intertidal and shallow subtidal zones.
- A portion of an artificial reef, constructed for the benefit of the recreational fishing pier users, would likely be damaged by propeller wash, if not by construction activities, if it were not moved first. Moving them would likely damage them to some degree, at least temporarily.
- The Mid-Waterfront terminal would not require a floating pontoon breakwater and its associated gravity anchors.
- The Mid-Waterfront pier would have 33 more 48-inch-diameter pilings than the Point Edwards pier.

The Mid-Waterfront Alternative would require the relocation of two City of Edmonds sewer outfalls and the Dayton Street storm drain as pile-driving would otherwise destroy them. This would require trenching through the intertidal and nearshore zones. Since the outfalls would need to be buried for protection, perhaps 6 to 8 feet, this would require the driving of sheetpile walls to contain the trenching disturbance. The minimum width of disturbance in the intertidal zone would be at about 10 to 12 feet, or slightly wider than a trackhoe. Offshore, the width could be slightly narrower, but not by much, as a barge-mounted dredge would need some room for bucket deployment error. All plants and nonmobile animals within the footprint of the trench would be lost in the process. This would include macroalgae,

eelgrass, clams, worms, and small or burrowing invertebrates. For the most part, fish and mobile invertebrates, such as Dungeness crabs, would move away from construction activities and thus avoid direct impact. There would be a loss of habitat function in the footprint of disturbance lasting one year for initial colonization and perhaps five years for full recovery. The small bottom-dwelling organisms that form an important component of juvenile salmon diets would recover in the first summer following construction. Some of the area trenched for the two sewer outfalls would not be replaced by sand/mixed substrates, but will instead be replaced by riprap to protect the terminal portion of the outfalls.

Eelgrass and macroalgae beds offshore of the Mid-Waterfront site are expansive. About 14,821 square feet (0.3 acre) of eelgrass and about 29,209 square feet (0.7 acre) of macroalgae would be effectively removed by pier shading. Impacts to eelgrass and macroalgae beds from ferry propeller scour would be much greater at the Mid-Waterfront site; about 19,585 square feet (0.4 acres) of eelgrass and 419,837 square feet (9.6 acres) of macroalgae would be removed, based on the scour pattern at the existing Edmonds ferry terminal. This amounts to about 13 times as much macroalgae loss as with the Point Edwards Alternative.

WDFW policy states that no net loss of eelgrass and/or macroalgae beds is allowed. Where beds are removed, an equivalent effective amount of similar habitat must be created. Effective habitat is functional healthy eelgrass or macroalgae beds that will grow and persist in the long term. There is, however, a low success rate for establishing eelgrass beds in locations where they currently do not exist. As a result, it is WDFW policy to require a mitigation ratio range between 4 to 1 and 10 to 1 to compensate for the success uncertainty. The Mid-Waterfront Alternative would have a 5 to 1 ratio, and since the restoration area previously supported eelgrass, success should be high. Restoration of macroalgae beds requires only time. Most macroalgae species require some form of hard substrate for attachment. At the Mid-Waterfront location, most of the macroalgae are attached to worm tubes. It is presumed that macroalgae would become established when the worms (mostly *Diopatra ornata*) become established (in one to two years). The casings of Diopatra are forming most of the macroalgae holdfast attachment function at this location.

Impacts to hardshell clams at the Mid-Waterfront site would be less than those described for the Point Edwards site, because hardshell clam densities are lower in the Mid-Waterfront vicinity. The loss of hardshell clam habitat area has been calculated to be 133 square feet, which, at the densities present between +4 and -6 feet MLLW, is equivalent to 368 clams (all species). Potential impacts to juvenile salmonids and demersal fish are similar to those described for Point Edwards, as the piers are about the same size and underpier substrates are similar.

Placement of the proposed ferry pier at the Mid-Waterfront site would put the ferry slips directly over the inside edge of a section of an artificial reef. This reef was built in the 1970s for the purpose of enhancing fish habitat adjacent to the public fishing pier. The reef consists of several separate modules, each made of automobile tires bound together in various configurations. Propeller wash would likely break up the modules. If the reef were not moved before construction and operation, this situation could result in tires ending scattered about and potentially on the beach as well as loss of fish habitat quality. Assuming that the reef was moved or rebuilt at

an adjacent location, impacts would be temporary. There would be a temporary disruption of the fish assemblage at the reef, but this would probably not affect the fishing activity or catch success rate for fishermen at the pier, because the fish would reestablish themselves at the new location. There might be a temporary disruption of fishing activity at the pier while the reef was moved.

No spawning areas have been identified in the footprint of the Mid-Waterfront Alternative for any of the shore spawning or nearshore spawning species of concern, including Pacific herring (*Clupea harengus pallasi*), sand lance (*Ammodytes hexapterus*), rock sole (*Lepidopsetta bilineata*), and surf smelt (*Hypomesus pretiosus*). However, sand lance have been observed to spawn on the beach immediately adjacent to the Mid-Waterfront pier location according to the latest WDFW maps (Dan Penttila, WFDW, pers. comm., 2000). Sedimentation-related impacts to the spawning beach would be avoided through in-water construction timing restrictions for pile-driving activities. A site investigation by WDFW may be necessary to assess sand lance spawning prior to the construction of one set of support columns situated in the upper intertidal zone where sand lance spawn.

Wildlife

The Mid-Waterfront Alternative would result in the loss of approximately 4.9 acres of upland forest habitat, and there would be a commensurate loss in wildlife use, as described under Modified Alternative 2 above. About 0.3 acre of wetland buffer would be cleared along the forested/shrub portion of the Edmonds Marsh. Great blue herons that use this area for nesting and as a day roost may be affected, as discussed for Point Edwards. Impacts to the Willow Creek riparian corridor would be the same as for Point Edwards. Waterfowl and California sea lions would unlikely be affected by operation of the ferry in the Mid-Waterfront location; the species that currently use this habitat are acclimated to human activity.

Phase 1

Vegetation

Phasing of the Mid-Waterfront Alternative would result in the same impacts to vegetation as under full buildout; the area between the railroad tracks and the waterfront contains very little vegetation and losses would be minimal.

Fisheries

The ferry pier would be three lanes narrower during Phase 1 than proposed under full buildout. Presumably, the narrower pier would have fewer piles and thus less subtidal habitat disturbance and turbidity. The actual difference between Phase 1 and full buildout would probably be in direct proportion to the difference in the number of piles.

The operation impacts of Phase 1 would be about one-third less than those envisioned under full buildout. The narrower ferry pier would shade less subtidal and intertidal habitats and, thus, would affect a smaller surface area of eelgrass and macroalgae beds. There would be one less ferry slip during Phase 1 than proposed

under full buildout, so a slightly smaller area of eelgrass and macroalgae would be affected by propeller wash scour.

Wildlife

Impacts to wildlife under Phase 1 would be similar to those under full buildout.

4.9.3 Mitigation Measures

Vegetation

Alternatives would be selected that minimize direct impacts to wetlands and mature vegetation. Long-term design-related measures would include the following:

- Avoid the introduction of non-native invasive species, and remove established invasives, where practical
- Plant mostly native shrubs and trees along the margins of the realigned SR 104 to mitigate, in part, for the loss of forested habitat associated with construction and to buffer surrounding habitats from human activity and glare associated with operation of the new multimodal center facility
- Replace snags and other woody debris within the riparian and wetland buffers, and plant native species of trees and shrubs to enhance the vegetative complexity of the habitat, as soon as possible following construction; specific timing will be dictated by Hydraulic Project Approval (HPA) permit requirements

Additional mitigation is noted above in Table 4-9.

Fisheries

Preferred Alternative (Point Edwards Site)

Mitigation of impacts from this alternative would include the following:

- Creosote-treated pilings would be removed during demolition of the UNOCAL and existing ferry terminal piers (Figure 4-11). (Together, the two piers have 834 creosote-treated pilings.)
- The wooden portion of the existing ferry pier would be dismantled and removed, leaving a portion of the structure (the part with a concrete and earthen fill foundation) for use by the City of Edmonds. Removal of this structure would eliminate the potential offshore diversion of juvenile salmonids at this location.
- The shoreline and subtidal areas offshore to -30 feet MLLW at the existing terminal would be restored to its natural slope and contours with fill material suitable for eelgrass. Eelgrass would be planted in an area that is currently devoid of eelgrass, which is approximately 2.6 acres in surface area. The probability for successful re-establishment at this location would be high. This

action would also make it possible for two eelgrass beds, presently divided by the ferry terminal and propeller-wash-induced scouring, to be connected.

- The reach of lower Willow Creek adjacent to the stormwater treatment pond, which would not be impacted by the project, would be restored from its present highly degraded condition. This reach is essentially a channelized ditch with no riparian vegetation other than grasses. The channel would be made to meander slightly, and receive the full treatment described for the new channel section.

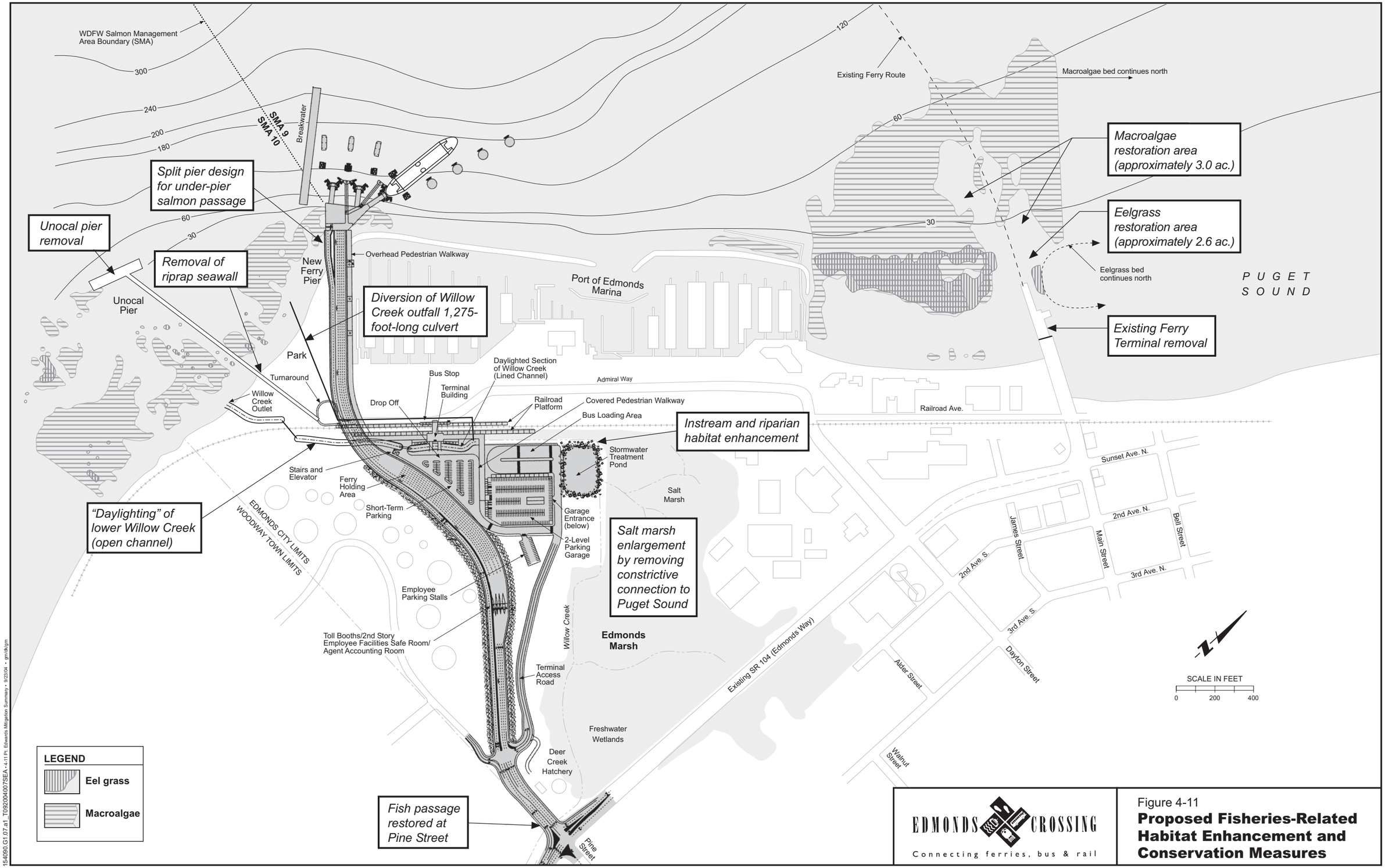
- Interpretive signs would be placed throughout the terminal. The signs would explain the improvements made to the salmon habitat and the uniqueness of the salt marsh to central Puget Sound. Similarly, interpretive signs would be placed on the pier explaining the unique design of the pier. These features would create an interesting and educational amenity. Public education is expected to eventually translate into improved public stewardship of environmental resources.

- A study would be conducted to investigate and evaluate the effects of ferry operations, if any, on under-pier salmon passage at the new terminal. The study design would be developed in collaboration with the jurisdictional agencies and tribal representatives. This information would serve to evaluate future and cumulative impacts for other WSF projects throughout the region. Specifically, the pier design would provide an opportunity to study the behavior of juvenile salmonids at piers, particularly the threshold level of illumination needed for passage under piers. The 30-foot-wide pier to the south (all juvenile salmonids in south and central Puget Sound migrate north), coupled with the widened pier to the north, gives a range of pier width and associated illumination conditions to incorporate into an experimental design.

- There are a number of measures proposed for conservation or mitigation of fisheries resources that involve prescriptive or remedial measures involving vegetation, wetland function, or water quality that are not listed here. These measures are presented in their respective sections in this Final EIS, even though the primary beneficiaries are aquatic communities and fish.

- The culvert at Pine Street would be rebuilt to restore salmon passage. The design would be a bottomless arch with a simulated stream channel configuration consistent with WDFW's *Fish Passage Design Manual* (2000).

- The proposed ferry pier at Point Edwards (and Mid-Waterfront Alternative) is a unique design. It is specifically designed to facilitate unobstructed under-pier passage for migrating juvenile salmonids without offshore diversion. The pier would be split into three parallel elements, with gaps between them to allow for light to penetrate between the decks. The underside of the decks would be painted with reflective paint to take full advantage of light reflected upwards from the water at the underside of the decks. The wide spacing of pilings allows for better light penetration and provides a lowered degree of obstruction to



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EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 4-11
Proposed Fisheries-Related Habitat Enhancement and Conservation Measures

longshore drift. We expect shoreline migrating juvenile salmon to pass under rather than around the pier as a result of lighting conditions. The relatively deep water at the end of the pier reduces propeller-wash scour-related effects and reduces the need for armoring the base of the outside pilings.

- The project was designed to avoid impacts to wetlands (Edmonds Marsh), by skirting the hillside with the approach road and limiting width, and by eliminating some features of the project that would have been desirable from a transportation perspective such as a dedicated bus lane located along the west side of the wetland complex.
- The stormwater treatment system was designed to minimize water quality impacts of the facility. Stormwater treatment would be designed for 100 percent of the project surface area. All treated stormwater would be discharged directly into Puget Sound.
- Impacts to wetlands and buffers would be avoided where possible and minimized through the design process using Ecology's sequencing procedures.
- Wetlands and wetland buffers would be flagged or staked before construction so that activities within these areas can be avoided.
- Storage of all machinery, materials, stockpiled soils, and construction activity in wetlands/wetland buffer, and shoreline areas would be prohibited.
- Existing wetland hydrology would be maintained during construction as far as practical; runoff would be conveyed from all disturbed areas to sediment ponds or interception ditches prior to introduction to wetland areas.
- As part of the UNOCAL pier removal, the riprap shoreline under the pier would be removed. The shoreline would then be pulled back and restored to match the contours of the adjacent shorelines.
- Macroalgae beds would be reestablished in the nearshore area presently barren due to propeller-wash scour at depths beyond that of the eelgrass plantings. This would start at -30 feet MLLW contour extending out to -50 feet MLLW covering an area of approximately 3.8 acres. A method that could be used is to scatter 6- to 8-inch rock (cobble) at a density of two or three stones per square yard. This would greatly improve the process of initial colonization of macroalgae. Otherwise, unaugmented natural recolonization could be relied upon. A decision will be made whether or not to use cobble stone augmentation during the HPA permit process.
- The relocation of Willow Creek would result in a net increase in open channel (1,150 feet) and loss of culvert length (1,125 feet). All appropriate channel habitat enhancement features such as large woody debris, boulder placements, and riparian vegetation planting would be incorporated into the newly built stream channel. Riparian plantings would be made using native species and maintained promoting over-water cover. Spanning logs would also provide this function.

- The 1,275-foot-long outlet culvert would be abandoned as the outlet for Willow Creek and subsequently used as the terminal's stormwater outfall. The creek would discharge to the Sound from an open channel below 6.0 feet MLLW, above which would be a large box culvert set deep into grade extending for 150 feet under the BNSF railroad tracks.

- Salt marsh function would be restored to the Edmonds Marsh by opening up the restrictive culvert. Substantially more saltwater would flow upstream and into the marsh each day with the tides. Salt marshes are one of the most productive estuarine environments and have suffered the greatest losses from development over the years. Salt marshes are very limited in central Puget Sound and thus highly desirable to restore or enhance.

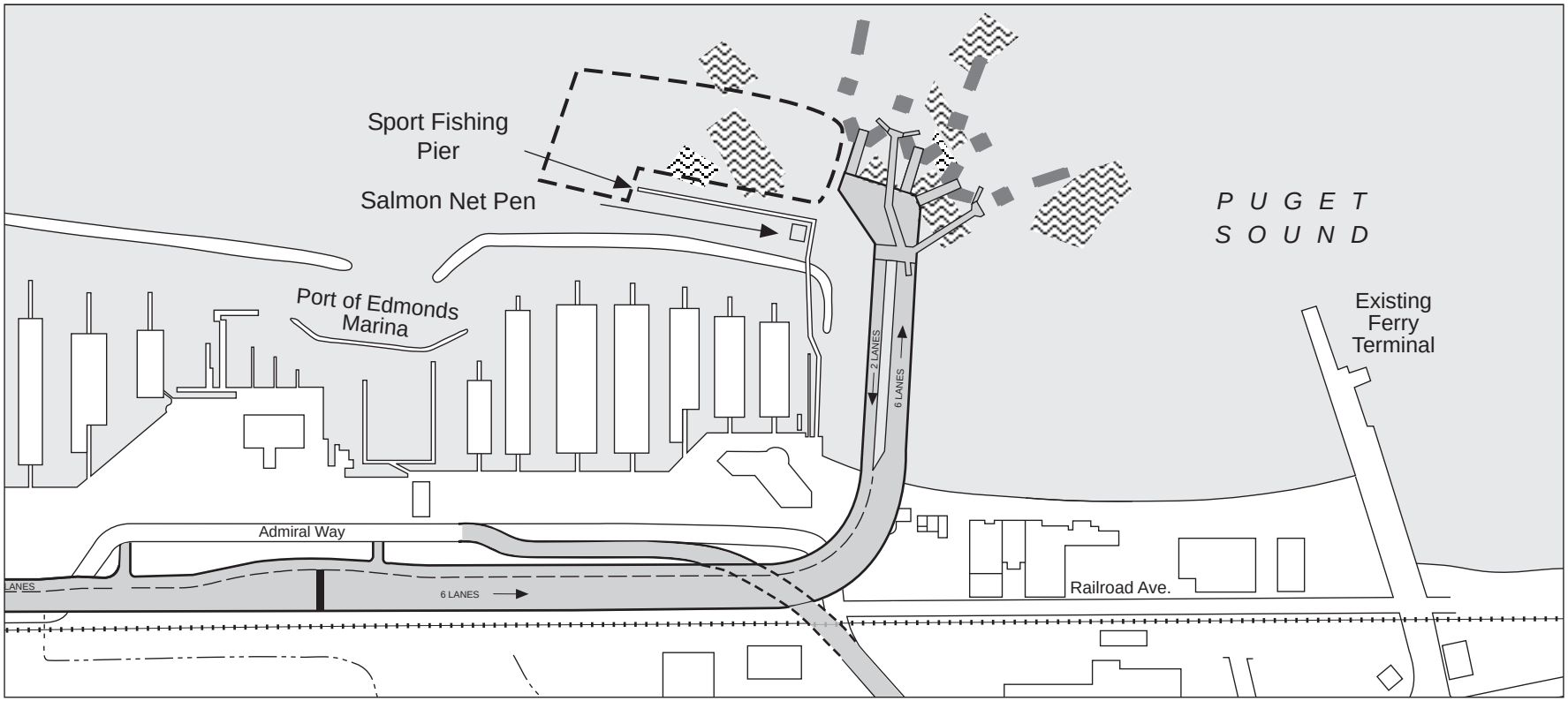
Alternative 3: Mid-Waterfront Site

Mitigation of impacts from this alternative would include the following:

- The wooden portion of the existing ferry pier would be dismantled and removed, leaving a portion of the structure (the part with a concrete and earthen fill foundation) for construction of a marine interpretive center. Removal of this structure would eliminate the potential offshore diversion of juvenile salmonids at this location.

- Filling the dredged/scoured channel off the end of the existing pier to match the adjacent shoreline contours. In the absence of ferry propeller wash scour and the terminal end structures, eelgrass and macroalgae would be expected to recolonize over time. Eelgrass would be planted throughout the area to speed recolonization. The actual amount created would depend on the success of bed establishment at the enhancement site, which is high. The area of macroalgae bed restored for mitigation would be less for the Mid-Waterfront Alternative than with the Point Edwards Alternative and would only partially mitigate for losses. Mitigation opportunity for this resource is diminished relative to the Point Edwards Alternative because the propeller wash plume from the Mid-Waterfront ferry slips would also affect the restoration area at the existing ferry terminal. About 90,816 square feet (1.4 acres) of the macroalgae restoration area would be affected. Based on one-to-one replacement of macroalgae, 349,000 square feet (8.0 acres) of additional macroalgae bed creation would need to be made off site or in adjacent areas. If a mitigation ratio is applied to macroalgae, the area size would be inflated accordingly.

- Moving, reconstructing, or otherwise relocating the sections of artificial reef that would be affected by the ferry pier or by ferry propeller wash (Figure 4-12). The preferred location appears to be adjacent to the south end of the fishing pier. There is no reason to assume that this relocation (a very short distance) would diminish the beneficial purpose of providing habitat for a variety of species that would not otherwise live close to the fishing pier. Actually, some of the artificial reef is too far away from the fishing pier to be very beneficial to fishers. To mitigate for short-term impacts, the reef could be enlarged as



LEGEND

Existing Artificial Reef Areas

Proposed Artificial Reef Areas

SCALE IN FEET
(1" = 400')
0 200 400

SCALE IN METERS
0 50 100

EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 4-12
Alternative 3 Conceptual Mitigation:
Artificial Reef Relocation

compensation. This would not be expensive because the heavy equipment needed would already be on site for pier construction and could be used during down-time. Reef materials are relatively inexpensive.

- The culvert at Pine Street would be rebuilt to restore salmon passage. The design would be a bottomless arch with a simulated stream channel configuration consistent with WDFW's *Fish Passage Design Manual* (2000).

- The proposed ferry pier at Mid-Waterfront (and Point Edwards Alternative) is a unique design. It is specifically designed to facilitate unobstructed under-pier passage for migrating juvenile salmonids without offshore diversion. The pier would be split into three parallel elements, with gaps between them to allow for light to penetrate between the decks. The underside of the decks would be painted with reflective paint to take full advantage of light reflected upwards from the water at the underside of the decks. The wide spacing of pilings allows for better light penetration and provides a lowered degree of obstruction to longshore drift. We expect shoreline migrating juvenile salmon to pass under rather than around the pier as a result of lighting conditions. The relatively deep water at the end of the pier reduces propeller-wash scour-related effects and reduces the need for armoring the base of the outside pilings.

- The project was designed to avoid impacts to wetlands (Edmonds Marsh), by skirting the hillside with the approach road and limiting width, and by eliminating some features of the project that would have been desirable from a transportation perspective such as a dedicated bus lane located along the west side of the wetland complex.

- The stormwater treatment system was designed to minimize water quality impacts of the facility. Stormwater treatment would be designed for 100 percent of the project surface area. All treated stormwater would be discharged directly into Puget Sound.

- Impacts to wetlands and buffers would be avoided where possible and minimized through the design process using Ecology's sequencing procedures.

- Wetlands and wetland buffers would be flagged or staked before construction so that activities within these areas can be avoided.

- Storage of all machinery, materials, stockpiled soils, and construction activity in wetlands/wetland buffer, and shoreline areas would be prohibited.

- Existing wetland hydrology would be maintained during construction as far as practical; runoff would be conveyed from all disturbed areas to sediment ponds or interception ditches prior to introduction to wetland areas.

- As part of the UNOCAL pier removal, the riprap shoreline under the pier would be removed. The shoreline would then be pulled back and restored to match the contours of the adjacent shorelines.

- Macroalgae beds would be reestablished in the nearshore area presently barren due to propeller-wash scour at depths beyond that of the eelgrass plantings. This

would start at -30 feet MLLW contour extending out to -50 feet MLLW covering an area of approximately 3.8 acres. A method that could be used is to scatter 6- to 8-inch rock at a density of two or three stones per square yard. This would greatly improve to process of initial colonization of macroalgae. Otherwise, unaugmented natural recolonization could be relied upon.

- The relocation of Willow Creek would result in a net increase in open channel (1,150 feet) and loss of culvert length (1,125 feet). All appropriate channel habitat enhancement features such as large woody debris, boulder placements, and riparian vegetation planting would be incorporated into the newly built stream channel. Riparian plantings would be made using native species and maintained promoting over-water cover. Spanning logs would also provide this function.

- The 1,275-foot-long outlet culvert would be abandoned as the outlet for Willow Creek and subsequently used as the terminal's stormwater outfall. The creek would discharge to the sound from an open channel below 6.0 feet MLLW, above which would be a large box culvert set deep into grade extending for 150 feet under the BNSF railroad tracks.

- Salt marsh function would be restored to the Edmonds Marsh by opening up the restrictive culvert. Substantially more saltwater would flow upstream and into the marsh each day with the tides. Salt marshes are one of the most productive estuarine environments and have suffered the greatest losses from development over the years. Salt marshes are very limited in central Puget Sound and thus highly desirable to restore or enhance.

- Interpretive signs would be placed throughout the terminal explaining the improvement made to salmon habitat at the terminal and the uniqueness of the salt marsh to central Puget Sound. Similarly, interpretive signs would be placed on the pier explaining the unique design of the pier. These features will create an interesting and educational amenity for waiting ferry passengers.

- Develop and implement a long-term monitoring program to track the effects, if any, of ferry operations on marine resources near the new terminal and recovery at the old terminal. This program would be established through consensus with the jurisdictional agencies and tribal representatives. This information would serve to evaluate future and cumulative impacts for other new projects of the Washington State Ferry System, regionwide. Specifically, the pier design would provide an opportunity to study the behavior of juvenile salmonids at piers, particularly the threshold level of illumination needed for passage under piers. The 33-foot-wide pier to the south and 66-foot-wide pier to the south (all juvenile salmonids in south and central Puget Sound migrate north) gives a range of pier width and associated illumination conditions to incorporate into an experimental design. This is a crucial study need for Puget Sound chinook salmon.

Wildlife

Because wildlife use of the project area depends on the vegetative communities available on the site, it follows that mitigation measures to minimize impacts to vegetation would, in turn, minimize impacts to wildlife. An oversized, bottomless

culvert would be used for the Pine Street overcrossing of Willow Creek. This would allow room for wildlife, including amphibians, reptiles, and small- and medium-sized mammals, to pass beneath the road and help maintain the habitat corridor that currently exists along Willow Creek.

Enhancement of the wetland buffer vegetation along the southern forested edges of Edmonds Marsh (proposed as mitigation in Section 4.8, Wetlands) would have the effect of providing suitable nest and roost trees and cover for herons. This area would be planted with black cottonwood and Douglas fir trees to provide visual screening as well as additional roosting and nesting habitat. In addition, a fence would be installed along the terminal access road, limiting access to this area by humans and pets. A detailed planting plan would be approved prior to issuance of permits by the WDFW.

The daylighting of Willow Creek by this project will create tidal wetland habitat that will likely be used by kildeers, sandpipers, great blue herons, muskrats, and other species of wildlife.

Impacts associated with human activity and glare would be mitigated using vegetated buffers along roads, parking areas, and terminal areas. Buffers would be densely planted with a variety of native evergreen species. Evergreen buffers of 20 feet in width provide a reduction in noise of approximately 4 to 6 dBs (Harris, pers. comm., 1985).

Educational signage describing nesting heron habits could be added at the viewing platform on the north edge of the Edmonds Marsh.

4.9.4 Threatened and Endangered Species and Essential Fish Habitat

The construction and operation of the project is expected to result in effects on some sensitive fish and wildlife species. The Services were initially contacted in 1995, and communications continued through 2004. The Biological Assessment for the project was submitted in June 2003, and the Biological Opinion (BO) was issued on March 25, 2004, from NOAA Fisheries, and on August 30, 2004, by the USFWS.

The determinations of effect in the BOs for fish and wildlife species as well as Essential Fish Habitat follow.

- Bald Eagle—Overall, impacts to bald eagles are expected to be minimal for three reasons. First, there are no known nests in the vicinity (1.0 mile) of the project site. Second, the project is located within an urban and suburban area that currently experiences moderate to high levels of noise and human activity. Bald eagles that currently use this area appear to have acclimated to current levels of activity, noise, and development. Short- and long-term increases in noise and activity due to this project will be incremental, and are not expected to impact eagle use of the project vicinity. Third, concentrations of prey species are not expected to be substantially affected by the project. For these reasons, it is the conclusion of the BA that the project "**may affect**," but is "**not likely to adversely affect**" bald eagles.

- Marbled murrelet—Construction and operation of the Edmonds Crossing Project may affect marbled murrelets. There are no known nests within the action area, and potential nesting habitat does not exist in the project vicinity. The current low level of use in the action area is limited to foraging in marine waters. Murrelets, which presently use the area, are acclimatized to ferry traffic and other shoreline activity. Marbled murrelets may be harmed due to pile-driving activities. The conclusion of the USFWS BO is that the project is "not expected to jeopardize the continued existence of the marbled murrelet in the Puget Sound Conservation Zone" for the reasons summarized below:

  - The population of marbled murrelets in Puget Sound is relatively robust and only a small portion of the marbled murrelets and a small area of Puget Sound would be affected by the project. The small reduction in reproduction and numbers is not expected to appreciably reduce the likelihood of survival or recovery of marbled murrelets in Puget Sound.
  - A number of conservation measures are included in this project that will minimize adverse effects to marbled murrelet and are consistent with recovery actions in USFWS (1997).

  This project has been granted an Incidental Take Permit, as described in the USFWS BO (August 2004). The effect of the take is not likely to result in jeopardy to marbled murrelets in Puget Sound. The Incidental Take Permit includes "Reasonable and Prudent Measures" and "Conservation Measures" for marbled murrelets, which are described further below under the heading *USFWS Terms and Conditions and USFWS Conservation Measure*.

- Steller sea lion—It is the conclusion of the biological assessment that Steller sea lions are not likely to be adversely affected by construction or operation of the Edmonds Crossing project. There are four reasons for this. First, Steller sea lions do not breed or congregate in Puget Sound. Second, the overall prey base for this species is not likely to be significantly affected by construction or operation of this project. Third, although Steller sea lions, if present within the area, may temporarily avoid the immediate project area during construction of the ferry slip, they are likely to return following construction. Finally, Steller sea lions that occasionally use the waters off of the project site are acclimated to human activity and noise, and are unlikely to be affected by operation of the terminal. For these reasons, it is the conclusion of the BA that the project "**may affect**," but is "**not likely to adversely affect**" Steller sea lions.
- Humpback whale—No effects to humpback whales are expected for three reasons. First, humpback whales are infrequent visitors to Puget Sound; documented humpback whale occurrence within the Puget Sound Region is limited to one to two observations per year. Second, effects on the overall prey base will have an inconsequential effect on humpback whales. Third, humpbacks are unlikely to be affected by construction of the Edmonds Crossing Project as they prefer deeper waters than are present in the immediate project area. It is the conclusion of the BA that the project will have "**no effect**" on humpback whales.

- Leatherback sea turtle—Leatherback sea turtles will not be affected by construction or operation of the Edmonds Crossing project. Although they may occasionally occur off the Washington outer coast, leatherback sea turtles have seldom been recorded in Puget Sound. Prey species of this species will not be affected by construction or operation of this project. Construction and operation impacts related to the project will be of no consequence to the species. It is the conclusion of this BA that the project will have "**no effect**" on leatherback sea turtles.

- Puget Sound chinook—Effects to chinook salmon are likely to be minimal. Most juvenile chinook will be offshore and/or out of the project area by the time in-water construction begins. However, small numbers may still be present in the nearshore area. Pile driving may have some effect on a small number of juvenile chinook. There will be a temporary reduction in habitat function due to turbidity and suspended fall-out during pile driving, piling removal, breakwater disassembly, and breakwater reconstruction. The conclusion of the NOAA BO is that "the proposed action is not likely to jeopardize the continued existence of Puget Sound chinook." The determination of no jeopardy is based on the following:

  - "Pile-driving activities will occur when only a small number of chinook salmon are likely to be present. The use of vibratory devices for the initial piling placement will minimize the use of hammer-type drivers. For final proofing of the pile, a bubble curtain, or other BMP to attenuate noise at, or below, the 180 dB will be used. Also, in-water work will be conducted within WDFW approved work windows to minimize the number of salmonids from coming in contact with effects of construction activities."

  - "Temporary and permanent changes will be made to enhance habitats through placement of pilings at the proposed ferry pier and removal of pilings at the UNOCAL Pier and the existing ferry pier."

  - "The effects of shading and potential diversion of migrating salmonids have been minimized with a new split pier design that allows light to penetrate under the pier. The design is intended to facilitate salmon migration under the pier, along the shallow nearshore, rather than around it."

  - Changes in water quality because of instream construction and new impervious surface will be minimized by working within the approved work window, the development and implementation of erosion and spill response plans, as well as permanent stormwater facilities designed to treat to the minimum standards described in the 2001 WDOE stormwater manual.

  This project has been granted an Incidental Take Permit for Puget Sound chinook as described in the NOAA Fisheries BO (March 2004). The Incidental Take Permit includes "Reasonable and Prudent Measures," "Terms and Conditions," and "Conservation Measures" for Puget Sound chinook which are described below the headings *NOAA Fisheries Terms and Conditions* and *NOAA Fisheries Conservation Measure*.

- Coastal-Puget Sound bull trout—Effects to bull trout are likely to be minimal. At the time the marine in-water work window opens (July 16), most

anadromous bull trout will be at or in the river mouth of their natal river. However, the migratory timing is not well known and some fish may still be foraging along the Puget Sound shorelines adjacent to natal rivers, such as the Snohomish River. If present in the project area during construction, bull trout may be affected by pile driving activities. Turbidity from piling driving, piling removal, breakwater disassembly and breakwater reconstruction could disrupt foraging activity in the immediate vicinity during those construction actions. The conclusion of the USFWS BO is that the project is "not expected to jeopardize the continued existence of Coastal-Puget Sound DPS of the bull trout" for the reasons:

- "Only individuals from 3 of the 8 bull trout core areas of the Puget Sound Management Unit and 3 of the subpopulations of bull trout in the Coastal-Puget Sound DPS are potentially affected by the proposed action. Therefore, the effects will be distributed among subpopulations. The numbers of bull trout exposed to the effects of the action is considered to be relatively low. The distribution of effects to a small number of individual bull trout across three subpopulations is not expected to reduce the distribution, reproduction, and numbers of bull trout in the DPS."
- "The marine areas affected are small in relation to available marine habitat. The effects of the action will not preclude the use of the area by bull trout."
- "A number of conservation measures, including implementation of in-water work timing restrictions, the removal of the UNOCAL and existing ferry terminals, habitat restoration in Willow Creek and Edmonds Marsh, eelgrass/macroalgae replacement, and stormwater management, are included as part of the project. These measures will greatly minimize effects to bull trout and are consistent with recovery actions identified in USFWS 2004a."

Essential Fish Habitat (EFH)—Pursuant to Section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations to federal agencies regarding actions which may adversely affect EFH. While the proposed action may adversely affect EFH for chinook salmon, coho salmon, and pink salmon, NOAA Fisheries "believes that the conservation measures incorporated into the project by the FHWA are sufficient to conserve EFH. Therefore, conservation recommendations are not required" pursuant to compliance with MSA.

This project has been granted an Incidental Take Permit for bull trout as described in the USFWS BO (August 2004). The Incidental Take Permit includes "Reasonable and Prudent Measures," "Terms and Conditions," and "Conservation Measures" for bull trout which are described below the heading *USFWS Terms and Conditions and USFWS Conservation Measures*.

For additional details concerning potential effects and minimization measures to protect federally protected threatened and endangered species listed above, the reader is referred to the BA and the BOs.

The following sections are taken from: *Endangered Species Act – Section 7 Consultation, Biological Opinion and Magnussen-Stevens Fisheries Conservation and Management Act, Essential Fish Habitat Consultation* (NOAA Fisheries March 25, 2004) and *Endangered Species Act – Section 7 Formal Consultation, Biological Opinion, USFWS Log # 1-3-03-F-1499, State Route 104 Edmonds Crossing Ferry Terminal in Snohomish County, Washington* (USFWS August 30, 2004).

USFWS Terms and Conditions

The Service believes that the following Reasonable and Prudent Measure (RPM) is necessary and appropriate to minimize the impact of incidental take to bull trout and marbled murrelets:

1. Minimize and monitor the extent of adverse impacts to bull trout and marbled murrelets resulting from pile driving.

In order to be exempt from the prohibitions of Section 9 of the Endangered Species Act, the FHWA and the designated non-federal representative, WSDOT, must comply with the following terms and conditions, which implement the RPMs described above. These terms and conditions are non-discretionary.

The following terms and conditions are required for the implementation of RMP 1:

1. Limit impact pile driving activities to the period between October 1 and February 16.

2. The FHWA shall ensure that a plan is developed and implemented for hydroacoustic monitoring of the peak and RMS sound pressure levels generated during impact-driving of steel piles. This plan must be implemented if no bubble curtain is used. The plan will be developed collaboratively between the USFWS and FHWA. No monitoring or sound attenuation measures will be required for piles driven in the beach exposed at low tides, vibratory driving of any type of pile, or impact driving of wood or concrete piles. During hydroacoustic monitoring, the hydrophone shall be positioned at mid-depths, 10 meters distant from the pile being driven.

    i. If, based on hydroacoustic monitoring results, SPLs exceed 150 dB (re: 1 µPa) (0.032 KPa) for fewer than 50 percent of the impacts and never exceed 180 dB peak (re: 1 µPa) (1 KPa), pile driving may proceed without further restriction; or

    ii. If, based on hydroacoustic monitoring results, RMS SPLs exceed 150 dB (re: 1 µPa) (0.032 KPa) for 50 percent or more of the impacts, or peak pressures ever exceed 180 dB, pile driving may continue, but only with the use of a bubble curtain. The design of the bubble curtain shall be approved in advance by the USFWS.

3. Within 60 days of completing the hydroacoustic monitoring at any site, a report shall be submitted to the USFWS in Lacey, Washington (attn: Jennifer Quan or acting transportation liaison). The report shall include a description of the

monitoring equipment and for each pile monitored, the peak and RMS sound pressure levels with or without a bubble curtain, the size of pile, the size of hammer and the impact force used to drive the pile, the depth the pile was driven, the depth of the water, the distance between hydrophone and pile, and the depth of the hydrophone.

4. The USFWS and FHWA shall collaborate to develop a plan for monitoring the extent of incidental take of marbled murrelets and bull trout. At a minimum the plan should include the following:

    i. Monitoring for behavioral changes of marbled murrelets during impact pile driving activities.

    ii. Monitoring for injured/dead fish or birds during impact pile driving activities,

    iii. The submittal of a summary report including behavioral observations of marbled murrelets before and during pile driving activities, the estimated distances from the pile driving activity, and the number and species of any injured or dead fish/birds that are observed and the estimated distances from the pile driving activity.

The USFWS is to be notified within 3 working days upon locating a dead, injured, or sick endangered or threatened species. Initial notification must be made to the nearest USFWS Law Enforcement Office at (425) 883-8122, or the USFWS's Western Washington Fish and Wildlife Office at (360) 753-9440. Notification must include the date, time, precise location of the injured animal or carcass, and any other pertinent information. Care should be taken in handling sick or injured specimens to preserve biological materials in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered or threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence associated with the specimen is not unnecessarily disturbed.

The USFWS expects that incidental take of bull trout and marbled murrelets will occur. The areas described above are considered by the USFWS to be marine foraging, migratory, and overwintering habitat for bull trout, and marine foraging habitat for marbled murrelets. The RPMs, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the RPMs provided. The FHWA must immediately provide an explanation of the causes of the taking, and review with the USFWS the need for possible modification of the RPMs.

USFWS Conservation Measure

Section 7(a)(l) of the Act directs the federal agencies to utilize their authorities to further the purposes of Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are

discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends the following conservation measures to the FHWA for this project as well as when designing future projects.

CR1. Minimize and monitor the extent of creosote contaminated sediments that will be suspended by the removal of the piles at the existing ferry pier and the UNOCAL pier. To minimize impacts of the potential to expose bull trout and marbled murrelets to creosote and its related constituents we suggest the implementation of the following:

1. Dispose of all creosote-treated material, pile stubs, and associated sediments in a landfill which meets the liner and leachate standards of the Minimum Functional Standards, Chapter 173-304 WAC. Have the contractor provide receipts of disposal to the WSDOT Project Engineer to ensure proper disposal.

2. Contain creosote-treated piling, stubs, and associated sediments on a barge. Place around the perimeter of the barge a row of hay or straw bales, or filter fabric to insure containment.

3. For timber pilings that break or are already broken below the waterline, remove them with a clamshell bucket. To minimize disturbance to bottom sediments and splintering of piling, use the minimum size bucket required to pull out piling based on pile depth and substrate. Empty clamshell bucket of pilings and debris on a contained barge before it is lowered into the water.

4. Surround the work area with an oil containment boom during creosote-treated timber pile removal. Install the boom so that it will also collect any floating debris. Employ the use of oil-absorbent materials if a visible sheen is observed. Maintain the use of the boom until all oily material and floating debris has been collected and sheens have dissipated. Dispose of used oil-absorbent materials in a landfill that meets the liner and leachate standards of the Minimum Functional Standards, Chapter 173-304 WAC. Ensure that the boom is maintained in proper working order. Remove any debris in the containment boom by the end of the workday or when the boom is removed, whichever occurs first. Dispose of captured material in an upland disposal site.

5. Whenever activities will generate sawdust, drill tailings or wood chips from treated timbers, use tarps or other containment material to prevent debris from entering the water. If tarps cannot be used (because of the location or type of structure) a containment boom will be placed around the work area to capture debris and cuttings.

6. Monitor water quality, specifically for creosote and the associated contaminants, during pile removal activities at the existing ferry terminal and UNOCAL site.

7. Within 60 days of completing pile-removing activities report water quality findings to the USFWS in Lacey, Washington (attn: Jennifer Quan or acting transportation liaison). The report should include levels of creosote and the

associated contaminants before and during pile removing activities in both the water column and in the surrounding sediments.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the USFWS requests notification of the implementation of any conservation recommendations (USFWS, 2004).

NOAA Fisheries Terms and Conditions

Reasonable and Prudent Measures: NOAA Fisheries believes that the following RPMs are necessary and appropriate to minimize incidental take of PS Chinook:

- RPM No. 1. The FHWA shall minimize take from water quality degradation.
- RPM No. 2. The FHWA shall minimize take from inwater sound during pile driving.
- RPM No. 3. The FHWA shall minimize take from stormwater runoff caused by additional impervious surface.
- RPM No. 4. The FHWA shall minimize take from disturbance of marine nearshore vegetation caused by the construction activities of the pier, removal of the UNOCAL Pier, removal of the existing ferry infrastructure, and rehabilitation of nearshore areas.

Terms and Conditions: To comply with ESA Section 7 and be exempt from the take prohibition of ESA Section 9, the FHWA, WSDOT, or both, must comply with the terms and conditions that implement the reasonable and prudent measures. Those conservation measures described in the BA, and summarized in this Opinion are incorporated here by reference as terms and conditions of this Incidental Take Statement. The terms and conditions are non-discretionary.

To implement RPM No. 1 above:

- The contractor will implement the Temporary Erosion and Sediment Control (TESC) plan as shown in the contract documents and construction drawings. The plan will be implemented before the start of any ground-disturbing activities. The plan will be based on the proponents' current BMP plans and will include appropriate measures such as silt fences, straw bale dikes, mulching, water bars, slope breakers, and/or the construction of detention and retention facilities to prevent erosion and the discharge of sediment. A plan will also include arrangements for cleaning the treatment facilities during the construction period should a large spill occur.
- For the period from November 1 through March 1, disturbed ground areas greater than 5,000 square feet that are left undisturbed for longer than 12 hours will be covered with mulch, sodding, or plastic sheeting, A construction phasing plan will be provided to ensure that control measures are installed prior to clearing and grading. Clearing limits will be delineated, staked, and flagged.

Disturbed areas along the roadway will be hydroseeded as soon as practical after construction has been completed.

- To minimize the potential for accidents that may result in direct effects to Puget Sound, the proponents or their agent will inform and educate all crew members and all onsite personnel to implement environmental precautions. The contractor will develop and adopt a spill prevention plan. These precautions must include clearly marking the work area and following all applicable laws and permit conditions. To minimize the potential for accidents resulting in direct effects to surface-water quality, construction equipment will be fitted with emergency spill kits and construction crews will be trained in their proper use.

- Prior to operating near the shoreline, all heavy equipment operating within 300 feet of any open water shall be checked on a daily basis for potential hydraulic leaks or other mechanical problems that could result in the accidental discharge of toxic materials. Any necessary repairs will avoid delivery of material to waters. A daily inspection log/checklist shall be maintained by the contractor.

To implement RPM No. 2 above:

- Inwater work will be conducted within approved work windows to protect salmonids from coming into contact with construction activities. Marine inwater work will be restricted to the period between July 16 and February 15. Inwater work in Willow Creek will be restricted to the period between July 1 and September 30.

- The FHWA shall ensure that a plan is developed and implemented for hydroacoustic monitoring of the peak and rms sound pressure levels generated during impact-driving of steel piles. The plan shall be reviewed and approved by NOAA Fisheries. No monitoring or sound attenuation measures will be required for piles driven in the dry beach at low tide, vibratory driving of any type of pile, or impact driving of wood or concrete piles. During hydroacoustic monitoring, the hydrophone shall be positioned at mid-depths, 10 meters distant from the pile being driven.

- If sound pressure levels exceed 150 dBrms (re: 1 µPa) (0.032 KPa) for fewer than 50 percent of the impacts and never exceed 180 dBpeak (re: 1 µPa) (1 KPa), pile driving may proceed without further restriction; or

- If RMS sound pressure levels exceed 150 dB for 50 percent or more of the impacts, or peak pressures ever exceed 180 dB, pile driving may continue, but only with the use of a bubble curtain. The design of the bubble curtain shall be approved in advance by NOAA Fisheries.

  – The initial hydroacoustic monitoring to establish the sound pressure levels being produced will not be required if a bubble curtain is used for all piles.

- If a bubble curtain is deployed, the level of sound attenuation will be determined through hydroacoustic monitoring according to a plan to be developed by the FHWA and submitted for approval by NOAA Fisheries.

- Within 60 days of completing the hydroacoustic monitoring at any site, a report shall be submitted to NOAA Fisheries, Washington Habitat Branch, Lacey, Washington. The report shall include a description of the monitoring equipment and for each pile monitored, the peak and rms sound pressure levels with and without a bubble curtain, the size of pile, the size of hammer and the impact force used to drive the pile, the depth the pile was driven, the depth of the water, the distance between hydrophone and pile, and the depth of the hydrophone.

To implement RPM No. 3 above:

- Design criteria for temporary and permanent stormwater treatment facilities shall meet or exceed current design standards in the Washington Department of Ecology Stormwater Manual for Western Washington (2001) for the treatment of stormwater quality and quantity.

- Construction runoff from disturbed areas will be transported to sediment ponds; interception ditches will be required along the base of all fills; and erosion control fences will be installed at the base of all disturbed areas.

To implement RPM No. 4 above:

- The shoreline and shallow sub-tidal areas out to -30 feet MLLW will be restored to their natural slope and contours with clean fine sand suitable for eelgrass. Eelgrass will be planted through this area for a net increase of 26 acres of eel grass meadow. The probability for reestablishment success at this location is high. This action also increases habitat connectivity between two eelgrass beds divided by the ferry terminal and shallow subtidal propeller-wash-induced scouring action of the ferries.

- Macroalgae beds will be reestablished in the nearshore area currently barren due to propeller-wash scour at depths below those of the eelgrass plantings. This will start at the -30 feet MLLW contour and extend out to -50 feet MLLW covering an area of approximately 164,201 square feet or 3.8 acres. A method that could be used is to scatter 6- to 8-inch rock at a density of two or three pieces per square meter. This will greatly improve the process of initial colonization of macroalgae.

- Continue a long-term monitoring program to track the effects, if any, of ferry operations on marine resources near the new terminal and recovery at the old terminal. This program will be established through consensus with the jurisdictional agencies. This information will serve to evaluate future and cumulative impacts for other new projects of the WSF System, regionwide. Specifically, the pier design will provide opportunities to study the behavior of juvenile salmonids at piers, particularly the threshold level of illumination needed for passage under piers. The triangular shape of this central pier structure in the upper intertidal zone coupled with the 33-foot-wide pier to the

south (all juvenile salmonids in south and central Puget Sound migrate north) gives a range of pier width and associated illumination conditions to incorporate into an experimental design. This is a crucial study need for Puget Sound chinook salmon (NOAA Fisheries 2004).

4.10 Land Use

4.10.1 Studies and Coordination

The following discussion is based on the land use discipline report (CH2M HILL, 1995), which is incorporated into this EIS by reference and additional research conducted in 2002 and 2003.

Study Methodology

Comprehensive plans, zoning codes, and relevant maps for the City of Edmonds and the Town of Woodway were reviewed to identify potential project-related land use impacts. Aerial photographs of the project area were also consulted, and several site visits were made.

Coordination with Agencies and Other Groups

Information from comprehensive plans, zoning codes, and other documents was reviewed through personal contacts with local agency staff to ensure that it was accurate and up to date. The primary agencies contacted to obtain information for this analysis were the City of Edmonds Planning Division in the Community Services Department and the Kitsap County Planning Department.

4.10.2 Impacts

Alternative 1: No Action

Under the No Action Alternative, local traffic congestion, particularly along SR 104, Main Street, Dayton Street, and at major downtown intersections, would continue to deteriorate. Implementation of this alternative would therefore further limit public access between downtown Edmonds and the waterfront, minimizing the shoreline's value as a public resource and amenity, and having a potential adverse effect on existing, nearby residential uses along Sunset Avenue as well as on the redevelopment potential in this area (see "Secondary and Cumulative Impacts" for additional discussion of indirect impacts).

Impacts Common to Both Build Alternatives

Full Buildout

Both build alternatives would introduce a major roadway into an area adjacent to a residential neighborhood (Northwest Woodway). Nearby residences (e.g., the five Woodway residences on Makah Road) would be directly impacted by exposure to increased traffic noise levels under both build alternatives; however, the projected noise increases would not exceed FHWA noise abatement criteria.

Either build alternative would improve overall local access and mobility in the project area by relieving traffic congestion and resolving existing conflicts between ferry, automobile, and train operations. These improvements could allow redevelopment within the project area in accordance with the City of Edmonds comprehensive plan (see "Secondary and Cumulative Impacts").

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

Land Acquisition

The proposed project footprint, under the Point Edwards Alternative, would primarily affect four parcels. As shown in Table 4-11, this alternative would require use of approximately 2.2 acres of existing right-of-way, and would require the acquisition of roughly 22.6 acres of additional land for new right-of-way.

Of the newly acquired acreage, approximately 19.1 acres are in industrial/heavy commercial use (i.e., former UNOCAL tank farm and existing UNOCAL structures, BNSFRR right-of-way). Approximately 1.1 acres of the new right-of-way under this alternative would be required over open water. About 1.2 acres of parkland and 1.1 acres of the Port of Edmonds Marina would be beneath the pier structure; because the structure would be elevated, the activities underneath would be able to continue.

Approximately 2.2 acres of existing right-of-way would be required for reconstruction of existing streets in the project area (i.e., SR 104, Pine Street, Unoco Road, and the Fish Hatchery Road).

No homes would be displaced by construction of this alternative; however, 0.1 acre of residential property would be needed for road right-of-way. There are several buildings on the existing UNOCAL property occupied by Pacific Coast Co. administrative, office, and technical employees. However, it is anticipated that these current activities are temporary and would be eventually removed once the site is remediated, regardless of the Edmonds Crossing project.

Table 4-11
Affected Existing Land Uses

Modified Alternative 2: Point Edwards Site	Acre
Use of existing ROW	2.2
New ROW[a]	
Industrial/heavy commercial[b]	19.1
Business/commercial[c]	0.0
Single-family residential	0.1
Park/open space	1.2
Port	1.1
Over water	1.1
Total ROW for Modified Alternative 2	24.8
Alternative 3: Mid-Waterfront Site	
Use of existing ROW	3.2
New ROW	
Industrial/heavy commercial	6.9
Business/commercial	7.3
Single-family residential	0.2
Port	5.8
Park/open space	0.3
Over water	1.9
Total ROW for Alternative 3	25.5

ROW = right-of-way.

[a]*Assumes that reconstruction of SR 104/Pine Street intersection will occur within existing WSDOT ROW.*
[b]*Includes UNOCAL property and BNRR ROW.*
[c]*Includes retail, restaurants, and multifamily residential uses.*

Comprehensive Plan and Zoning

Property that would be acquired for new right-of-way at Point Edwards is currently zoned CW and MP (Figure 3-17). Approximately 1.9.6 acres of land zoned CW and 20.7 acres of land zoned MP would be acquired (other land to be used would include existing local and WSDOT street rights-of-way).

The current zoning code states that "marine-oriented activities" are permitted uses within the CW district. Local public facilities with marine-oriented services or recreation are identified in the Edmonds zoning code as a permitted primary use. Both the MP1 and MP2 zones permit mixed land uses, including multifamily residential uses, secondary retail uses, and certain types of public facilities. The MP2 zone also permits a multimodal transportation center.

Figure 3-18 shows comprehensive plan designations in the project area. The plan designation most directly affected by the Point Edwards Alternative is identified as Master Plan Development, which encompasses a portion of the existing UNOCAL property. One of the objectives of the *Edmonds Downtown/Waterfront Plan* is to use the existing UNOCAL property at Point Edwards to its best community potential by developing this site with the proposed multimodal center with compatible upland development. This 1994 plan does not specify a particular reuse for the upland portion of the UNOCAL property because at that time it would not have been possible to redevelop the area for several years.

Phase 1

Direct land use impacts of the Point Edwards Alternative, Phase 1, would generally be similar to those of full buildout. Most of the property required for the project's proposed facilities would be acquired before beginning Phase 1 construction, although only a portion of the acreage acquired would actually be converted to roadway and/or terminal-related facilities. Consistency between Phase 1 improvements and local comprehensive plans and zoning codes would be the same as described for full buildout.

Alternative 3: Mid-Waterfront Site

Full Buildout

Land Acquisition

The proposed project footprint, under the Mid-Waterfront Alternative, would affect a total of 12 parcels. As shown in Table 4-11, Mid-Waterfront would require use of approximately 3.2 acres of existing right-of-way and would require the acquisition of roughly 22.3 acres of additional land for new right-of-way. Of the total acreage for new right-of-way, approximately 6.9 and 7.3 acres are in industrial/heavy commercial and business/commercial uses, respectively. About 0.2 acre of new right-of-way is single-family residential, while approximately 1.9 acres would be required to construct the ferry pier structure over open water.

Approximately 0.3 acre of Olympic Beach Park and 1.2 acres of its associated tidelands would also potentially be required for project development at the Mid-Waterfront site, resulting in a direct impact to the area available for recreational uses (see the "Section 4(f) Evaluation"). Approximately 3.2 acres of existing right-of-way would be required for reconstruction of existing streets in the project area (i.e., SR 104, Pine Street, Unoco Road, Fish Hatchery Road, and the Dayton Street underpass downgrade). Rerouting rail spurs on the east side of the existing BNSFRR track for the Mid-Waterfront Alternative could also affect jurisdictional wetlands (see Section 4.8, Wetlands).

This alternative would displace three single-family homes and 24 businesses. Potential housing displacements and impacts to local housing and commercial business markets and to displacements are discussed in Section 4.11, Relocation, and Section 4.12, Social.

Comprehensive Plan and Zoning

Approximately 13.9 and 6.6 acres of land zoned CW and BC, respectively, would be required to implement this project alternative. The majority of the new ferry holding and egress lanes would be located in the CW zone, while the multimodal center would be located within a BC zoning district. The remainder of the project would be located in the Public Use zone (1.8 acres) or would lie within existing local and WSDOT rights-of-way (3.2 acres).

Determination of whether or not the multimodal center would be considered a permitted or conditionally permitted use within the BC district would require interpretation of the current zoning code by the City's Planning Division. It is anticipated that by the time project construction commences, the zoning code would be revised to be consistent with the City's updated comprehensive plan. According to the *Edmonds Downtown/Waterfront Plan*, short-term surface parking and long-term mixed-use development are identified for the Mid-Waterfront multimodal center site.

Figures 3-17 and 3-18 show the Edmonds and Woodway zoning and comprehensive plan designations, respectively, in the project area. The comprehensive plan designations most affected for Mid-Waterfront are Master Plan Development (at the existing UNOCAL property) and Mixed Use Commercial (at the proposed multimodal center site). Impacts to the Northwest Woodway neighborhood designated Forested Residential Park on the Town of Woodway comprehensive plan map would be similar to those described for Point Edwards (i.e., affected more by the redevelopment of the upland portion of the UNOCAL property than the lower portion, where the terminal would be located).

Mid-Waterfront is consistent only with parts of the *Edmonds Downtown/Waterfront Plan*. According to this plan's Special Design Guidelines for the Downtown Core, at least 75 percent of the ground-level building frontage facing the street in this area should be occupied with pedestrian-oriented uses (e.g., restaurants, retail shops). The proposed multimodal center at the Mid-Waterfront site conforms to this guideline because it would include approximately 49,000 square feet of ground-floor retail along Sunset Avenue. However, this alternative would directly conflict with the plan's objective to relocate the ferry terminal and establish a multimodal center at the Point Edwards site.

Construction of the ferry holding and egress lanes between Admiral Way and the BNSFRR right-of-way would directly conflict with the Port's potential plan for future development (maintenance facility, marine repair/retail, and parking) in this area. In addition, implementation of this alternative could affect the location and development of proposed facilities on the west side of Admiral Way, such as the Fine Arts Center and buildings with offices and meeting rooms.

Phase 1

As with the Point Edward alternative, direct land use impacts at Mid-Waterfront would generally be similar to those of full buildout, because most required property acquisition would occur prior to the start of Phase 1 construction.

The Mid-Waterfront, Phase 1, scenario would have the potential to delay or prevent the implementation of elements of the Port of Edmonds' 2001 Master Plan. Direct impacts on uses east of Admiral Way, as described for full buildout of the Mid-Waterfront Alternative, would prevent the development and/or expansion of boat storage facilities and repair areas. Access to the marina during Phase 1 would be limited to a turnoff from the ferry access roadway, just south of the toll booths. The current access from Dayton Street, and all multiple turnoffs into the Port from along Admiral Way, would be eliminated. Over the life of Phase 1, this limitation in access could affect the viability of businesses on the marina property or the level of activity at the marina itself, potentially resulting in delayed implementation of the master plan and/or land use changes on Port property.

4.10.3 Mitigation Measures

The property owners whose land would be acquired for right-of-way would be compensated at fair market value in accordance with the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act (URA) of 1970, as amended, and Washington State's Relocation Assistance—Real Property Acquisition Policy (RARPAP) (Revised Code of Washington [RCW] 8.26). More information related to relocation assistance is provided in Section 4.11, Relocation. For a discussion of mitigations recommended for increased noise levels and air emissions, see Section 4.2, Air Quality, and 4.3, Noise.

WSDOT would not have direct control over measures that would prevent or discourage undesirable land use conversions facilitated by the proposed project. However, WSDOT would coordinate with local planning agencies to identify potential modifications to comprehensive plans, zoning regulations, or capital facilities plans that would strengthen local planning mechanisms to direct appropriate growth in the affected areas. WSDOT would also continue to coordinate with local jurisdictions and regional authorities to integrate the proposed project with other transit-related projects and to minimize unavoidable adverse effects on land uses.

4.10.4 Relationship to Plans and Policies

VISION 2020: 1995 Update and 1995 Metropolitan Transportation Plan

The *VISION 2020 1995 Update* is the long-range growth management, economic, and transportation strategy plan for the central Puget Sound region, encompassing King, Kitsap, Pierce, and Snohomish counties. In general, this plan's vision is for diverse, economically and environmentally healthy communities framed by open space and connected by a high-quality, multimodal transportation system that provides effective mobility for people and goods (PSRC, 1995a).

The MTP provides the more explicit transportation component of *VISION 2020*; it defines long-term transportation strategies and investments for the region's metropolitan transportation system. According to the MTP (specifically, Appendix D, Maps of Major System Improvements by Mode), a "Major Transfer/Terminal" is identified in Edmonds as part of MTP transit improvements (PSRC, 1995b).

Several of the multicounty framework and transportation policies presented in these two plans encourage development of multimodal transportation systems that provide connections between urban centers and promote convenient intermodal connections between all elements of the regional transit system. The Edmonds Crossing project would be consistent with these policies because it would provide easy access to reliable and efficient mass transit and encourage travelers to carpool or leave their cars behind. Furthermore, the proposed multimodal transportation center would function as a hub for passengers to easily transfer between different types of transportation, linking ferry service with train, bus, park-and-ride, bicycle, and pedestrian access.

The No Action Alternative would be inconsistent with these regional policies because it would not provide for a transit-oriented, multimodal transportation system.

Puget Sound Regional Council Destination 2030 Metropolitan Transportation Plan for Central Puget Sound Region

On May 24, 2001, Central Puget Sound leaders unanimously adopted Destination 2030 at a meeting of the PSRC's General Assembly. Destination 2030 does not replace the previously mentioned MTP, but provides added detail and clarification, including strategies, to make implementation of the MTP easier. Compared to the 1995 MTP, Destination 2030 more clearly articulates a broad range of roadway investments, enhances the description of the regional nonmotorized network, identifies high-capacity transit station locations, discusses transportation pricing more thoroughly, and shows the benefits of transportation investments at the sub-regional level (PSRC, 2001).

Destination 2030 supports planning efforts in every part of the region with a focus on improvements that are regionally important, including new and relocated ferry terminals. Destination 2030 (specifically Appendix 9, Projects) identifies the Edmonds Crossing project as a ferry project on the Metropolitan Transportation System (MTS). The MTS consists of regionally important multimodal transportation facilities and services that are crucial to the mobility needs and economic vitality of the region and function as an integrated multimodal system to serve those needs (PSRC, 2001).

Multicounty framework and transportation policies presented in Destination 2030 are similar to those mentioned under VISION 2020 and the 1995 MTP. The Edmonds Crossing project would be consistent with these policies.

According to the Destination 2030 (Chapter 5, Implementation Guidance and Actions: Expanding Auto and Passenger Ferry Service), "Edmonds Terminal Relocation and Expansion" is identified as a "long-range planned investment" for the 2010 to 2018 time period (PSRC, 2001). The No Action Alternative would be inconsistent with the Destination 2030 plan and regional policies because it would not provide for the expansion or relocation of a transit-oriented, multimodal transportation system.

Snohomish County GMA Comprehensive Plan: Transportation Element

On June 18, 2001, the Snohomish County Council adopted proposed changes to the Transportation Element of the County's Comprehensive Plan ("Snohomish County GMA Comprehensive Plan Transportation Element Amendments," December 2000). The Snohomish County Department of Public Works (DPW), in collaboration with WSDOT, identified and recommended state transportation improvements that will serve and support the county's comprehensive land use plan. These amendments fulfill the requirements of House Bill 1497, passed in 1998, which requires counties to prepare and adopt a subelement dealing with state-owned transportation facilities. The proposed changes include planned transit centers, such as the proposed Edmonds Crossing project, in the vicinity of the Point Edwards site.

Snohomish County GMA Comprehensive Plan Transportation Element Amendments maintain the GMA comprehensive plan's consistency with the multi-county policies adopted by the PSRC and with the countywide planning policies for Snohomish County. On April 26, 2001, the PSRC certified that Snohomish County's amendments to its transportation element adequately conforms with the requirements of the GMA and are consistent with the policies and provisions of the 1995 MTP, as amended in 1996.

City of Edmonds Updated Comprehensive Plan: Land Use Policies

As described in Chapter 3, the City's comprehensive plan was updated in 2001 to respond to the goals and requirements of the GMA. The comprehensive plan serves as the basis for municipal policy regarding development and provides guiding principles and objectives for the development of regulations (City of Edmonds, 2001). Other goals of the plan are to encourage coordinated development and facilitate provision of public services. The Edmonds Crossing project area is located within an area designated by the comprehensive plan as the "Downtown/Waterfront Activity Center." Specific policies related to development within this activity center and applicable to the Edmonds Crossing Project are listed below:

A.1 Extend Downtown westward and connect it to the shoreline by positive mixed-use development as well as by convenient pedestrian routes.

A.3 Provide a more efficient transportation system featuring increased bus service, pedestrian and bicycle routes as well as adequate streets and parking areas.

A.8 Reroute auto traffic to minimize impact to residential neighborhoods.

The proposed project (either Modified Alternative 2 or Alternative 3) would be consistent with these policies because it would create a more efficient transportation system that integrates multiple modes of transit, provides additional off-street parking for travelers, and reduces current traffic congestion in downtown. This project would accommodate new development or redevelopment of areas within the project area targeted for future growth (e.g., the area between BNSFRR and SR 104).

The No Action Alternative (i.e., Alternative 1) would not be consistent with these policies because current traffic congestion in downtown Edmonds would remain (and probably increase), reducing the efficiency of the City's transportation system.

A.9 Establish a Point Edwards multimodal transportation center which provides convenient transportation connections for bus, ferry, rail, auto, and bicycle riders and makes Edmonds an integrated node in the regional transportation system. The new terminal should be planned to reduce negative impacts to downtown Edmonds while providing the community with unique transportation resources and an economic stimulus to the larger community.

Although the project as a whole would promote Edmonds as a node in the regional transportation system, as well as reduce local traffic congestion, the Mid-Waterfront Alternative would not establish the proposed multimodal center at the preferred Point Edwards site.

Edmonds Shorelines Master Program

As discussed in Chapter 3, the Edmonds Shorelines Master Program (SMP) provides for the use, protection, restoration, and preservation of the City's shorelines and associated wetlands. Within the project area, the SMP regulates land use within 200 feet landward of the MHHW line of Puget Sound, and uses of waters between the MHHW line and the outer harbor line. It also applies to the Edmonds Marsh and the historically contiguous wetland lying east of the marsh across SR 104. This section discusses relevant policies and use regulations of the SMP and the consistency of the Edmonds Crossing project with those policies and regulations.

The SMP presents goals and policies related to the following eight topics:

- Shoreline use
- Economic development
- Circulation
- Public access
- Recreation
- Conservation
- Historical/cultural
- Urban design

The following lists (in italics) the specific policies relevant to the Edmonds Crossing project and discusses how they are relevant to the project:

- *Reserve shoreline and water areas particularly suited for specific and appropriate uses, especially water-dependent and water-oriented uses, for such use.*

- *Public waterborne transportation linked to public and private forms of ground transportation should be encouraged to minimize auto usage.*

- *All transportation planning should be coordinated to provide efficient use and transfer between modes while minimizing the adverse environmental impacts of such facilities.*

The proposed ferry terminal is clearly a water-dependent use. The concept of creating a multimodal transportation center in conjunction with the relocated ferry terminal is intended to (1) facilitate the easy movement of passengers between ferry, rail, bus, auto, bicycle, and pedestrian modes, (2) eliminate existing conflicts between the modes that now pose risks to public safety, and (3) reduce auto usage by making alternative modes more convenient to use.

- *Encourage restoration of shoreline areas and rehabilitation of "natural systems" that have been degraded or diminished in ecological value or function.*

- *The City should work to maintain environmentally sensitive and critical areas, such as Edmonds Marsh.*

- *Where practicable, steps should be taken to enhance the shoreline area as a spawning ground for salmon and other species of fish and aquatic marine life.*

Modified Alternative 2 performs particularly well in meeting these policies. The proposed "daylighting" of portions of Willow Creek, the reduced length of the culvert, and an improved outlet to Puget Sound would result in a substantial improvement in salmon passage and improvement in habitat quality for salmonids. In addition, Modified Alternative 2 would avoid any direct impacts to Edmonds Marsh. Alternative 3 at the Mid-Waterfront site would involve the loss of a thin fringe of wetland vegetation along the western edge of Edmonds Marsh; this impact, however, is not expected to result in any substantial loss or degradation of the marsh's functional value.

- *Support and enhance public access to the shoreline and the use of public tidelands and beaches.*

Both build alternatives would provide public access to Puget Sound via existing parks. The Point Edwards Alternative would likely improve access to and visibility of Marina Beach Park. Removal of the UNOCAL pier would make the informally used property south of the UNOCAL pier more accessible. Even though the Mid-Waterfront Alternative would allow waterfront access, it would remove part of the existing Olympic Beach Park, thereby reducing both physical and visual public access from the central waterfront area.

- *Shoreline uses should be compatible with its site, in harmony with adjacent uses, and consistent with long-range comprehensive planning for waterfront use.*

Proposed development at the Point Edwards site, as part of Modified Alternative 2, would enable the City of Edmonds to meet one of the key objectives of the Edmonds Downtown/Waterfront Plan—integration of the downtown core with the waterfront and improvement of public access to the shoreline. While Alternative 3

would also help to achieve this objective, a multimodal center at the Mid-Waterfront site would create more of a physical barrier to the desired integration than the more distant Point Edwards site.

- *The City should use street ends within the shoreline area as a means of providing additional safe public access to shoreline areas and public recreational amenities.*

Even though the wooden trestle portion of the existing Main Street ferry terminal would be removed as part of this project, the concrete abutment would remain. It would be redeveloped as a public recreational facility connecting Brackett's Landing North and Brackett's Landing South.

- *Large or intensive developments within the shoreline area should provide some public recreation amenities.*

- *Projects should be encouraged to provide "street furniture," public art, related interpretative signage, landscaping, and other amenities.*

The proposed "daylighting" of Willow Creek would provide a recreational and educational amenity within the multimodal center. Interpretative signage along the stream would be used to allow both the commuters at the center (including waiting ferry riders) and recreationists at Marina Beach Park to enjoy and more fully appreciate the spectacle of migrating salmon and other aquatic life. As noted above, removing the UNOCAL pier would improve the public's access to the informal recreation area south of the pier. The multimodal center would also include extensive landscaping with native species.

- *Edmonds Marsh should be preserved for its educational and scientific value.*

The impacts to Edmonds Marsh would be minimal under either build alternative. Modified Alternative 2 would have no direct impacts and minimal impacts to the established buffer around the marsh as a result of locating the terminal access road as far away as practicable.

In addition to policies, the SMP also provides more specific use regulations that apply to each of the shoreline environments. Both alternative sites would be within the Urban Mixed Use II environment (although the proposed ferry pier at the Mid-Waterfront site would straddle the boundary with the Urban Mixed Use I environment). Both Urban Mixed Use environments would allow ferry terminals through a Shoreline Conditional Use Permit; roads, breakwaters, mixed-use commercial development, and other facilities proposed as part of the multimodal transportation center would be allowed through a Shoreline Substantial Development Permit.

Edmonds Downtown/Waterfront Plan

During development of the *Edmonds Downtown/Waterfront Plan*, a series of public meetings/workshops was held to identify goals and objectives, which were used to develop an overall urban design concept that outlines specific physical actions for

implementing the plan. This plan's goals, objectives, and urban design concepts applicable to the proposed project are listed below.

Goal A: Utilize/Improve/Integrate Waterfront and Port Facilities as Public Access

A-1 Provide more waterfront/beach access with managed, well-defined public access permits, especially between existing ferry dock and marina.

A-4 There should be clear pedestrian access from the town to the Marina with improved sidewalks and other pedestrian amenities along Railroad Avenue and Admiral Way.

Both the No Action and Point Edwards Alternatives would be consistent with these objectives because they would permit development of a continuous pedestrian esplanade connecting existing parks along the Edmonds shoreline. Construction of the proposed ferry holding and egress lanes under the Mid-Waterfront Alternative would restrict any pedestrian connections between the waterfront areas north and south of Dayton Street (i.e., between downtown and the Port); pedestrian access between those areas would be limited to the Dayton Avenue/Admiral Way underpass, unless an at-grade or overhead crossing were provided across the ferry lanes.

Goal B: Create Integrated System of Parks, Trails and Open Space

B-3 Connection of existing parks (along waterfront) to expand and encourage more parks (recreation activities downtown).

See the discussions for objectives A-1 and A-4 above. In addition, the project would result in the loss of existing waterfront recreation areas. Modified Alternative 2 would affect the use of the north end of Marina Beach Park. The ferry pier structure for Modified Alternative 2 would cross over Marina Beach Park, shading approximately 1.2 acres but not precluding their use. The benefit of locating the pier at the north end of the park would be the creation of one expansive recreation area rather than one divided in two by a pier. A contiguous park would make unobstructed views of Puget Sound and the Olympic Mountains south and west from the park possible. The pedestrian connection from the marina to the park would not be affected. Alternative 3 would remove approximately 0.3 acre of Olympic Beach Park upland.

Goal C: Protect Edmonds' Natural Environmental Quality

C-1 Use shoreline resources to tie community to water and provide better shoreline access.

C-2 Protect sensitive/critical areas and natural systems such as wetlands and dense stands of trees and shorelines.

The proposed project (i.e., either build alternative) would improve access (to varying degrees) between downtown Edmonds and the waterfront. By eliminating current traffic congestion along the downtown SR 104 corridor, both build

alternatives would promote community interaction and access to a large portion of the Edmonds shoreline. However, Mid-Waterfront would preclude waterfront pedestrian access to facilities in the southern portion of the project area because of construction of ferry holding and egress lanes across Dayton Street. The proposed project would be designed to protect sensitive areas, such as the Edmonds Marsh and shoreline, to the greatest extent feasible (see also Section 4.9, Vegetation, Fish, and Wildlife).

Under the No Action Alternative, degraded traffic conditions at and around the existing ferry terminal would continue to impede shoreline access from downtown Edmonds. This alternative would not affect the Edmonds Marsh, but would have an effect on marine resources around the existing ferry pier; these effects were the subject of a separate environmental review conducted by WSDOT as part of the overhead loading facility at the existing ferry terminal.

Goal E: Enhance Edmonds' Visual Identity

E-3 Emphasize the town's waterfront orientation.

E-6 Find a solution which visually and physically improves and/or halts the ferry holding lanes and traffic from impeding on the downtown/waterfront area.

Under both build alternatives, the project's proposed multimodal transportation center would focus current and future transportation needs into a compact area segregated from the downtown core, therefore improving both visual and physical access across SR 104 between the downtown and waterfront areas.

Point Edwards would result in the greatest improvement to visual and physical access between downtown Edmonds and the waterfront, as well as enhancement of this community's waterfront orientation, by rerouting ferry traffic outside of the downtown core. Under the Mid-Waterfront Alternative, the proposed ferry holding and egress lanes would create a barrier between downtown and waterfront facilities in the southern half of the project area (i.e., Port of Edmonds, Marina Beach Park).

The ferry traffic and terminal conflicts that would continue under the No Build alternative would further impede visual and physical access between the downtown and waterfront, thereby de-emphasizing the community's waterfront orientation.

Goal F: Improve Traffic Conditions for Local Community

F-1 Manage the ferry traffic and parking more efficiently and effectively.

F-2 Improve safety for pedestrians, bicyclists and motorists.

The proposed project, especially Modified Alternative 2, would greatly improve ferry traffic circulation and alleviate traffic congestion in the downtown and waterfront areas. The project's grade separation between the BNSFRR and proposed ferry holding lanes would also improve safety for pedestrians, bicyclists, and motorists in the project area.

Construction of a covered pedestrian overhead-loading facility at the existing terminal has partially improved ferry traveler safety by segregating pedestrians and bicyclists from automobile traffic. However, the No Action Alternative would not eliminate current safety concerns regarding at-grade conflicts between ferry and rail operations. In addition, the No Action Alternative would not improve management of ferry traffic or parking.

Goal G: Improve and Encourage Economic Development Opportunities

G-1 Maintain and encourage local business ownership.

G-2 Encourage small locally owned businesses and cottage industries.

With implementation of the Preferred Alternative, it is expected that business activity would eventually result in improved vehicular access to the waterfront beaches. With the improved accessibility, the waterfront area could potentially become a destination point for tourists and shoppers that could serve to stimulate local economic activity and encourage new businesses to develop and locate in the area. In addition, Main Street could become a more attractive pedestrian link between downtown and the waterfront, resulting in new customers to local businesses along this route from increased foot traffic. Implementing Alternative 3 would not result in substantial change as the local share of traffic circulation is expected to remain relatively the same.

Under the No Build alternative, it is anticipated that local restaurant business would be maintained. Additionally, the existing traffic congestion along the ferry holding area could indirectly discourage future development of other businesses in the vicinity of the existing terminal.

Goal H: Utilize UNOCAL Property to its Best Community Potential

H-3 *Integrate uses of WSDOT if chosen as the new ferry dock location.*

The proposed Point Edwards Alternative would be the only project alternative consistent with this objective. UNOCAL is in the process of cleaning up its property. Interim clean-up and planning long-term clean-up of the lower yard will resume in 2004. Clean-up of the upper yard was completed in October 2003. Subsequently, Triad Development Company has begun construction of an upscale, multifamily project on the hillside.

Urban Design Concepts

1. *Improve public access to the shoreline and link waterfront features by establishing a continuous esplanade along the shoreline.*

2. *Create an integrated system of parks and trails by . . . establishing safe pedestrian connections from the shoreline to downtown at Dayton Street, Main Street, and an overpass located between the two.*

See the discussion for objectives A-1 and A-4, above.

4. *Expand on the sense of community by removing intrusive ferry traffic from the core, providing several options for an expanded Senior Center, constructing an elevated plaza for public celebrations, and establishing a public pier for boaters and foot ferries as a waterside gateway.*

6. *Improve traffic conditions by removing ferry traffic impacts from the downtown core.*

The build alternatives (i.e., Alternatives 2 and 3) would improve local traffic conditions by redirecting ferry traffic away from the downtown core. These alternatives could also indirectly facilitate implementation of planned projects and programs such as redevelopment of the existing ferry dock as a public pier.

Under the No Build alternative, ferry traffic would remain concentrated in the downtown core (i.e., Main Street, Dayton Street, etc.), thereby possibly discouraging redevelopment opportunities around the existing ferry holding lanes (see also discussion for objectives G-1 and G-2).

7. *Improve and encourage economic development opportunities by. . . enhancement of redevelopment opportunities around the existing ferry holding lanes, the creation of a convenient "parking reservoir" and the enhancement of Edmonds as a water-oriented destination.*

See the discussion under objectives E-3/E-6 and G-1/G-2, above.

8. *Utilize the Point Edwards site to its best community potential by developing a multimodal transit center with compatible development uplands.*

See the discussion under objective H-3, above.

Port of Edmonds Strategic Plan and Master Plan

In January 2001, the Port Commissioners adopted a new strategic plan for the Port of Edmonds operations and property development. The *Port of Edmonds Strategic Plan 2001* provides an overview of the future plans for the Port of Edmonds from 2001 to 2012 (Port of Edmonds, 2001). The Port of Edmonds mission is to stimulate the economy of the Port District and to enhance the quality of life for District residents by providing excellent waterfront infrastructure and high-quality customer service. The plan articulates the Port of Edmonds' support for the project as follows:

- *The Port will continue to support the planning for the "Edmonds Crossing" multimodal project. Project leadership is with the City of Edmonds and Washington State Department of Transportation (WSDOT) Ferry System*

In 2001 the Port of Edmonds also adopted a new master plan (Port of Edmonds, May 2001). The plan lists guiding principles for its relationship with other sites. Guiding principles applicable to the Edmonds Crossing project are listed below:

- *The Port will work with other entities to make joint plans and implement actions that:*

  - *Recognize future plans of various outside agencies and capitalize on them, i.e., look for opportunities to provide shared parking; ways to protect Port and other waterfront properties access; ways to coordinate uses.*

  - *Capture the market energy that will be generated by the multimodal terminal and Sound Transit service, especially for tourist potential.*

  - *Decrease visual congestion, noise, odors, light and glare by development of adjacent properties.*

  - *Clean-up of the UNOCAL site and related Port sites.*

  - *Build public gathering spaces that support the understanding of transportation corridors and their technology.*

The Modified Point Edwards Alternative would not impair vehicular access to the Port of Edmonds Marina and would improve pedestrian access by providing bus service along Admiral Way. The pedestrian walkway from Admiral Way across the BNSFRR tracks would provide a connection between the marina and the multimodal center and would help the Port to capture the energy of the multimodal facility. The Modified Point Edwards Alternative ferry pier would increase visual congestion and noise at the south end of the marina; however, the pier would not prohibit the use of existing facilities at the marina. The elevated pier would pass near one of the marina's dry boat storage stacks and over its parking lot and another dry storage facility. The alternatives' pedestrian walkway would pass over the guest moorage slips at the southern end of the marina. The Modified Point Edwards Alternative would block the view from the southern end of the marina to the Puget Sound. Although the Point Edwards Alternative would have noise and visual quality impacts on the marina, it would not prohibit the use of any existing facilities on the development of any planned facilities like the Mid-Waterfront Alternative would. Despite this, the Port Commission has passed a resolution on March 10, 2003 in support of the Modified Point Edwards Alternative.

The Mid-Waterfront Alternative would restrict public access to Port facilities from Railroad Avenue in a manner inconsistent with the Master Plan because this street would terminate in a cul-de-sac at Dayton Avenue, and no direct pedestrian crossing over the proposed ferry holding lanes would be provided; however, pedestrian access would be provided via the Dayton Street/Admiral Way underpass. In addition, some boats could not be directly transported between the Port and downtown area (e.g., to the marine engine repair shop at Harbor Square) because of height restrictions through the proposed Dayton Street/Admiral Way underpass. This alternative would also displace Port-operated or leased boat storage facilities and surface parking. Reducing the Port's land holdings and limiting public access could indirectly and adversely affect the Port's economic vitality. The No Action Alternative could also fail to enhance public access to Port facilities because of projected increases in ferry traffic congestion along the SR 104 corridor.

Town of Woodway Comprehensive Plan

The *Town of Woodway Comprehensive Plan* was prepared in accordance with the GMA and originally adopted in June 1994. An updated version of the comprehensive plan was completed in 2000. Policies from the comprehensive plan applicable to the Edmonds Crossing project include the following:

Conservation Element

Air

C8 Keep Woodway wooded and free from industrial, commercial, or traffic generated air pollution.

C9 Keep streets narrow to discourage pass-through traffic, high speed traffic, or unnecessary commercial traffic.

Noise

C13 Keep streets narrow to discourage pass-through traffic and congestion.

Transportation Element

TP-4 Coordinate with other jurisdictions in the planning of regional transportation facilities.

TP-5 Minimize cut-through traffic on residential streets.

The key project issue identified by Woodway community leaders and citizens is traffic; namely, how to keep project traffic separate from Woodway traffic and from using Woodway streets on their way to and from the ferry terminal and multimodal center. Under the build alternatives, access to the new ferry terminal and transportation center would be designed to direct traffic to the realigned SR 104 route. The Pine Street entrance to the Town of Woodway would be controlled by a left-turn-only lane, thereby discouraging pass-through project traffic into this community.

The proposed project access road would be located near the backyard lot lines of five Woodway residences on Makah Road. Implementation of either build alternative would result in some increase in air and noise pollution to these residences generated by project traffic but these potential impacts during project operations are not considered substantial (see Section 4.2, Air Quality, and Section 4.3, Noise).

During the Concept Planning phase of the Edmonds Crossing project, a public involvement process was undertaken to involve and inform communities in Edmonds, Woodway, and Kitsap County. Woodway's community leaders have been involved from the beginning stages of the project in reviewing Edmonds Crossing preliminary design concepts for the reconfiguration of Pine Street. On March 3, 2003, the Woodway Town Council approved a resolution in support of the Modified Point Edwards Alternative.

Kitsap County Comprehensive Plan

The proposed Edmonds Crossing project would not generate increased ferry-related traffic in Kingston or the larger Kitsap County. Rather, any increase in traffic would be the result of increased ferry service, which will occur with or without the Edmonds Crossing project. The increase in the frequency of ferry service is necessary to serve planned growth and the development of urban communities in Kitsap County; this planned growth is consistent with what is envisioned and has been considered by the Kitsap County Comprehensive Plan.

4.11 Relocation

4.11.1 Studies and Coordination

The following discussion is based on the relocation discipline report (CH2M HILL, 1995), which is incorporated herein by reference and additional research conducted in 2002.

Study Methodology

Relocation impacts were estimated by overlaying the proposed project boundaries onto 1:400-scale aerial photographs of the project area. Estimates made by this process were then confirmed in the field. Information on regional, local, and neighborhood demographics was obtained from 2000 United States Census data, the *Port of Edmonds Master Plan 2001*, and the City of Edmonds *Comprehensive Plan* (2001). Information on business characteristics and economic activity in the project area was obtained from project area field work, which consisted of interviews of local realtors, property managers, and potentially displaced businesses, as well as detailed collections from published sources.

Coordination with Agencies and Other Groups

Demographic and business characteristic data from field work and reviewed documents, identified above, was confirmed and, in some cases, updated through personal contacts with agency staff and private individuals.

4.11.2 Impacts

Residential Impacts

The project's residential relocation impacts are characterized by number of homes or dwelling units for single-family and multifamily residences displaced.

Alternative 1: No Action

No project-related residential displacements would occur under this alternative.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

No residential displacements would occur with implementation of this alternative.

Phase 1

As with full buildout, no residential or business displacements would be anticipated as part of either phasing scenario.

Alternative 3: Mid-Waterfront Site

Full Buildout

The Mid-Waterfront Alternative would result in the displacement of three single-family residences in the Edmonds downtown/waterfront neighborhood. The three single-family homes are located on the waterfront adjacent to the Edmonds Bay Building in front of Olympic Beach Park. The homes, varying in size from 720 to 1,520 square feet, are situated on three identically-sized parcels, totaling 0.2 acre. In August 2001, the assessed value of the land was $147,000 per parcel. The assessed value of the homes varied from $34,600 to $57,100. These three homes are nonconforming uses in the City's Waterfront Commercial land use zone.

Although the City of Edmonds contains adequate housing stock to accommodate the numerically small housing demand created by the residential displacements anticipated under the Mid-Waterfront Alternative, the nature of the three single-family homes impacted is considered special. These three units are located on what is referred to as unobstructed waterfront property. There are no other similar properties within the City that have unobstructed (without roads or railroad tracks), direct access to a waterfront beach (Braun, pers. comm., 1997). The nearest area with single-family residential units having unobstructed waterfront property is in Richmond Beach, located approximately 2 miles south of downtown Edmonds. None of the remaining undeveloped land in the City of Edmonds designated for residential use is located within an unobstructed waterfront area. There are several condominium complexes located near the impacted housing units on unobstructed waterfront property that have similarly sized and priced units. The high demand and resulting infrequent vacancies in these complexes, however, would make them unlikely relocation housing for the displacees.

In accordance with FHWA guidance (FHWA, 1987), information on the age, minority, income, or disability status of specific residents and employees potentially displaced is not provided here to protect the privacy of the individuals concerned. The economic and social characteristics of residents in the project area as a whole are discussed in Section 4.12, Social.

Phase 1

Most of the properties required for the project's proposed facilities would be purchased during Phase 1. Property acquisitions during Phase 1 would result in the

displacement of three single-family residences in the Edmonds downtown/waterfront neighborhood (as described in the impacts for full buildout).

Business Impacts

Table 4-12 summarizes business displacement by type for each build alternative as well as for the No Action Alternative. Business type categories referenced in this table are retail, service (e.g., office), and restaurant. Table 4-13 identifies the number of displaced full- and part-time workers as July 2001.

Table 4-12
Business Displacements

Alternative	Retail	Service[a]	Restaurant
Alternative 1	0	0	0
Modified Alternative 2	0	0	0
Alternative 3	4	17	3

[a]*Service industries include the boat storage facilities located on Port of Edmonds property and the boat repair businesses located between Admiral Way and the BNSFRR right-of-way.*

Table 4-13
Employee Displacements[a]

Alternative	Full-Time	Part-Time
Alternative 1	0	0
Modified Alternative 2	0	0
Alternative 3	47	60

[a]*The number of employees displaced by Alternative 3 was based on the best available data from interviews with the affected businesses in July of 2001. For businesses which were unavailable for interviews, employee displacements were based on field reconnaissance on July 16, 2001 and best professional judgement.*

Alternative 1: No Action

No businesses would be displaced by the improvements proposed at the existing ferry terminal under the No Action Alternative.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

UNOCAL ceased fuel storage and distribution activities at the Point Edwards facility in 1991. Several existing buildings onsite are vacant; others are currently being used to house UNOCAL staff involved in the environmental cleanup of the property. As with the storage tanks on the hillside, all facilities will eventually be closed and removed as part of the cleanup activities. UNOCAL intends to sell the property prior to or following full cleanup. Because buildings on the property will be removed, UNOCAL employees will be transferred to other offsite facilities, and the property will be sold, UNOCAL is not considered a displaced business.

Alternative 3: Mid-Waterfront Site

Full Buildout

Construction of the multimodal terminal would displace the 48,600-square-foot commercial Sunset Avenue complex (the old Safeway complex) located in the northwest corner of the Sunset Avenue/Dayton Street intersection. Tenants in this commercial structure include three restaurant/food establishments, two retail stores, and seven service businesses (see Table 4-14). In July 2001, there were two vacant commercial units in the building. Based on July 2001 data, implementation of the Mid-Waterfront Alternative would result in the loss of approximately 33 full-time and 51 part-time employees at this site.

Table 4-14
Existing Businesses/Sunset Avenue Complex
Directly Impacted By Alternative 3 (Mid-Waterfront Site)

Business Name	Description	Business Type
For Lease	Old bar	N/A
Goodies Mini Mart	Food mart	Retail
Pizza Port	Pizza	Restaurant
Thai Park Restaurant	Thai food	Restaurant
Maytag Laundry/Dry Cleaning	Laundry mat	Service
ATA Black Belt Academy	Karate education.	Service
For Lease	Old bar	N/A
Waterfront Antique Mall[a]	Antiques	Retail
Ursa Foundation	Medical organization.	Service
Waterfront Physical Therapy	Sports physical therapy	Service
Crepe Cetera	Crepes	Restaurant
Scrub-A-Pup	Wash dogs	Service
Mike The Mover[b]	Movers	Service
A2000 Nails	Manicures	Service

[a]Antique dealers and consignment persons are not represented by this figure.
[b]12 total employees with fluctuating hours depending on available work.

Notes: This information is based on July 2001 data. As part of the additional outreach in 2003 associated with the Environmental Justice Analysis, it was found that the number and mix of businesses recorded in July 2001 had changed somewhat, as is reflected in the Environmental Justice Analysis (see Appendix G).

The existing Edmonds Amtrak rail passenger station is located adjacent to and west of the Sunset Avenue complex. The Amtrak train station would be displaced by the project. The train station would be replaced by a new station incorporated into the design of the proposed multimodal center.

Land acquisition to construct a portion of the ferry holding and egress lanes under the Mid-Waterfront Alternative would result in the direct loss of the 18,000-square-foot Edmonds Bay Building located at 51 Dayton Street. Businesses in this building include five service and two retail establishments. In July 2001, there were three vacant commercial units in this building (see Table 4-15)

Construction of the ferry access roadway would also displace four independent boat repair services, plus storage facilities, located on Port of Edmonds property between Admiral Way and the BNSFRR right-of-way. The Port of Edmonds Strategic and Master Plans mention recent and future investments aimed at serving these type of marine-related businesses. These investments include a pressure wash/water treatment area for boat cleaning and a 50-ton travelift which transports boats from the water across Admiral Way to the workyard.

Table 4-15
Existing Businesses/Edmonds Bay Building
Directly Impacted By Alternative 3 (Mid-Waterfront Site)

Business Name	Description	Business Type
For Lease	Office space	N/A
Content Works LLC	Media	Retail
For Lease	Office space	N/A
Camp Brotherhood	Family retreat	Service
Groeschell & Associates	Counseling	Service
Tom P. Conom: Attorney	Law attorney	Service
Wiggins Inc.	Contractor	Service
Insight International Inc.	Shipping	Service
MacFarlane Lumber Co.	Wholesale	Retail
For Lease	Office space	N/A

Notes: This information is based on July 2001 data. As part of the additional outreach in 2003 associated with the Environmental Justice Analysis, it was found that the number and mix of businesses recorded in July 2001 had changed somewhat, as is reflected in the Environmental Justice Analysis (see Appendix G).

Based on July 2001 data, implementation of the Mid-Waterfront Alternative would result in the total loss of at least 47 full-time and 60 part-time employees (see Table 4-13). Some permanent job loss in this neighborhood might be unavoidable, if displaced businesses cease operations or relocate to an area beyond the commuting distance of current employees. It is possible that some of the displaced businesses could relocate in the approximately 44,000 square feet of retail space that would be provided on the ground floor of the proposed parking garage of the multimodal center. As described above, under "Residential Impacts," information on the age, income, minority, or disability status of business owners and employees is not included here in the interest of those individuals' right to privacy.

Overall, the real estate market for the types of commercial space occupied by potential displaced businesses (e.g., office, retail, restaurants) is tight, suggesting that some businesses may find it difficult to relocate in the project area. It should be

noted, however, that by the time the project is constructed, the real estate market may have changed. For example, the types of development envisioned in the City's downtown/waterfront plan could provide opportunities to accommodate displaced businesses. Replacement of the Port's planned Marine Center office buildings would be limited to available Port property that is already programmed for other Port-related activities.

Phase 1

As noted above, most of the properties required for the project's proposed facilities would be acquired during Phase 1. Included in the Phase 1 property acquisitions would be the Edmonds Bay Building (18,000 square feet) and the area between Admiral Way and the BNSFRR right-of-way, including the four boat/yacht repair facilities mentioned previously.

The development of Phase 1 would not include the construction of the parking garage that would contain approximately 49,000 square feet of street-level commercial space. Therefore, this space would not be available as a potential site to relocate some of the displaced retail businesses once Phase 1 is completed. This situation may make it more difficult to relocate businesses within the city and near their current locations. The development of this additional retail space later in the project timeline would delay the ability for business activity in the new retail space to offset the loss in sales tax revenues as a result of Phase 1 displacements.

4.11.3 Mitigation Measures

Mitigation for project-related displacement of residents and businesses would consist of relocation assistance for displaced individuals to find and acquire or rent decent, safe, and sanitary housing or comparable business facilities. The acquisition and relocation program for the project would be conducted in accordance with the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act (URA) of 1970, as amended, and Washington State's Relocation Assistance—Real Property Acquisition Policy (RARPAP) (RCW 8.26).

It is the policy of FHWA and WSDOT that persons displaced as a result of programs designed to benefit the public as a whole shall be provided relocation assistance in a consistent manner. Individuals, families, and businesses displaced by the project would be eligible for relocation advisory services and compensation payments provided under URA and RCW 8.26. Under these regulations, all property owners would be paid the fair market value of real property acquired for project right-of-way. Other services offered include advisory services from a relocation specialist, payment of moving costs, and replacement housing payments, including purchase supplements, rental assistance, and down-payment assistance. Relocation resources are available to all residential and business relocatees without discrimination (see Appendix F for further details).

In specific regard to the three single-family units that would be displaced by the Mid-Waterfront Alternative, real estate research in August 2001 examined prices and recent sales of comparable houses and condominiums in Downtown Edmonds and the general vicinity. Because the need to find replacement housing for the three households would immediately follow property acquisition, relocation options were

focused on potential vacancies in the existing housing stock as opposed to the potential for new construction.

In August 2001, CH2M HILL conducted a search on the Advantage Real Estate Services, Inc. Internet site (made available by the Northwest Multiple Listing Service). CH2M HILL entered the same housing characteristics as mentioned above, including unobstructed waterfront access, a view of Puget Sound, and close proximity to downtown Edmonds. The replacement housing availability search should be interpreted as a "snapshot" of the current market, with the understanding that actual housing markets will likely change by the time of the relocation process.

Four condominium units and two houses between $185,000 and $285,000 were listed for sale, all within downtown Edmonds with the exception of one located further north near Picnic Point/Mukilteo. All of the listings were two bedrooms with one to two baths and included views of Puget Sound. None of the listings included unobstructed waterfront access, which makes such relocation alternatives incomparable to the potential displaced houses. The size of the homes listed in Edmonds were between 987 and 1,350 square feet. Additional research by CH2M HILL discovered a house near Richmond Beach, listed by John L. Scott Real Estate. Although the house was located near Richmond Beach, it had no view or direct access to the water. The 2,040-square-foot, four-bedroom house, built in 1959, was listed at $264,950. Darlene Dillan, a Windermere real estate agent based in Edmonds, was questioned about relocation possibilities in the Richmond Beach area. Ms. Dillan mentioned that any housing at Richmond Beach with views of the Sound or unobstructed waterfront access would cost between $500,000 to $1,000,000 dollars (Dillan, pers. comm., 2001).

If WSDOT, at the time it acquires real estate or rights to real estate, determines that there is insufficient replacement housing for displaced residents, it would commit funds authorized for this project to provide such housing by constructing, rehabilitating, purchasing, renting, or otherwise financing the acquisition of the necessary housing in a manner feasible for the individual situations. This commitment would be made only after all other options for providing relocation assistance have been exhausted.

4.12 Social

4.12.1 Studies and Coordination

The following discussion is based on the social discipline report (CH2M HILL, 1995), which is incorporated into this EIS by reference and additional research conducted in 2002 and 2003.

Studies Performed

Impacts of the project on community cohesion were assessed in two ways. First, the pattern of right-of-way and property acquisition for the proposed roadways (e.g., ferry holding lanes, transit access road) and multimodal center was considered to assess the extent of physical disruption (e.g., demolition of houses, street cutoffs)

that would be caused by each alternative. Second, the effects of each alternative on access to community facilities were examined.

Appendix G, Environmental Justice Analysis, addresses potential impacts to low-income and minority populations in the project area in accordance with Executive Order 12898 on Environmental Justice, and FHWA Order 6640.23 on Environmental Justice. The Environmental Justice Analysis concluded that it is very unlikely that the Edmonds Crossing Project would result in disproportionately high and adverse effects on minority and/or low-income populations.

To evaluate project impacts on public services, including utilities, appropriate local agencies and service providers were contacted to identify the boundaries of existing service areas and location of facilities within the affected project area.

Coordination with Agencies and Other Groups

Information from reviewed documents was confirmed and, in some cases, updated through personal contacts with agency staff and private individuals.

4.12.2 Impacts

Alternative 1: No Action

Community Cohesion

If the Edmonds Crossing project were not built, there would be no community cohesion impacts. However, depending on the economy's market forces, maintaining ferry operations at the existing terminal under the No Action Alternative could slow planned growth and development in the project area that would result from projected long-term increases in ferry traffic. Increased traffic congestion along SR 104 would reinforce this corridor as a barrier between downtown Edmonds and the waterfront by constraining access and restricting cohesive development patterns. This alternative would have the most severe impact on community cohesion.

Services and Utilities

No direct impacts on services or utilities would occur under this alternative; however, continued and increased traffic congestion on local streets in the downtown and waterfront areas could eventually impede the passage of emergency service vehicles and make access to local services less convenient. Without the project, the at-grade railroad crossings would also fail to provide uninterrupted emergency vehicle access to the waterfront.

Recreation

No direct impacts on recreation would occur under the No Build alternative.

Pedestrians and Bicycles

A critical improvement to ferry loading and unloading operations has occurred as a result of the pedestrian overhead-loading facility. This facility has enabled separation between walk-on and vehicular traffic, improving safety conditions and reducing the time for ferry loading and unloading by an estimated one-third of the time previously required.

The *City of Edmonds Bikeway and Walkway Plan* recommends that the existing walkway along Railroad Avenue between Main and Dayton Streets be relocated to Edmonds Way, as shown in Figure 4-13. If this recommendation is implemented, Edmonds Way and Main Street would provide the primary pedestrian access to the ferry terminal from the south. The increased ferry traffic and its impact on the Main Street/Railroad Avenue, Main Street/Edmonds Way, and Edmonds Way/Dayton Street intersection, however, will further complicate pedestrian access to the terminal.

The City of Edmonds adopted its 2000 Bikeway Comprehensive Plan as part of the Transportation Element of the City's Comprehensive Plan in April 2000. The 2000 Bikeway Comprehensive plan indicates that signage will be provided for bike routes along Railroad Avenue, Admiral Way, and Main Street in the waterfront vicinity during the 2000 to 2003 time period (Figure 4-14). From 2004 to 2006 a bikeway would be signed along Dayton Street from Railroad Avenue to 3rd Avenue South. Once signed, the Dayton Street bikeway to the waterfront would likely be the preferred route for bicyclists to and from the ferry terminal because of its separation from the majority of the ferry traffic. Until implementation, however, bicyclists, like pedestrians, would likely use the busy Edmonds Way/Main Street corridor.

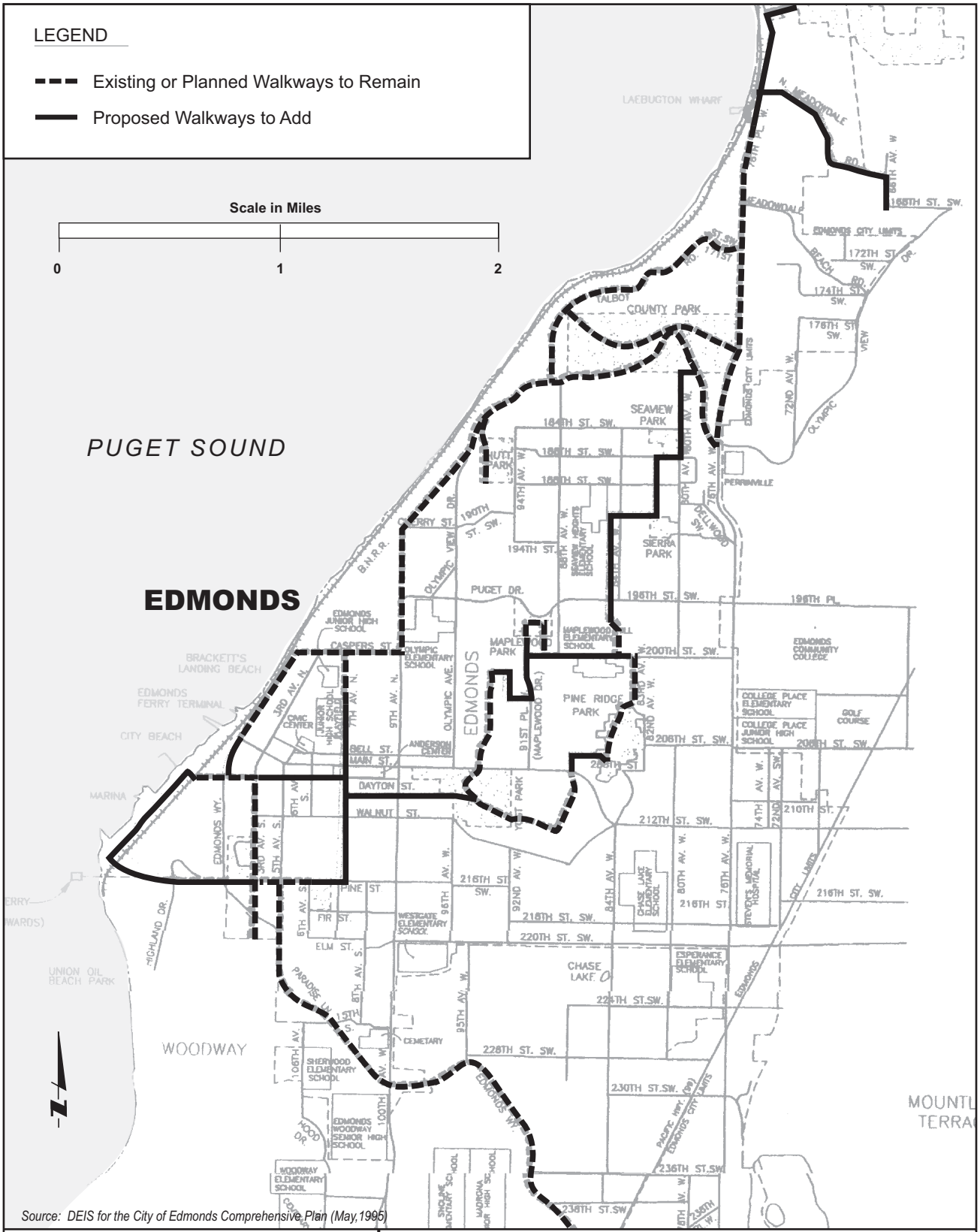
Impacts Common to Both Build Alternatives

Recreation—Recreational Fishing

Moving the ferry terminal and operations to either the Point Edwards or Mid-Waterfront site would have little impact to sport fishing activities. Salmon fishing offshore of the new terminal would be displaced from the new ferry lane. However, there would be more than enough room to fish in the vicinity of Point Edwards/Edmonds. Sport fishers are very mobile and can easily stay out of the way of ferries. As with tribal shrimp fishers, sport shrimp fishers would be generally displaced from the new ferry lane at either Point Edwards or Mid-Waterfront but would gain access to the area of the existing ferry lane. Judging from the pattern of sport fishing activity in 2002, this may be beneficial. Most of the sport pots were set in the vicinity of the existing ferry lane and to the north; far fewer were set to the south of the existing ferry lane, including Point Edwards.

Public Services

Schools: The project's only impact on schools would be the potential disruption of access for students living within a school's attendance boundaries. The only area where such impacts could occur are in the Northwest Woodway neighborhood. However, as described above, under "Community Cohesion," current access into



Source: DEIS for the City of Edmonds Comprehensive Plan (May,1995)

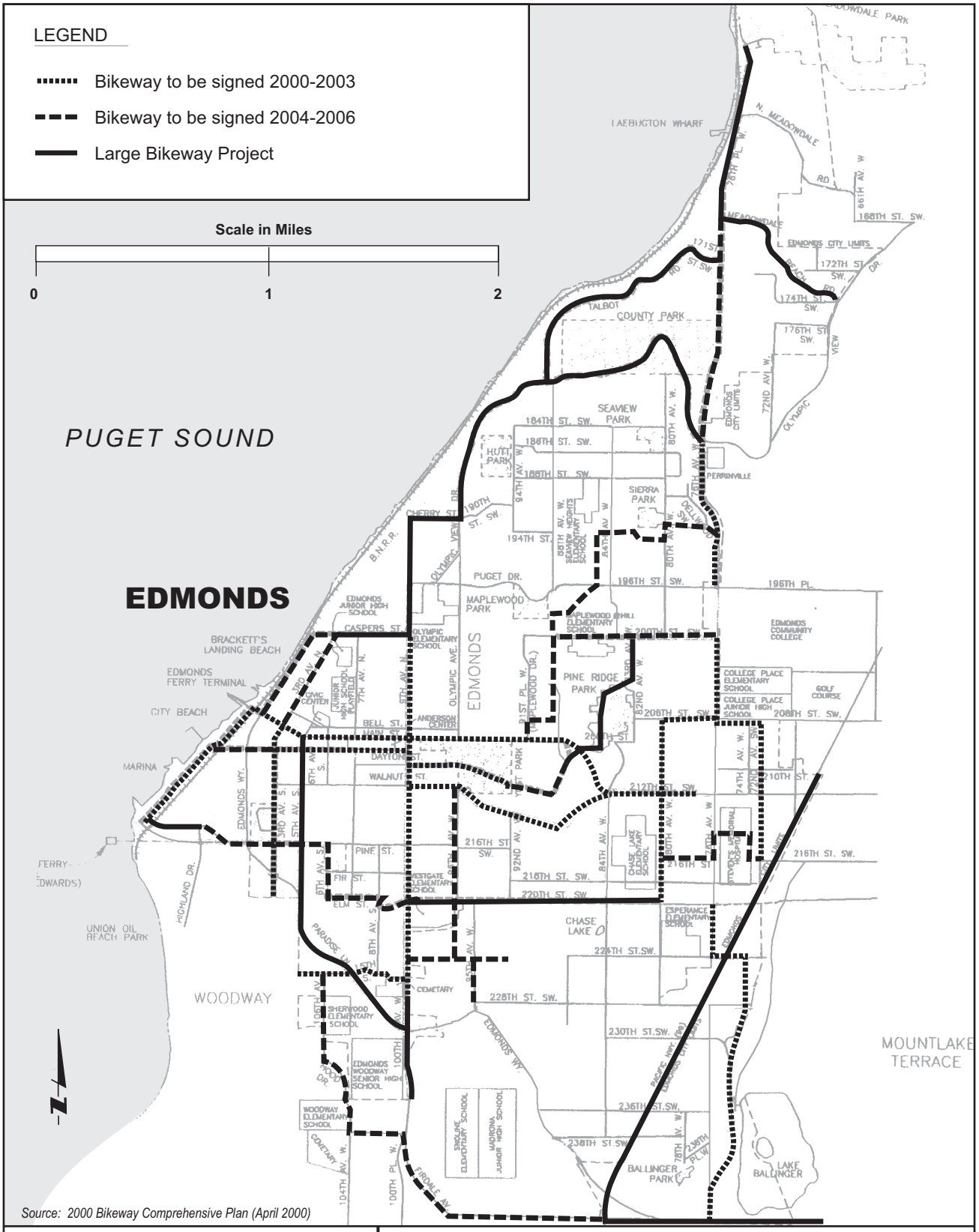
EDMONDS CROSSING

Connecting ferries, bus & rail

Figure 4-13

City of Edmonds Walkway Plan

154090.G1.07.A1_T092004007SEA • 4-13 Walkway Plan • 9/24/04 • dk.gm



EDMONDS CROSSING

Connecting ferries, bus & rail

Figure 4-14

City of Edmonds 2000 Bikeway Comprehensive Plan

154090.G1.07.A1_T092004009SEA • 4-9 Bikeway Plan • 9/24/04 • dk.gm

Northwest Woodway via Pine Street would not change as a result of this project. Therefore, the proposed project would not affect access to schools servicing this neighborhood.

Police Protection, Fire Protection, and Emergency Medical Services: It is not anticipated that project implementation under either of the two build alternatives would result in an increased demand for police, fire, or emergency medical services (i.e., additional staff or equipment). In general, both build alternatives would improve emergency access to the majority of the waterfront area by providing an above-grade crossing of the BNSFRR (Hickok, pers. comm., 1995). Point Edwards would have the least effect on emergency services because it is located in an underdeveloped area and there would be few access conflicts with existing development. However, delays in emergency response times and access to businesses and residences located on Railroad Avenue could occur under the Mid-Waterfront Alternative (Whitman, pers. comm., 1995).

Both of the build alternatives propose a longer pier than the existing ferry terminal (approximately 200 to 400 feet longer). Depending on the final design of the piers, and the piers' accessibility during a fire, fire trucks would either access a fire by maneuvering along the holding and/or exit lanes (as they do today), or a standpipe (a rigid fire hose) could be constructed along the length of the pier. The standpipe would have outlets approximately every 50 feet along the pier to which a fire fighter could attach a 200-foot flexible hose. In case of a fire, a fire truck would attach its hose to the end of the standpipe closest to the shore, and would attach its flexible hoses to the standpipe outlets (Westfall, pers. comm., 1996). By using the standpipe's outlets, the fire department's fire hoses would have an adequate length to fight fires along the entire length of the pier.

Solid Waste: The Edmonds Crossing project, under both build alternatives, would probably not result in a substantial increased demand for additional waste transportation services and landfill capacity. The only source of solid waste from this project would be from the proposed multimodal center. The Mid-Waterfront Alternative would replace existing commercial land uses that are currently contributing to the county's waste stream. Any additional wastes generated by the project would reduce existing capacity at Klickitat County's Hidden Valley Landfill; however, increased recycling efforts would help to lessen this impact (City of Edmonds, 1995).

Other Governmental Institutions and Services: The Point Edwards Alternative would impair the views of Puget Sound to the south of the Marina and increase noise; however, it would not prohibit the continuation of activities at the Port. The ferry pier and pedestrian walkway would pass high enough over the marina to allow the following activities to continue: boat operations or storage within the marina waterway, parking, dry stack boat storage, and use of the Marina Beach walkway. Implementation of the Mid-Waterfront Alternative would result in the loss of Port property currently used for boat storage, boat repair, as well as surface parking.

Religious and Cultural Institutions

There are no religious or cultural institutions within the neighborhoods potentially affected by the proposed project, so no direct impacts to religious or cultural institutions would occur under any of the alternatives.

Utilities

Water: Because the two build alternatives would replace existing commercial and former industrial land uses, it is not anticipated that the project would increase demands on the City's water supplies over historical usage. In addition, the City has entered into agreements with other water districts to ensure that there is an adequate water supply to service planned future growth, including the proposed project (City of Edmonds, 1995). The alternatives would not impact any Olympic View Water and Sewer District facilities.

Sanitary Sewer: Because the two build alternatives would replace existing commercial and former industrial developments, it is not anticipated that the project would increase sanitary sewer flows or increase demands on the City's WWTP capacity. Furthermore, it is expected that existing sewer infrastructure and facilities would have the capacity to accommodate the project's sewer needs. No facilities owned by the Olympic View Water and Sewer District would be impacted.

Stormwater: Because the majority of the facility at Mid-Waterfront would replace existing commercial development already covered with impervious surfaces (e.g., parking lots, roads, roofs), it is anticipated that the project would not substantially increase peak stormwater flows and therefore would not change existing runoff patterns. Furthermore, it is expected that existing stormwater facilities would have the capacity to accommodate the proposed project under this alternative (for more details, see Section 4.7, Water Quality).

Project implementation at Point Edwards would result in a small increase in peak stormwater flow; however, this increase could be detained in the site's existing detention pond, and any increased flow is not anticipated to have an adverse affect on the capacity of existing storm drainage facilities. Maximum use of existing infrastructure in the Point Edwards area would take advantage of tie-ins to the existing storm system (i.e., detention pond, ditches, pipes). This infrastructure should provide adequate drainage for the multimodal center and associated roadways (see Section 4.7, Water Quality).

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Community Cohesion

Point Edwards would have the least severe impact on community cohesion.

Full Buildout

The Point Edwards site would not bisect existing residential neighborhoods or cut off any through-streets. Furthermore, no acquisition of residential homes would be

required under this alternative. Current access into Northwest Woodway via Nootka Road and 216th Street NW would not change as a result of this project, and Woodway Park Road would remain a convenient alternative access route into this neighborhood. Therefore, the proposed project would not affect access to community facilities and services outside the Northwest Woodway neighborhood.

This alternative would reroute current ferry traffic away from the existing SR 104 corridor, thereby improving access and circulation on major arterials and local streets in the project area and strengthening the cohesion between downtown and waterfront areas. This alternative would also be consistent with the City's overall strategy for redevelopment of the downtown/waterfront area, as envisioned in the *Edmonds Downtown/Waterfront Plan* (see Section 4.10, Land Use, for a discussion of project consistency with local plans and policies).

Phase 1

Most of the property required for the project's facilities would be acquired during Phase 1, although only a portion of the acreage acquired would be converted to roadway and/or terminal-related facilities during Phase 1. No residential relocation impacts would occur under Phase 1 or full buildout.

Recreation

Full Buildout

Under the Point Edwards Alternative, the ferry pier would straddle the boundary between Marina Beach Park and the Port of Edmonds Marina. The footprint of the pier structure would require the acquisition of a roughly 50-foot-wide strip along the northern edge of the park. The pier would cover a total of 0.42 acre of the formal park (parking lot and grass play area). The pier structure would be high enough above ground level to allow for continued use of the park beneath. A small portion of the grassy area (0.1 acre) covered by the pier structure extends northward beyond the formal park boundary into Port property. A turnaround proposed at the south end of Admiral Way would extend slightly into the eastern corner of the grassy area and the adjacent parking lot; approximately 0.05 acre would be acquired to accommodate this facility. The pier structure would extend westward from the grassy play area to the shoreline and the ferry terminal, a distance of roughly 500 feet. The pier would cover approximately 0.69 acres of tidelands (west of the Inner Harbor Line) owned by the State DNR and leased by the City of Edmonds as an informal extension of Marina Beach Park.

Marina Beach Park would also experience a number of indirect, or proximity, impacts including increased activity in the vicinity of the park and increased noise and ambient CO levels. In contrast, several potential positive impacts could also result, including improved views to the south and west from the park toward Puget Sound and the opportunity to create a more extensive facility that would integrate the existing park with the informal recreation area south of the UNOCAL pier.

More detail concerning the anticipated impacts on recreational facilities and potential avoidance measures is provided in Chapter 6, Section 4(f).

Phase 1

The impact to Marina Beach Park would occur during Phase 1.

Pedestrians and Bicycles

Full Buildout

The Point Edwards Alternative would conform with ADA access standards, including elevators to accommodate level changes. Similarly, signage and information systems would comply with ADA requirements.

It is anticipated that most pedestrians destined for the ferry pier or the multimodal center would be dropped off at the center. From the center, ferry-bound pedestrians would use a covered walkway to get to a passenger waiting area located overhead at the end of the pier. From this waiting area, walk-on passengers would board the ferry via overhead walkways.

Separate 6-foot-wide corridors would be provided along both sides of the ferry access road (realigned SR 104) to accommodate pedestrians and bicyclists. The 1994 *City of Edmonds Bikeway and Walkway Plan* and the *City of Edmonds 2000 Bikeway Comprehensive Plan* address bicycle facilities in the Point Edwards project area. The 1994 Bikeway and Walkway Plan proposes a combined walkway/bikeway along the north side of the ferry access road, while the 2000 Bikeway Plan proposes installing signage and replacing grates on 216th Street for a bikeway, and potentially extending the bikeway through the UNOCAL property to Marina Beach Park. As described below, the Point Edwards Alternative would provide more accommodations for pedestrians and bicyclists than currently envisioned in City plans. By separating ferry-bound pedestrians and bicyclists, the Point Edwards Alternative would will increase safety and enhance ferry loading and unloading operations. In addition, providing a separate southside corridor for bicyclists leaving the ferry would simplify their integration into the SR 104 intersections at the Woodway access road and at Pine Street. It is possible that the northside bicycle corridor, between the multimodal center and the ferry, could be shared by the bicyclists on their way to the ferry and waiting vehicle passengers taking in the scenery and activities along the shoreline. The interaction between meandering pedestrians and riding bicyclists could result in occasional unsafe conditions. The danger of possible injury would be reduced by signing along the corridor, warning of the possible shared nature of the facility.

The opportunity for ferry bicyclists to transfer to Community Transit bike-rack-equipped buses would be slightly inconvenient at Point Edwards, requiring bicyclists to use the multimodal center elevator to transition elevations.

The distance between a ferry terminal at Point Edwards and downtown Edmonds would be roughly three times longer than the distance between the existing ferry terminal and downtown. This much greater distance and the perceived inconvenience would likely limit the number of pedestrians who would walk between the terminal and downtown.

Phase 1

Six-foot-wide bicycle corridors would be provided along both sides of the ferry access road during Phase 1. As a result, the impacts during Phase 1 would be similar to those described under full buildout.

Alternative 3: Mid-Waterfront Site

Community Cohesion and Services

Full Buildout

Impacts on community cohesion and services in the Northwest Woodway neighborhood would be similar to those described for Point Edwards. Mid-Waterfront would have a greater effect on the Edmonds downtown/waterfront neighborhood.

Under the Mid-Waterfront Alternative three single-family homes would be removed along the waterfront. Removal of the single-family homes would eliminate the only detached housing units in the neighborhood. However, these affected units are non-conforming uses within the City's waterfront commercial land use zone, and their removal is not expected to constitute a severe impact on this neighborhood's social cohesion.

To facilitate traffic movement along Dayton Street and access to the Port of Edmonds and other waterfront uses, Dayton Street would be reconstructed to pass under the railroad tracks and ferry staging/egress roadway and would connect to a realigned Admiral Way. Only one neighborhood street, Railroad Avenue, would be terminated in a cul-de-sac as a result of this component of the Mid-Waterfront Alternative. Railroad Avenue provides access to two multifamily apartment buildings, the South County Senior Center, and one office/restaurant complex.

Access to services, like the South County Community Senior Center, would also still be possible via Main Street but would be more circuitous. Residents of the area north of the proposed pier would find it more difficult to access Marina Beach Park and other recreational facilities, as well as restaurants and other businesses on the Port of Edmonds property. In addition, provision of police, fire, and emergency medical services to residents and businesses along Railroad Avenue could be impeded by increased traffic congestion along this route. Relocation of the existing ferry terminal under this alternative would reduce traffic congestion along the SR 104 corridor and therefore would improve, to some degree, access and community cohesion between the Edmonds downtown/waterfront neighborhood and the greater downtown area. However, the overall effect of the project would be to divide this waterfront neighborhood into two relatively isolated areas.

Phase 1

Most of the property required for the project’s facilities would be acquired during Phase 1, although only a portion of the acreage acquired would be converted to roadway and/or terminal-related facilities during Phase 1. Residential relocation

impacts would occur under Phase 1. Because of the more limited facilities proposed as part of Phase 1, the Phase 1 project would be less likely to stimulate as much development, and thus social change, in the vicinity of the project as envisioned under full buildout.

The most critical impact associated with the phasing of the Mid-Waterfront Alternative would be the change in accessibility to the Port of Edmonds and other waterfront businesses and recreational facilities along Admiral Way. During Phase 1, the only access to the waterfront would be via the secondary route from realigned SR 104 (ferry access lane). Traffic traveling to the area would use the HOV/bypass lane on the realigned SR 104 and would turn left immediately south of the toll booths onto Admiral Way. While this access route would be clearly marked with appropriate signage to minimize any effects until the Dayton Street underpass would be constructed as part of full buildout, its circuitous nature could negatively affect emergency vehicle access, and resulting response times. In addition, the route may discourage some members of the public to travel to the Port, businesses, and recreation facilities along the waterfront.

Recreation

The Mid-Waterfront Alternative would require the acquisition of approximately 0.3 acre of upland and 1.2 acre of tidelands from Olympic Beach Park for the ferry pier approach roadway and pier. This alternative would, in effect, bisect the park, creating a 0.4-acre southern section and 0.25-acre northern section. Access from one side of the park to the other would have to be accomplished via an at-grade crossing of, or an elevated structure over, the ferry holding lanes. A large area of the existing parking lot that serves the park and nearby businesses would be displaced by the multimodal center. Increased noise and ambient CO levels, along with impacts of views from the park, would diminish the park's present values. The presence of the ferry terminal nearby and the force of the ferry propellers could result in diminished fishing activity at the public fishing pier and possible damage to the pier itself.

More detail concerning the anticipated impacts on recreational facilities and potential avoidance measures is provided in Chapter 6, Section 4(f).

Phase 1

The impact to Olympic Beach Park would occur during Phase 1.

Pedestrians and Bicycles

Full Buildout

Mid-Waterfront would conform with ADA access standards, including elevators to accommodate level changes. Similarly, signage and information systems would comply with ADA requirements.

Pedestrian and bicycle access to the ferry pier and multimodal center would be along Dayton Street. Because most of the ferry traffic would be diverted away from Edmonds Way, pedestrian movement between the downtown and the waterfront

areas would experience fewer conflicts with ferry traffic. Diversion of some traffic destined for the Port of Edmonds via the ferry access road would further reduce pedestrian/vehicular conflicts.

Pedestrians destined for the ferry would walk along an overhead pedestrian walkway leading to a pedestrian ferry-loading structure that would be grade-separated from the vehicle loading pier. Others could easily walk to the rail platform or bus terminal.

Pedestrian and bicycle access along Dayton Avenue to the Port of Edmonds Marina and Marina Beach Park would be through the proposed Dayton Street underpass. The existing walkway in the area would be placed in the underpass; depending on the final geometrics of the underpass, the bike lane proposed by the City along that section of Dayton Street may be accommodated or may need to be physically linked with the walkway in the underpass. The underpass would certainly be a less preferred route for pedestrians and bicyclists than the current surface street and may create safety concerns among some individuals.

The Mid-Waterfront Alternative would also create circuitous pedestrian/bicycle circulation along the waterfront in contrast to the more continuous system envisioned in the *City of Edmonds Bikeway and Walkway Plan and 2000 Bikeway Comprehensive Plan* (Figures 4-13 and 4-14). The existing walkway along the west side of Railroad Avenue between Main and Dayton Streets is already proposed by the City to be relocated to Edmonds Way. Railroad Avenue would end in a cul-de-sac just north of Dayton Avenue, affecting the constructibility of the proposed continuous bike path along Railroad Avenue. The linkage of that proposed bike path to the proposed bike route along Admiral Way between Dayton Street and Marina Beach Park would also be problematic; as the elevated walkway to the ferry pier, the Dayton Street underpass, and the at-grade ferry access road would all converge at the same location. These structures and roadways would create an impediment to the linkage between the downtown and northern waterfront area and the Port marina and park. Finally, the proposed realignment of Admiral Way away from the marina and closer to the ferry access roadway and railroad tracks would make any future walkway/bike route along Admiral Way less desirable for use.

The Mid-Waterfront Alternative would be located slightly farther from downtown Edmonds than under existing conditions but much closer than the Point Edwards Alternative. The relative proximity to downtown and to waterfront attractions would likely result in much more pedestrian activity in the area and to and from the ferry.

Phase 1

Because Dayton Avenue would terminate in a cul-de-sac immediately east of the BNSFRR tracks, and because of the at-grade ferry access road immediately west of the BNSFRR tracks, pedestrian and bicycle access to waterfront uses along Admiral Way would be circuitous and inconvenient. As with vehicles, bicyclists could access the area via the westbound ferry access roadway HOV/bypass lane.

Regional and Community Growth

In and of itself, the Edmonds Crossing project would not constitute a direct cause of growth in the Edmonds and Woodway communities or the region. The project provides a critical and long-needed solution to alleviate traffic problems on project-area surface streets, to reduce conflicts and to improve safety between ferry and rail operations along the waterfront, and to direct development in accordance with the City's planning objectives.

The City's comprehensive plan identifies the project area as part of the "Downtown/Waterfront Activity Center;" this area would be the primary center for commercial, governmental, and cultural activities, with substantial growth in employment. One of the key elements of the *Edmonds Downtown/Waterfront Plan* is relocation of the existing ferry terminal. According to this plan, the project would help to integrate the downtown core with the waterfront, improve shoreline pedestrian access and traffic circulation, and encourage mixed-use development (City of Edmonds, 1994).

To the extent that future developments are predicted to occur in the downtown/ waterfront area, the project would both support and promote the anticipated growth. However, because of the complex and unquantifiable relationship between transportation and land use, the project's impacts on growth are difficult to predict with any accuracy. Overall, it is not anticipated that growth in the project area would result in major changes in population characteristics.

4.12.3 Mitigation Measures

Community Cohesion

Alternative 1: No Action

None of the potential impacts on community cohesion directly associated with construction of the new roadways and the multimodal center would occur under the No Action Alternative. The No Action Alternative inherently continues to result in a physical and activity barrier separating the waterfront from downtown with both the railroad at-grade crossings and the ferry traffic and staging area contributing to this barrier. No mitigation measures appear to offer any promise to address this inherent impact.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

The Point Edwards Alternative would not bisect existing residential neighborhoods, would not acquire residential housing, nor would it cut through existing streets. The relocation of ferry and traffic away from downtown and the grade separation of the ferry and Port traffic crossing of the railroad tracks under the Point Edwards Alternative should provide beneficial community cohesion impacts.

Alternative 3: Mid-Waterfront Site

The Mid-Waterfront Alternative would have adverse effects on community cohesion. The adverse effects of this alternative on community cohesion would be difficult to mitigate. Measures that WSDOT would consider if the Mid-Waterfront Alternative were selected include the following:

- Provide an at-grade or elevated pedestrian/bicycle crossing of the ferry holding/egress lanes in order to connect the waterfront areas north and south of Dayton Street (see "Pedestrian and Bicycles," below, for further discussion of this specific measure).

- WSDOT would coordinate with community service providers (e.g., police, fire departments, South County Senior Center) to solve any possible access issues caused by the Railroad Avenue cutoff from Dayton Street.

Regional and Community Growth

Because the regional and community growth facilitated by the Edmonds Crossing project would be consistent with local and area-wide plans and policies, no mitigation is required (see Section 4.10, Land Use).

Recreation

Under both build alternatives, acquired parkland would be replaced with property of equal fair market values and recreational utility.

In the case of the Modified Point Edwards Alternative, replacement land would be found in the informal recreational area south of Marina Beach Park. Also in regard to the Preferred Alternative, the replacement land would be integrated with the existing park. Interpretive signs would be installed within the larger park and along the daylighted sections of Willow Creek. The signs would describe the cultural history of the site, specifically tribes' traditional use of the area; natural resource features, possibly including tribes' traditional uses of native plants still growing in the area; and the role of the creek in salmon survival.

The severed portions of Olympic Beach Park would be reconstructed by means of an at-grade crossing of, or an elevated structure over, the ferry holding lanes.

Services

Social Institutions

Because Railroad Avenue would still provide direct access to the South County Senior Center via Main Street under the Mid-Waterfront Alternative, no specific measures to mitigate the change in access is proposed.

Police, Fire, and Emergency Medical Services

Under the Mid-Waterfront Alternative, WSDOT would coordinate with the Edmonds police and fire departments on the development of access plans for emergency services in areas where street access is changed by the project (i.e., Railroad Avenue). If the Railroad Avenue cutoff from Dayton Street results in excessively circuitous access to this neighborhood that could substantially hinder the progress of emergency vehicles, WSDOT would investigate possibilities for providing alternative access.

Solid Waste

WSDOT would encourage provision of on-site recycling programs and on-site collection programs at the multimodal center for recyclable materials such as paper, cardboard, and glass.

Other Governmental Institutions and Services

Under the Mid-Waterfront Alternative, Port of Edmonds boat storage and repair facilities located between Admiral Way and the BNSFRR right-of-way would be relocated in accordance with the guidelines and procedures described in the Section 4.11, Relocation. No further mitigation is warranted. Under the Point Edwards Alternative, no measures are proposed to mitigate for view obstructions at the south end of the marina.

Religious/Cultural Institutions

Because none of the proposed alternatives would have a direct impact on any churches or cultural institutions in the project area, no mitigation is required.

Pedestrians and Bicyclists

In order to reduce any impediment to the circulation linkage between the north and south ends of the waterfront created by the various structures and roadways proposed under the Mid-Waterfront Alternative, an at-grade or elevated crossing of the ferry holding/egress lanes would be provided. A crosswalk for pedestrians/bicyclists would be marked across the ferry staging lanes to allow for free crossing movement of bicyclists and pedestrians during non-loading and unloading periods. A pedestrian-activated traffic signal would provide for safe pedestrian crossing during ferry loading and unloading traffic periods. The location of this crosswalk traffic signal approximately 700 feet from the ferry slip should not affect loading capacity. An override timing scheme could be provided to allow WSF loading staff to block out crossing pedestrian phases during the last critical minute before boat sailing. The Dayton Street underpass would be designed to accommodate both pedestrian and bicycle usage, either in a combined or separate facility.

4.13 Economics

4.13.1 Studies and Coordination

The following discussion is based on the economics discipline report (CH2M HILL and Berk and Associates, 1995), which is incorporated into this EIS by reference and recent analytical analysis based on updated data.

Long-Term Operation Impacts

Two major elements were considered in the assessment of potential long-term economic impacts. The first is associated with right-of-way property acquisitions and the displacement of existing businesses. The other is related to expected changes in traffic patterns and access to local businesses.

Right-of-Way Acquisition Impacts

To meet the right-of-way requirements for the proposed build alternatives, acquisition of some privately owned land would be required. This purchased land would be put to a public use, and its value would be removed from the tax rolls. Furthermore, the businesses located on these properties, and their employees, would be displaced and would need to be relocated.

Acquisition of properties may have long-term economic impacts as a result of the loss of property value to the City's property tax base, loss of sales tax revenue, and loss of local employment opportunities. The analysis of long-term economic impacts from right-of-way acquisition was based primarily on the analysis and conclusions presented in Section 4.11, Relocation, and in the relocation discipline report.

Access to Local Business Community

In general, major transportation facilities tend to act as a catalyst for economic activity as businesses take advantage of the traffic flows. Facilities that provide a connection point for several modes such as airports, train stations, and ferry terminals draw from a larger area and concentrate traffic within a relatively small area, providing an economic opportunity for businesses that cater to the needs of this population. Business opportunities will vary according to the specific characteristics and functions of the facility; however, potential benefits to businesses will be derived from the general exposure offered, the accessibility to the business, the volume of traffic and the specific flow of traffic. Impacts to local business from changes to the existing conditions were evaluated by analyzing the effect on these variables, as follows:

- **General exposure.** The mere presence of the Edmonds ferry terminal provides an opportunity for travelers to learn about opportunities to visit, shop, or work in Edmonds. For some of these people, traveling through Edmonds may be their first exposure to the downtown/waterfront district; without the ferry, they may never have had that opportunity. This exposure may result in new trips to Edmonds that are not ancillary to a trip to the ferry terminal, but where the downtown/waterfront district is the trip destination.

- **Accessibility.** The ease and convenience of access to and from the commercial business district is an important determinant of the economic benefits of the ferry terminal. Both retail and other commercial uses, such as general office services, will directly benefit from the access to this regional transportation facility. The action alternatives were evaluated in terms of their relative accessibility, compared to the current conditions.

- **Traffic volumes.** Each project alternative is projected to accommodate the same level of future traffic. Table 4-16 presents current and expected future facility volumes according to the trip purpose. As the table indicates, most of the passenger growth is related to ferry traffic. This volume growth means more people will be passing through Edmonds, providing increased opportunities for local businesses. However, because the increase in volume is projected to be the same for all alternatives, there should be no substantial economic impacts exclusively as a result of traffic volumes.

Table 4-16
Estimated Traffic Volumes

Transportation Mode	1995 Daily Passengers	2005 Daily Passengers	Increase (percent)
Ferry	11,061	16,592	50
Long-distance (Amtrak)	23	136	491
Intercity rail	-	200	-
Commuter rail	-	1,960	-
Well wishers and greeters	12	1,148	95
Total	**11,096**	**20,036**	**81**

Note: Estimates for ferry traffic passengers represent a total passenger head count including both automobile and walk-on traffic.

- **Traffic flow.** While the volume of traffic is not expected to differ among the alternatives, traffic flow may be substantially altered, depending on the selected site. There were two components of ferry-related traffic that required analysis: people who might drive to and from the local business district as part of their trip through Edmonds, and those who might walk to a business from the ferry terminal. Clearly, the walk-up component of the traffic will be highly sensitive to changes in location, while the drive-up component of ferry-related traffic may vary with changes in the overall transportation network. Local (non-ferry-related) traffic may be altered as a result of a general improvement in the transportation network allowing for more convenient trips into the downtown/ waterfront district. Retail-type businesses will most likely be affected by substantial changes in traffic flow.

Coordination with Agencies or Other Groups

Contacts for collecting data and identifying issues included City of Edmonds staff and the Washington State Department of Revenue's Research Division. In addition, contact was made with individuals involved in the City's current economic development effort for the downtown/waterfront activity center (see Appendix A).

4.13.2 Impacts

Long-term impacts from the project are summarized in Table 4-17.

Alternative 1: No Action

The No Action Alternative would not require the acquisition of any adjacent property; as a result, economic impacts associated with business displacement are not an issue with this alternative.

Traffic patterns leading to and from the ferry terminal and the existing train depot would remain the same under this alternative. Therefore, any positive or negative economic impacts associated with existing vehicular ferry and train traffic would continue as currently experienced and generally would increase as this traffic grows over time.

Table 4-17
Long-Term Economic Impacts

Alternative	Relocation Impacts		Change In Shopping Patterns	
	Number of Businesses	Number of Jobs	Driving Patterns	Walking Patterns
Alternative 1	0	0	No change anticipated.	No change anticipated.
Modified Alternative 2	0	0	A small reduction in local trips is projected. Local traffic access to waterfront beaches will be improved. Access to the commercial district will be maintained; therefore, potential impacts are not likely to be substantial.	Because of location, pedestrian access to downtown and waterfront businesses would be limited.
Alternative 3[a]	24	47 full-time 60 part-time	Local share of traffic circulation would remain relatively the same; therefore, no substantial change is expected.	Pedestrian access to waterfront businesses would improve slightly and access to downtown businesses would be largely unchanged.

[a]*The number of employees displaced by Alternative 3 is based on the best available data from interviews with the affected businesses in July of 2001. For businesses which were unavailable for interviews, employee displacements were based on field reconnaissance on July 16, 2001 and best professional judgement. As part of the additional outreach in 2003 associated with the Environmental Justice Analysis, it was found that the number and mix of businesses recorded in July 2001 had changed somewhat, as is reflected in the Environmental Justice Analysis (see Appendix G).*

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

Right-of-Way Acquisition Impacts

Under this alternative, private property currently owned by UNOCAL would be purchased and removed from the property tax rolls. However, this property is not densely developed and its value as a percentage of the City's tax base is expected to be small. In addition, moving the terminal to the Point Edwards site would improve access and reduce congestion around the existing terminal, also freeing up properties currently used for ferry operations. These conditions would provide an opportunity for additional development around the existing terminal, consistent with the goals of the *Edmonds Downtown/Waterfront Plan*. Furthermore, the balance of the existing UNOCAL property would be available for development and would benefit from the access improvements. The value of these new development opportunities would add to the City's tax base, which could offset any potential negative tax impacts associated with the ROW acquisitions.

Local Business Impacts

As discussed above, the influence of ferry traffic and patrons on the local economy appears to be marginal on a citywide basis, but may have a substantial impact on certain downtown/waterfront retail businesses. Given the relative proximity of the Point Edwards site to the existing facility, it is unlikely that the business community will experience any loss as a result of reduced exposure. In fact, a new and improved facility may increase the general exposure and visibility of the community.

According to anecdotal survey information, businesses in the downtown/waterfront district attribute a portion of their business activity to the ferry. The Edmonds Chamber of Commerce survey reported that approximately 50 percent of the downtown retail businesses noticed a decrease in traffic and sales during the February 1995 closure of the auto ferry terminal. At Point Edwards, the ferry operations would continue, but would be relocated south of downtown. Therefore, the relevant issue for this analysis is whether moving the facility approximately 2/3 mile will change any of these economic conditions. The most likely cause of economic impacts would be from changes in accessibility and general traffic circulation.

Auto Traffic

According to the transportation analysis, traffic circulation patterns to and from the ferry terminal and existing train depot will be substantially affected by a relocation of these activities to the Point Edwards site. Table 4-18 compares projected traffic patterns for the two build alternatives. The table shows the origin and destination of ferry and multimodal center traffic. Trips that are passing through the City on the way to or from the terminal are presented in terms of where they enter or leave the general area. The balance of the trips (those that are starting or ending in the City)

are shown as local trips. These local trips are the most relevant in terms of the direct potential economic impact.

Table 4-18
Circulation Patterns: Alternative 1 versus Modified Alternative 2
(P.M. peak hour traffic 2030)

	Alternative 1		Modified Alternative 2	
	Access	**Egress**	**Access**	**Egress**
From: Ferry Traffic[a]				
To:				
Main/3rd/212th/196th	25 percent	30 percent	25 percent	30 percent
SR 104	75 percent	70 percent	75 percent	70 percent
From: Multimodal Center[b]				
To:				
Main/212th/Puget/196th	34 percent	55 percent	60 percent	60 percent
SR 104	33 percent	25 percent	40 percent	40 percent
Local trips	33 percent	20 percent		

[a]*Ferry traffic is traffic embarking on or disembarking from the ferry.*
[b]*Multimodal center traffic is travelling to or from the parking lot or the passenger drop-off areas.*

Under the No Action Alternative, 100 percent of the ferry trips and 67 percent of the multimodal center trips are traveling through the City on their way to these facilities.

The percentage of through-trips is even higher for trips starting at these facilities, with 100 percent of the ferry trips and 80 percent of the multimodal center trips simply traveling through town. Thus, the baseline conditions would indicate that very few of the peak-hour trips are being diverted to the downtown/waterfront district.

The Point Edwards Alternative would result in substantial changes in how the traffic flows through the City, but the share of local trips would be only marginally less than the No Action Alternative. One reason the share of local trips would be relatively constant is that it would still be possible to access the downtown/ waterfront district without a major increase in travel time. People who want to go downtown would still have the same opportunities to do so. As a result, the relocation to Point Edwards does not appear to provide a disincentive to making a vehicular trip downtown.

The biggest traffic pattern change would be the elimination of the traffic volumes passing through town on Main Street, causing periodic bursts of congestion in the heart of downtown. Most of these trips would take SR 104 to I-5 or SR 99. This route would alleviate some of the transportation problems downtown, improving access for non-ferry-related trips, and potentially attracting new local trips. The drawback to this transition would be the loss of visibility because travelers would not be compelled to drive through the town center.

Pedestrian Access

The walking distance between the Point Edwards site and downtown is approximately 2/3 mile, which might be farther than most people are willing to walk (Figure 4-15). Frequent bus service from the multimodal center would be needed to provide pedestrian access to the downtown area. In fact, the distance from the terminal could virtually eliminate the existing walk-up business for many downtown retail and restaurant establishments. The magnitude of this impact, however, is not easily quantifiable and would vary by business according to the relative importance of this component of the market.

Since the drive-up component is likely to be relatively unchanged, and most of the economic benefit appears to be derived from this component of ferry traffic (because most Edmonds-Kingston ferry riders have a vehicle), it can be inferred that the loss of walk-up business would probably not be substantial when measured on a district-wide basis and certainly on a citywide basis.

Competition from On-Site Uses

The addition of new commercial space could increase business competition and possibly result in decreased business activity for some local businesses. Under this alternative, 1,000 square feet of commercial space is included in the multimodal center's design that is intended for concession operations. Because of the size of this space, it would not be expected to negatively impact other business activity in the community.

Phase 1

Property Acquisition Impacts

Most of the property required for the project's proposed facilities would be acquired during Phase 1. The accelerated acquisition of this property would result in its value being removed from the City's tax base sooner. However, the new development opportunities around the existing ferry terminal would also be available sooner.

The potential value of these new development opportunities could add to the City's tax base, which could offset the potential negative tax impacts associated with the project-related property acquisitions.

Local Business Impacts

The development of Phase 1 would result in certain local business impacts occurring sooner. These impacts are estimated to be proportional to the impacts discussed for full buildout. When the multimodal center would open in 2008, traffic patterns for ferry users would change at that time and any impacts associated with these traffic pattern changes would begin. For example, downtown businesses may start to experience a benefit from reduced traffic congestion because ferry traffic would no longer travel through downtown. Conversely, the downtown may begin to experience impacts associated with reduced visibility to travelers.

Alternative 3: Mid-Waterfront Site

Full Buildout

Right-of-Way Acquisition Impacts

The Mid-Waterfront Alternative would have the largest right-of-way impacts with regard to the number of dislocations of existing businesses and employees. Section 4.11, Relocation, estimates that 24-plus businesses (17-plus service/office[1], three restaurants, and 4 retail establishments) and their 47 full-time and 60 part-time employees would be displaced[2]. The majority of these businesses and employees are located in the 48,600-square-foot Sunset Avenue Complex (the old Safeway Store) and the 18,000-square-foot Edmonds Bay Building. Additional displacements also include four independent boat repair services, plus storage facilities located on Port of Edmonds property. The Port of Edmonds Strategic and Master Plans mention recent and future investments aimed at serving these maritime businesses. These investments include a boat-cleaning area and 50-ton travel lift that will be used to transport boats from the water to the workyard.

Potential loss of city sales tax and loss of employment associated with these business acquisitions could be offset by relocating the businesses within the City. Because the most important factors in site selection for smaller businesses are based on personal preferences of the key decision makers, such as the relative proximity to the business owner's home, one would expect that there would be a high propensity for displaced businesses to relocate in the City. This assumes that there is an adequate supply of available space that is suitable and affordable to these businesses. If the supply of comparable space is limited or too expensive, then businesses that would otherwise like to stay in Edmonds would likely have to relocate outside the City.

The parking garage design for this alternative includes approximately 49,000 square feet of street-level commercial space intended for retail use. It might be possible for some of this space to be used to house the displaced retail businesses, if this space would meet the individual needs of those businesses. If the space was suitable, it would lessen the economic impact of right-of-way acquisitions because businesses would be relocated within the City, close to their current locations. Regardless of the suitability for displaced businesses, if this new retail capacity is absorbed it will largely mitigate the loss in sales tax revenues resulting from the displacements.

[1] Service industries include the boat storage facilities located on Port of Edmonds property and the boat repair businesses located between Admiral Way and the BNSFRR right-of-way.

[2] The number of employees displaced by Alternative 3 is based on the best available data from interviews with the affected businesses in July 2001. For businesses that were unavailable for interviews, employee displacements were based on field reconnaissance on July 16, 2001, and best professional judgment. As part of the additional outreach in 2003 associated with the Environmental Justice Analysis, it was found that the number and mix of businesses recorded in July 2001 had changed somewhat, as is reflected in the Environmental Justice Analysis (see Appendix G).

SMA 10
SMA 9
Salmon Management Area Boundary (SMA)
Breakwater
Overhead Loading
Overhead Pedestrian Walkway
New Ferry Pier
UNOCAL Pier (to be removed)
Port of Edmonds Marina
P U G E T S O U N D
Existing Overhead Pedestrian Walkway (would be relocated)
Existing Ferry Terminal (shaded portion to be removed)
Turnaround
Bus Stops
Terminal Building
Daylighted Section of Willow Creek (Lined Channel)
Admiral Way
Drop Off
Railroad Platform
Covered Pedestrian Walkway
Bus Loading Area
Railroad Ave.
Willow Creek Outlet
Emergency Tide Gate
Open Channel
Stairs and Elevator
Ferry Holding Area
Short-Term Parking
Stormwater Treatment Pond
1/4-Mile
Salt Marsh
Garage Entrance (below)
2-Level Parking Garage
EDMONDS CITY LIMITS
WOODWAY TOWN LIMITS
Employee Parking Stalls
Toll Booths/2nd Story Employee Facilities Safe Room/ Agent Accounting Room
Edmonds Marsh
Willow Creek
Terminal Access Road
Existing SR 104 (Edmonds Way)
Freshwater Wetlands
Deer Creek Hatchery
Sunset Ave. N.
2nd Ave. N.
James Street
Main Street
Bell Street
2nd Ave. S.
3rd Ave. N.
3rd Ave. S.
Alder Street
Dayton Street
SCALE IN FEET
(1" = 400')
0
200
400

154090.G1.07.A1_T092004007SEA • 4-15 Pt. Edwards Quarter Mile • 9/24/04 • dk.gm

EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 4-15

Modified Alternative 2 (Preferred Alternative): Point Edwards Site: Area Encompassed in 1/4-Mile Standard Walking Distance

This alternative would also require land at the south end of Railroad Avenue where it currently intersects with Dayton Street. The result of this acquisition would be a cul-de-sac at the south end of Railroad Avenue, with Main Street serving as the only direct access to the property. This change in traffic circulation may have an impact on businesses along Railroad Avenue.

While it is likely that the potential for economic impacts from displacements will be largely offset by businesses relocating to other locations within the City of Edmonds and the commercial space in the proposed parking garage, for purposes of evaluation it is useful to consider the potential for a worst-case scenario. Such a scenario would occur should the displaced businesses be unable to relocate within the City and the commercial space in the proposed parking garage not be leased to new businesses. In this case, it is estimated that a total of 107 (47 full-time and 60 part-time) jobs would be lost, representing a 1.1 percent decrease in employment compared to the City's 2000 employment level of 10,038.

Local Business Impacts

As with Point Edwards, the key factors affecting local businesses would be changes in accessibility and traffic circulation patterns. The Mid-Waterfront site would be located near the existing terminal, so the circulation impacts, in particular the effects on pedestrian access, would likely be less important than those experienced at the Point Edwards site.

Auto Traffic

According to the transportation analysis, traffic to and from the proposed multimodal center at the Mid-Waterfront site would be similar to the Point Edwards site, since both alternatives tend to steer traffic toward SR 104. Table 4-19 presents the traffic circulation patterns for peak-hour traffic for the Mid-Waterfront Alternative compared to the No Action Alternative.

The share of traffic simply flowing through town, either moving to or from the multimodal center, is expected to remain essentially unchanged. As a result, the number of trips beginning or ending in the downtown/waterfront district will remain virtually unchanged, implying even smaller relative impacts to local business than those of the Point Edwards site.

The improvement to Main Street would not be as substantial as projected for Point Edwards, where all ferry traffic would be rerouted. Any potential business activity benefits associated with the improvement of downtown traffic at peak ferry times would be comparably affected. The good news for some local merchants is that some of the exiting traffic will continue to move through town, though not down Main Street as under the No Action Alternative.

Table 4-19
Circulation Patterns: Alternative 1 versus Alternative 3
(P.M. peak hour traffic, 2030)

	Alternative 1		Alternative 3	
	Access	**Egress**	**Access**	**Egress**
From: Ferry Traffic				
To:				
Main/212th/3rd/Puget/196th	25 percent	30 percent	25 percent	30 percent
SR 104	75 percent	70 percent	75 percent	70 percent
From: Multimodal Center				
To:				
Main/212th/Puget/196th	34 percent	55 percent	34 percent	55 percent
SR 104	33 percent	25 percent	33 percent	25 percent
Local trips	33 percent	20 percent	33 percent	20 percent

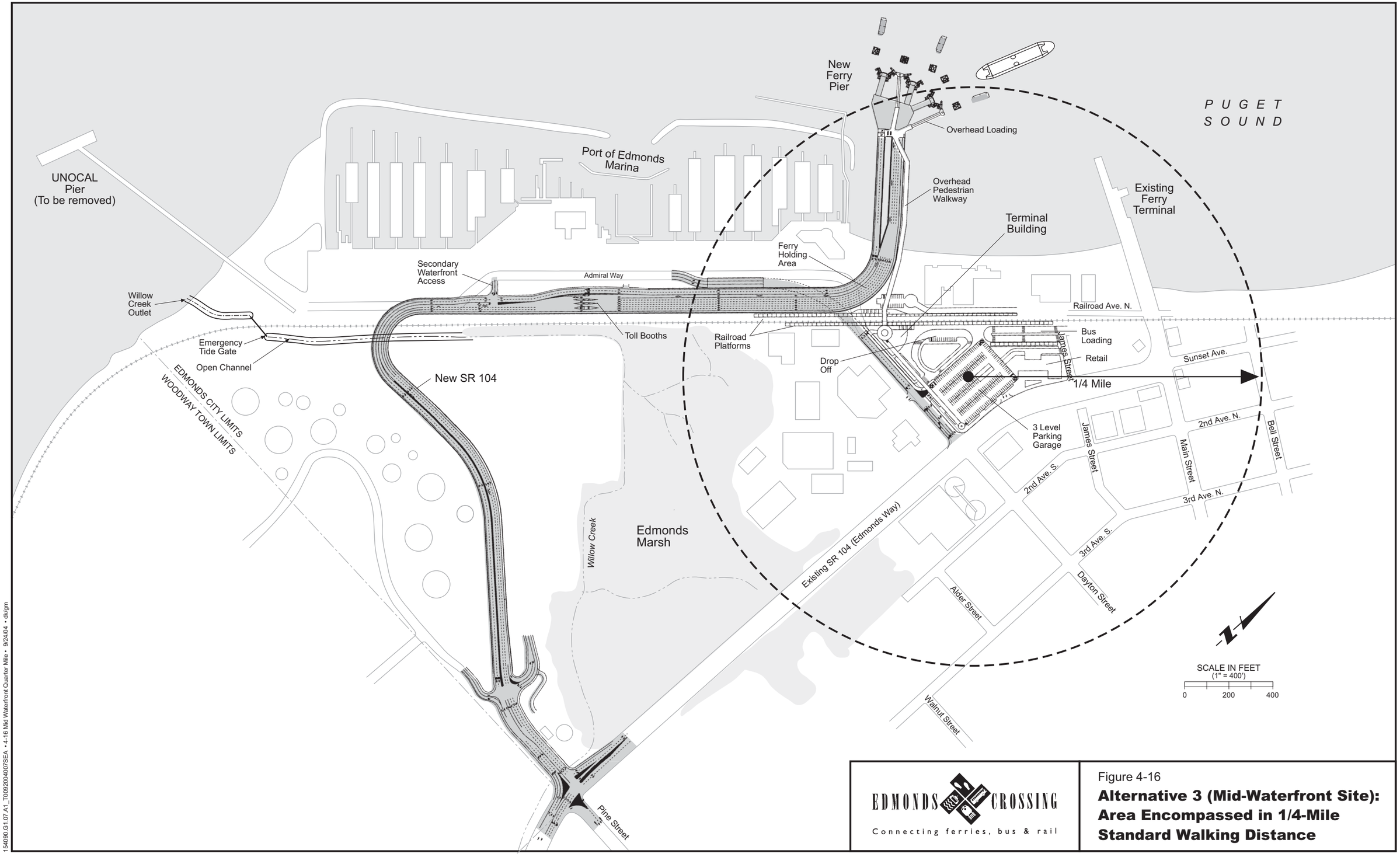
Under the Mid-Waterfront Alternative, automobile access to the Port of Edmonds would be possible through the Dayton Street underpass to Admiral Way, as well as by means of the secondary route from the realigned SR 104. Although some vehicles could be precluded from using the underpass because of height restrictions (not yet determined but estimated to range between 14 and 16 feet), they would be able to access the Port from the secondary route provided immediately south of the toll booths.

Pedestrian Access

Mid-Waterfront would not have the same potential negative impact on opportunities for pedestrian access from the terminal, because the facility would still be located within a reasonable walking distance to the downtown and waterfront retail businesses (Figure 4-16).

Competition From On-Site Uses

The addition of new commercial space can increase business competition and, possibly, result in decreased business activity for some businesses. Under this alternative, 1,000 square feet of commercial space is included in the terminal's design and is intended for concession operations. Because of the small size of this space, it is not expected to negatively impact other business activity in the community. However, the 49,000 square feet of retail space proposed as part of the terminal's parking structure could pose a threat to some local merchants if this space were filled with businesses that would compete directly with the retail activity in the downtown/waterfront area. Possible mitigating circumstance for this scenario would be if some of this space were taken by the displaced businesses or potential for growth in the total market as a result of moving the existing terminal and



EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 4-16

Alternative 3 (Mid-Waterfront Site): Area Encompassed in 1/4-Mile Standard Walking Distance

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allowing new development activity on the waterfront. The type and level of growth would depend on land use decisions made by the City and market conditions.

If the new retail space were filled with a combination of complementary uses and new users with a wider marketing draw, the total traffic into the area might increase, benefiting new and existing businesses alike. Until it is known which types of businesses would locate in this new facility, it is not possible to assess whether the impact to existing businesses might be negative, positive, or neutral.

Phase 1

Property Acquisition Impacts

Most of the properties required for the proposed facilities would be acquired during Phase 1. Included in the Phase 1 property acquisitions would be the Sunset Avenue Complex (the old Safeway Store) and the Edmonds Bay Building. The majority of the businesses and employees that would be displaced would be located in these facilities.

The development of Phase 1 would not include the construction of the parking garage that would contain approximately 49,000 square feet of street-level commercial space. Therefore, this space would not be available as a potential site to relocate some of the displaced retail businesses once Phase 1 is completed, which may make it more difficult to relocate businesses within the City, close to their current locations. The development of this additional retail space later in the project timeline would delay the ability for business activity in the new retail space to offset the loss in sales tax revenues from displacements for property acquisition.

Local Business Impacts

Similar to the Point Edwards phasing scenarios, the phased development of Mid-Waterfront would accelerate the estimated changes in traffic patterns described under full buildout because portions of the multimodal center would be operational in 2008 instead of 2015, but should not change the impacts described for full buildout.

The most substantial impact associated with Mid-Waterfront phasing would be the change in accessibility to the Port of Edmonds. The Dayton Street underpass to Admiral Way would not be constructed as part of Phase 1. Therefore, the only access to the Port and other waterfront businesses would be the secondary route from the realigned SR 104 (ferry access lane). Traffic traveling to the Port would use the HOV/bypass lane on the realigned SR 104 and turn left, immediately south of the toll booths, onto Admiral Way. This somewhat circuitous route may reduce the willingness of the public to travel to these businesses and could reduce their visibility. The access route to the Port of Edmonds would be clearly marked with appropriate signage to minimize these impacts until the Dayton Street underpass to Admiral Way is constructed as part of full buildout.

4.13.3 Mitigation Measures

For Point Edwards, signs and information about bus service from the multimodal center to the downtown/waterfront area would be posted to encourage passengers to travel downtown. For Mid-Waterfront, adequate signs and a business directory would be used to direct passengers to the waterfront and downtown area and make them aware of surrounding business activities. If possible, displaced businesses could be relocated to retail space on the ground floor of the proposed parking garage.

Under Washington State's RARPAP and the federal URA, businesses displaced by the project would be eligible for relocation advisory services and compensation payments as provided under these regulations.

4.14 Cultural Resources

4.14.1 Studies and Coordination

The following discussion is based on the cultural resources discipline report (CH2M HILL, 1995), which is incorporated into this EIS by reference.

The historic resources project area was defined to include all potentially affected sites, buildings, structures, and property adjacent to the two build alternatives. The archaeological resources project area included the proposed access roadway alignments and multimodal terminal footprints associated with the same two alternatives.

A file search was conducted at OAHP in Olympia for records of previously recorded sites and previously conducted investigations. The OAHP State Archaeologist was consulted during the file search. Several Native Indian tribes were contacted by letter to solicit their comments and concerns with regard to possible traditional cultural properties in the project area: Jamestown S'Klallam, Lower Elwha Klallam, Port Gamble S'Klallam, Skokomish, Muckleshoot, Swinomish, Yakama, Tulalip, Suquamish, and the Lummi. Only the Suquamish have responded with comments, suggesting that traditional cultural properties may be present in the project area.

An archaeological reconnaissance survey was conducted in May 1995, and the results were subsequently documented in the cultural resources discipline report (CH2M HILL, 1995), which was reviewed by the State Archaeologist. The archaeological reconnaissance used a pedestrian survey with parallel transects up to 65 feet apart to examine all undeveloped areas within the proposed footprints of the multimodal terminal The archaeological survey was designed to identify surface cultural materials and to consider the potential for critical subsurface cultural materials along the alternative roadway alignments and footprints.

Field conditions required frequent adjustments to the survey strategy to compensate for the wide variety of landscapes found throughout the project vicinity. Obstructions included the presence of industrial (UNOCAL) and commercial

developments, paved parking lots, steep sloping hillsides, and areas of dense or impenetrable vegetation. In some areas, vegetation totally obscures the ground surface rendering multiple pedestrian transects fruitless. In consultation with the OAHP and WSDOT, a program of subsurface exploratory archaeological testing was designed to check for the presence/absence of archaeological sites that might be present below modern developments.

The presence/absence testing plan was approved by OAHP and WSDOT and was implemented in late 1996. Under the direction of CH2M HILL archaeologists, 21 backhoe trenches were excavated. No cultural deposits were discovered in any of these excavations. Although archaeological sites could still be present in the project areas, the findings of the subsurface testing program suggest that the probability is moderate to low. For a detailed discussion of the methodology and findings see *Presence/Absence Testing for Archaeological Resources* (Bard and McClintock, 1996).

An historic properties field survey of the historic resources project area was conducted in May 1995. All areas potentially affected by the build alternatives were surveyed, and potential historic resources were located, photographed, and described in notes as appropriate. The field survey was supplemented by contacts with the City of Edmonds Community Services Department, UNOCAL Northern Region Corporate Environmental Remediation & Technology, the Edmonds Historical Museum, the University of Washington Special Collections, WSDOT bridge historians, and the Tacoma Public Library. The existing UNOCAL site was identified as being potentially important. Subsequent research and field reconnaissance was conducted in mid-1996 (Cox and Bard, 1996). The *Determination of (National Register of Historic Places) Eligibility Report* that was prepared and resulted in a finding that UNOCAL is not eligible for listing in the National Register (Cox and Bard, 1996). The State Historic Preservation Officer concurred with this finding in August 1996 (see Appendix A). Consultation with Alex Young (WSDOT Bridge Historian) determined that the pony truss bridge incorporated into the Unocal Pier is historically insignificant.

Standard reference works and local historical volumes were reviewed and several existing historic inventories were examined, including the National Register of Historic Places, the State Register of Historic Places, and the Snohomish County Cultural Resources Inventory (Sherwin, *et al*., 1978).

4.14.2 Impacts

Alternative 1: No Action

There are no impacts anticipated from the No Build alternative.

Impacts Common to Both Build Alternatives

Full Buildout

Once constructed, neither the Point Edwards nor the Mid-Waterfront facilities should produce any long-term operation impacts to archaeological sites or historic properties.

4.14.3 Mitigation Measures

Because no long-term impacts to archaeological sites or historic properties are anticipated, no mitigation is proposed. Possible impacts associated with construction of either build alternative are discussed in "Construction Activity Impacts" later in Chapter 4.

4.15 Tribal Fishing

4.15.1 Studies and Coordination

Refer to the "Studies and Coordination" section under Section 4.9, Vegetation, Fish, and Wildlife, in this chapter. The analysis of tribal fishing is based on the scientific and technical analyses noted in this previous section, as well as on the extensive government-to-government consultation and coordination process that has been conducted since the publication of the Draft EIS with the Suquamish, Tulalip, Lummi, and Swinomish tribes. Under the DOT and FHWA Orders relating to Environmental Justice, members of these tribes are minority individuals and, as such, are also considered in the Environmental Justice Analysis (see Appendix G). The design of Modified Alternative 2 and the mitigation measures proposed reflect specific input from the tribes received during the consultation/outreach process.

4.15.2 Impacts

Alternative 1: No Action

Impacts to tribal and commercial fishing operations are slight at present but still exist. The existing ferry route crosses through the SMA 9/10 boundary and productive shrimp habitat. Tribal shrimp fishers set pot strings close to and around the existing ferry lane but do need to avoid the ferry lane itself. The primary issue is the potential entanglement of shrimp pot gear in ferry boat propellers during adverse weather conditions, such as fog and high winds. Fortunately, the fishery is conducted in April when fog and high winds are not common. In addition to the shrimp fishery, the tribes also conduct fisheries for non-salmonid finfish in SMA 9. Present ferry operations preclude such fishing activity in the area offshore of the existing terminal. While commercial salmon fisheries do not presently exist in SMA 9 (Point Edwards to Port Townsend), the tribes may conduct fisheries some time in the future. When the timing and geographic distribution of various salmon stocks within SMA 9 are understood, it may be possible to open the area and still effectively manage for the conservation of weak stocks. If this occurs, the present

terminal and ferry operations would have an impact on tribal fishing activity by excluding fishing directly offshore of the terminal in the ferry lane.

The No Action Alternative would have the least impact of the three alternatives on tribal and commercial fishing operations.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

The Point Edwards Alternative presented in the DEIS was aligned to superimpose over the UNOCAL pier. In this configuration, the terminal was positioned within SMA 10, just south of the SMA 9 boundary. During consultation with the concerned tribes (Suquamish, Tulalip, Swinomish, and Lummi), this alignment was identified as undesirable in terms of potential interruption of tribal salmon fishing activity in SMA 10 as a result of ferry operations. In response to tribal concerns, the pier was realigned so that the terminal deck was mostly in SMA 9. With this alignment, the ferry vessels would operate in SMA 9. The importance of this is that commercial salmon fishing is presently closed in SMA 9 and seasonally opens in SMA 10. Ferry operation in SMA 9 would not affect tribal or nontribal commercial salmon fishing. The slips would be angled so that the ferry vessels would approach and leave the terminal from the northwest, thus enabling the ferries to stay out of the Point Edwards salmon fishing area (Figure 4-17). With ferry traffic staying to the north of the SMA 9/10 line, the potential of ferry boat conflicts with tribal gillnet fishers would be greatly minimized and would be expected to be minimal.

The discussion in the preceding paragraph is predicated on present fishery management conditions. As stated in the No Action Alternative discussion, the tribes have indicated that they believe that SMA 9 may be opened some time in the future to commercial fisheries. If this is the case, Modified Alternative 2 would be less successful in avoiding tribal fishing activities than is currently the case. Tribal fishers may wish to drift their nets in close proximity to or through the ferry lane. As stated in Section 3.3.6, Point Edwards is a particularly productive fishing site, and the site spans both sides of Point Edwards. If SMA 9 is opened, the preferred alternative would necessarily exclude tribal fishing activity in the ferry lane for about one-half of each night during a given fishery opener. Gillnet fishing is conducted from dusk to dawn (7 p.m. to 6:30 a.m. in mid-September). During this time frame ferries do not operate from 12 midnight to 5 a.m. Thus, the overlap of ferry operation and fishing activity would be about 5.5 hours each night of a fishing opening.

As stated in Section 3.3.6, Dungeness crab are not currently fished in the immediate vicinity of Point Edwards by tribal fishers. However, increased tribal fishing in this catch management area, or shifts in abundance in currently targeted areas, could result in the tribe's desire to fish for Dungeness crab in the area of the proposed terminal. This would be offset by the opportunity to fish offshore of the existing terminal.

Geoduck offshore of the proposed terminal are likely to be present in at least moderate and commercially harvestable densities. This area is presently quarantined by the Washington Department of Health due to water pollution (fecal coliform). Tribal representatives have stated that improvements in water quality

may lead to an upgrade to the area classification, thereby opening the area to commercial harvest. Ferry operations would preclude harvest within the ferry lane immediately offshore of the terminal. This would be offset to some degree by the opening of the area in front of the existing terminal. However, a portion of this area is presently degraded (as geoduck habitat) by propeller wash scour (to a depth of about -40 to -50 feet MLLW). Plans to restore the scoured area with habitat conducive to geoduck production is part of the mitigation package, although it will take at least 10 years for geoducks to reach commercially harvestable size after habitat restoration is completed.

The tribal shrimp fishery off of Point Edwards is conducted at a depth of 200 to 300 feet in a band from Point Edwards to a ship wreck about 1.0 mile north of Picnic Point. The fishing area is crossed by the existing ferry lane and would also be crossed by the proposed Point Edwards ferry lane. Shrimp fishing activity in the immediate vicinity of Point Edwards likely would move northward and probably to the area near the existing ferry lane. There is good reason to assume that the quality of these two areas is the same (they are only about 500 yards apart, the bathymetry is the same, and the bottom character is the same). The Suquamish shellfish biologist and the WDFW shrimp fishery manager have concurred that the two areas are highly likely to be the same. The only difference between the two sites is that the depth band fished is closer to shore at Point Edwards than along the existing ferry lane. This means that there would be less ability at Point Edwards for ferry captains to avoid shrimp pot buoys if accidentally placed along the new ferry lane. If a ferry boat ran straight over a buoy, there is a chance that the shrimp pot gear could become tangled on the fore or aft propeller.

In the future, if SMA 9 is opened to tribal fishing, WSF and the tribes will confer with one another to identify opportunities to avoid or reduce potential conflicts between tribal fishing activities and vessel operations.

Alternative 3: Mid-Waterfront Site

Impacts on tribal fishing would be similar to the No Action Alternative. Ferry vessels would operate in SMA 9, and the ferry lane would remain in SMA 9 until reaching the shipping lanes. However, as discussed in the previous sections, if SMA 9 were opened to salmon fisheries, fishing/ferry conflicts could occur. The likelihood and severity of the conflicts would be less with this alternative than with the Preferred Alternative because this location is farther north of Point Edwards. As is the case today, the ferry vessels would cross through productive shrimp habitat. Most shrimp fishers would presumably move north or south of the proposed ferry lane to avoid potential collision.

4.15.3 Mitigation

Because salmon and salmon fishing in Puget Sound have great cultural, economic, religious, and historical importance to the affected tribes, and because several tribes have treaty fishing rights in the project area, any potential changes required by future ferry operations must be avoided or minimized to the maximum extent possible. Potential disruption of currently favored patterns of salmon fishing off

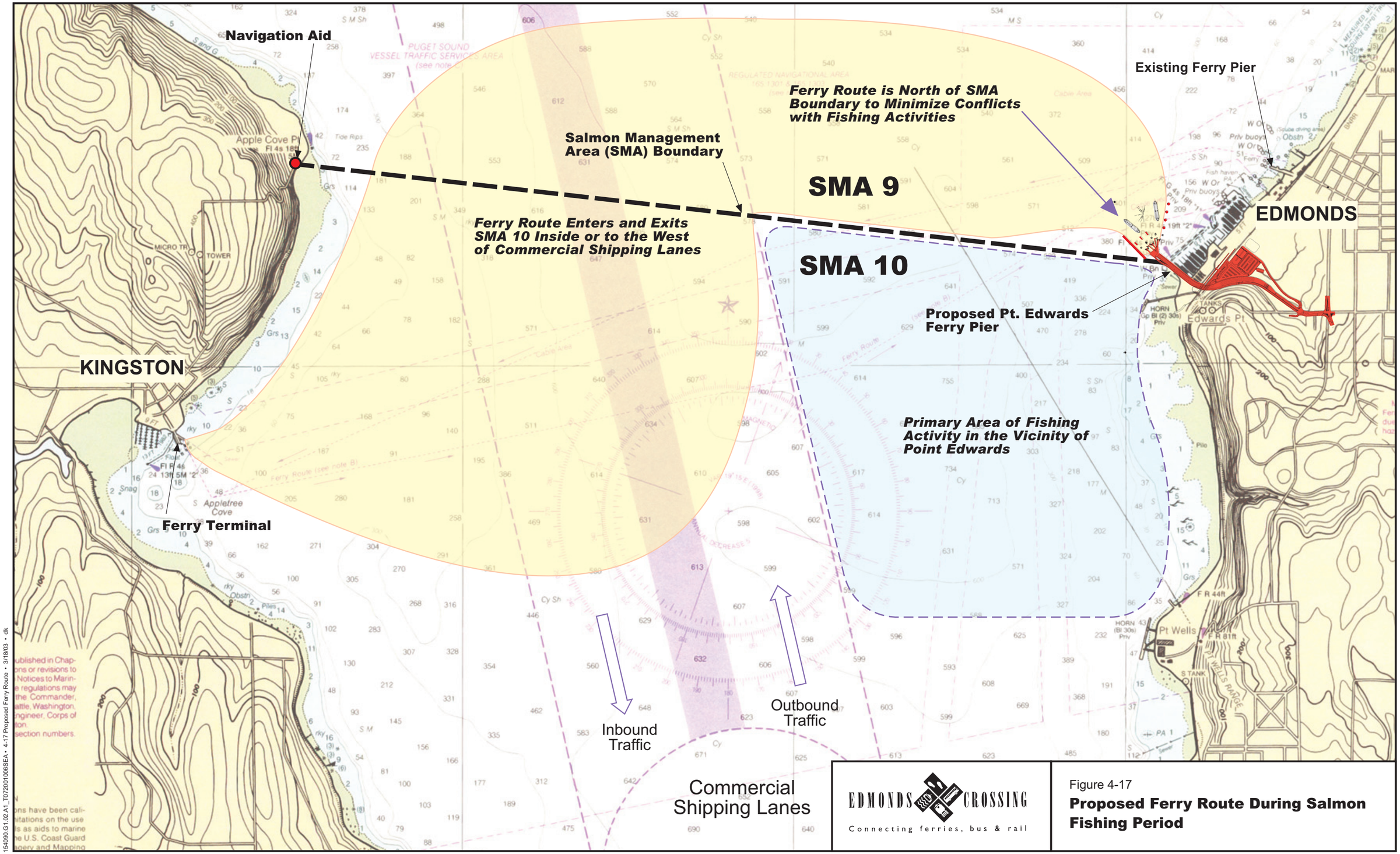

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Figure 4-17
Proposed Ferry Route During Salmon Fishing Period

154090.G1.02.A1_T072001006SEA • 4-17 Proposed Ferry Route • 3/18/03 • dk

Point Edwards is an issue because of the Tribes' treaty right to take fish in their usual and accustomed fishing grounds.

Changes to tribal fishing patterns as a result of the Preferred Alternative will be avoided or minimized as much as possible. Maintenance and access to viable fishing grounds will help perpetuate Indian culture by sustaining the traditionally and currently important customs associated with fishing.

Extensive government-to-government consultations have occurred between FHWA, WSDOT, the City of Edmonds, and representatives of the Suquamish, Lummi, Tulalip, and Swinomish Tribes since the publication of the Draft EIS. The topic of these consultations was appropriate measures to mitigate for identified impacts on the continued exercise of treaty fishing rights and activities of the tribes. The result of these consultations is an agreement on measures that the parties intend to memorialize in a Memorandum of Agreement (MOA) among all of the parties. The negotiations are ongoing, however, the MOA is expected to include the following:

- Prior to beginning construction of the project, WSF and the tribal parties will develop an operating protocol intended to coordinate ferry operations with tribal fishing activities.

- Within 1 year of the effective date of the MOA, WSF and the tribal parties will enter into a Protocol of Inadvertent Discovery of Historic Resources, in coordination with the State Historic Preservation Office, that will govern state and tribal roles and responsibilities pertaining to the inadvertent discovery of cultural or historic artifacts during the construction and operation of the project.

- Prior to commencement of construction, WSF will contribute an amount of $5,000,000 to a yet-to-be-determined tribal mitigation fund that will be administered by the tribes.

- There are additional provisions pertaining to compliance by the parties with the terms of the MOA, resolving disputes, and otherwise reserving certain rights.

4.16 Hazardous Waste

4.16.1 Studies and Coordination

The following discussion is based on the hazardous waste discipline report (CH2M HILL, 1995), and supporting studies completed since the publication of the Draft EIS, including the *Phase I Environmental Site Assessment, Marina Beach Park* (CH2M HILL, 2000a), *Phase II Environmental Site Investigation, Edmonds Marina Beach Park* (CH2M HILL, 2000b), and the *City of Edmonds Sediment Investigation Report* (CH2M HILL, 2000c), which are incorporated into this EIS by reference.

The project approach consisted of a review of environmental information for the project footprint, including historical aerial photographs, historical land use maps (Sanborn maps), selected environmental regulatory agency records, and files and

available data for the existing UNOCAL property; interviews with selected knowledgeable persons; and a project site reconnaissance visit. Industrial properties, known contaminated sites, and other properties that may present potential sources of hazardous substances were further researched. During the site visit, existing land use, soil conditions, vegetation conditions, and other indicators of hazardous substance use, storage, or disposal were noted. The site visit did not include any subsurface investigation, and environmental media samples were not collected. This review does not constitute or replace a property-specific Environmental Site Assessment, as addressed in the American Society for Testing and Materials (ASTM) Standards Practice E 1527. The additional studies performed in 2000, listed above, focused on site conditions at the Preferred Alternative, the Point Edwards site, and included sampling and analysis of soils, groundwater, and marine sediments.

Study Methodology

Historical Aerial Photograph Review

Historical aerial photographs of the project area for the years 1947, 1955, 1967, 1976, 1981, 1985, 1989, and 1993 provided by Walker and Associates were reviewed. The photographs were studied for general land use patterns. Photocopies of the photographs and interpretations are included in the hazardous waste discipline report.

Historical Land Use Map Review

Historical land use maps of the project area produced by the Sanborn Company for the years 1909, 1926, and 1932 were reviewed. Sanborn maps are not available for later years. Map coverage does not extend to Point Edwards. The maps were studied for specific industries of possible concern located within the project area. Industries of possible concern included those that produced, used, stored, handled, or disposed of materials that could potentially contaminate environmental media such as soils, sediments, or groundwater.

Data Review

Agency databases and publicly available environmental reports on properties within the project area were reviewed. Data acquired from the studies completed since the publication of the Draft EIS, including the *Phase I Environmental Site Assessment, Marina Beach Park* (CH2M HILL, 2000a), *Phase II Environmental Site Investigation, Edmonds Marina Beach Park* (CH2M HILL, 2000b), *City of Edmonds Sediment Investigation Report* (CH2M HILL, 2000c), *Petroleum Hydrocarbon Investigation, South Marina, Port of Edmonds* (Landau & Associates, 1998) and the "Hazardous Material Survey, UNOCAL Dock" (Argus Pacific, 2001) were also reviewed and findings incorporated. Data sources are included in Appendix D.

Project Site Reconnaissance

A project site visit was conducted on June 2, 1995, with a follow-up visit to the Point Edwards site on July 2, 1996, to confirm, through visual examination, the previously identified activities and land uses associated with the use, storage, or disposal of hazardous substances. In addition, the project area was examined for visual evidence of additional sources of potential concern, such as current or past activities known to use hazardous substances. The following owner and occupant activities were reviewed during the site visit:

- Current or former fuel service stations or facilities
- Current or former fuel storage facilities
- Motor vehicle repair facilities
- Marine vessel repair facilities
- Machine shops
- Wood-finishing or preserving facilities
- Metal-plating facilities
- Commercial printing facilities
- Dry-cleaning facilities
- Process or recycling facilities
- Junkyards
- Agricultural and horticultural activities involving the use of pesticides

Other visual signs of environmental concern such as stained soils, dead or stressed vegetation, or unusual odors were also noted.

Coordination with Agencies and Other Groups

Knowledgeable persons, including site operators and regulatory agency staff, were interviewed to supplement the information gathered from the environmental regulatory agency database review and the project area visit.

Owner or operator representatives were contacted and interviewed by telephone for the existing UNOCAL bulk fuel terminal, the Port of Edmonds, and BNSFRR. Additional contacts and interviews were conducted with knowledgeable persons at the Ecology and the Edmonds Fire Department. A complete list of contacts is included in Appendix A.

4.16.2 Impacts

Impacts to Both Build Alternatives

Although the upper yard (former tank farm) of the Unocal site has been cleaned up, clean-up is still proceeding for the lower yard. The final clean-up action plan has not been developed, and methods and schedule for the UNOCAL Edmonds Bulk Fuel Terminal site are not definitive. Clean-up alternatives selected could include long-term on-site treatment of contaminated soils or groundwater. There would be the potential for release to the environment of hazardous substances used or transported during routine operation and maintenance of the facility.

Alternative 1: No Action

There would be the potential for release of fuel, motor oils, paints, or other materials used during routine operation and maintenance of the ferry terminal. The movement of people, vehicles, and materials to the ferry terminal across the railroad tracks without grade separation creates potentially unsafe conditions for ferry riders, as well as rail users. These conditions create the potential for a vehicle-train collision and potential derailment of railcars and subsequent release of hazardous substances to the air and to Puget Sound.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

Although substantial clean-up actions have occurred or are in progress at the UNOCAL property, the final clean-up methods and schedule for the existing UNOCAL property are not definitive. Clean-up alternatives selected could include long-term on-site treatment of contaminated soils or groundwater. Clean-up of the Port of Edmonds South Marina site, located immediately north of Marina Beach Park, has also not yet been completed, but, given Ecology's determination that the site presents a low potential threat to human health and the environment, this is not expected to impact the full buildout.

There would be the potential for release to the environment of hazardous substances used or transported during routine operation and maintenance of the facility.

Phase 1

Long-term operation impacts for this scenario would be similar to those described under full buildout.

Alternative 3: Mid-Waterfront Site

Full Buildout

At this time, the final clean-up methods and schedule for the UNOCAL Edmonds Bulk Fuel Terminal site are not definite. Ecology records do not confirm clean-up at the Port Edmonds Harbor Square site and South Marina site or property possibly owned by BNSFRR. Clean-up alternatives selected for the existing UNOCAL site or other properties where onshore portions of the multimodal center would be located could include long-term on-site treatment of contaminated soils or groundwater. In addition, dewatering may be required to maintain operation of the Dayton Street underpass. If contaminated groundwater is located under properties adjacent to that occupied by the Mid-Waterfront buildout, it may be drawn by pumping required for dewatering.

Ferry operation and associated propeller wash could possibly resuspend contaminated sediments in the vicinity of the ferry dock.

There would be the potential for release to the environment of hazardous substances used or transported during routine operation and maintenance of the facility.

Phase 1

Long-term operation impacts for Phase 1 would be similar to those described under full buildout. The possible dewatering to maintain operation of the Dayton Street underpass, and the resulting possible impacts from remaining contamination in groundwater at the Harbor Square development or BNSFRR property, would be deferred until full buildout.

4.16.3 Mitigation Measures

Mitigation measures that would be taken to control project impacts are summarized below; compliance with federal, state, and local requirements is assumed:

- Require that possible considered long-term on-site treatment of contamination will not pose a risk to public health or the environment. Require routine monitoring to assure no risk.
- Design project in a manner to avoid areas of known and unacceptable levels of contamination and, if avoidance is not possible, incorporate remedial measures into the project design that are protective of human health and the environment.
- Prepare and implement a spill prevention, countermeasures, and control (SPCC) plan for use in routine operation and maintenance.
- Incorporate capping of contaminated sediment areas or other remedial measures into design at the Mid-Waterfront site.
- If continual dewatering of Dayton Street underpass is required, and contaminated groundwater present on adjacent properties, prepare groundwater management plan to handle in accordance with according to federal, state, and local requirements.

4.17 Visual Quality

4.17.1 Studies and Coordination

The following discussion is based on the visual quality discipline report (CH2M HILL, 1995), which is incorporated into this EIS by reference and additional research conducted in 2002 and 2003.

Study Methodology

The study methodology used to evaluate the project's visual impacts follows methods developed by the FHWA and described in *Visual Impact Assessment for Highway Projects* (FHWA, 1981). The major components in the FHWA visual assessment process include the following four tasks: (1) define the visual environment of the project area; (2) assess visual resources; (3) identify major

viewer groups and evaluate viewer response (exposure and sensitivity) to visual resources; and (4) evaluate the project's impact on visual resources and the associated viewer response. The first three tasks define the baseline conditions against which impacts are measured in the fourth task. The degree of visual impact is determined by analyzing the changes in visual resources resulting from the proposed project alternatives and viewers' responses to these changes. The specific steps involved in each of these tasks are described in the visual quality discipline report.

Coordination with Agencies and Other Groups

Information from reviewed documents was confirmed through site visits as well as personal contacts with agency staff. The primary agency consulted for this visual analysis was WSDOT.

4.17.2 Impacts

Evaluation of long-term project impacts is based on a "key view" analysis. Key views were selected for each build alternative to represent the most sensitive viewer groups at the locations of greatest exposure. The degree of visual impact was determined by analyzing the change in visual resources (i.e., visual quality) resulting from the project, and the viewers expected response to these changes. Photographs of existing conditions were used to assist in assessing project impacts to visual resources. The locations of key views within the project area are shown in Figure 3-24 and are described in Table 4-20. Key views A through E depict existing conditions for Point Edwards. Key views F through H illustrate representative views at Mid-Waterfront.

Table 4-20
Key Views

Key View	Description
Modified Alternative 2 (Preferred Alternative): Point Edwards Site	
A	Looking northwest from proposed ferry holding and egress lanes
B	Looking southwest from interpretive overlook at Edmonds Marsh
C	Looking west from Marina Beach Park
D	Looking north from UNOCAL pier
E	Looking southwest from Port of Edmonds Marina walkway
Alternative 3: Mid-Waterfront Site	
F	Looking north from SR 104
G	Looking southwest on Sunset Avenue near Main Street
H	Looking northwest from Olympic Beach Park

Tables 4-21 and 4-22 present values assigned to determine the visual quality from the key view points with existing conditions and following project construction. Each visual quality score was then translated into a visual quality level using the five-point evaluation scale presented in Table 4-23.

Table 4-21
Visual Quality Matrix: Existing Conditions

	Modified Alternative 2 Key Views					Alternative 3 Key Views		
Criterion	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Vividness								
Landform	1	4	4	3	1	0	2	4
Waterform	1	2	4	4	2	0	0	5
Vegetative	1	3	2	2	1	1	1	2
Manmade	1	1	3	1	3	1	1	3
Average	1	2.5	3.25	2.5	2.3	0.5	1	3.5
Intactness								
Development	1	2	3	2	2	1	1	5
Encroachment	2	3	3	3	2	1	1	5
Average	1.5	2.5	3	2.5	2	1	1	5
Unity								
Manmade	1	2	3	2	2	1	1	5
Overall	2	2	4	4	2	1	1	5
Average	1.5	2	3.5	3	2	1	1	5
Total Visual Quality	1.3	2.3	3.3	2.6	2.1	0.8	1	4.5
Visual Quality Level	ML	M	MH	M	M	L	ML/L	H

Visual quality scores based on a 5-point scale ranging from low (0 to 1) to high (4 to 5) except for the "encroachment" category, where 0 = maximum level of visual encroachment and 5 = minimum level of visual encroachment (see Table 4-Z for a full breakdown of the point scale range.)

Visual quality level of definitions: H = High; MH = medium high; M = medium; ML = medium low; L = low

Table 4-22
Visual Quality Matrix: Future Conditions

	Modified Alternative 2 Key Views				Alternative 3 Key Views			
Criterion	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Vividness								
Landform	1	2	3	3	1	0	2	2
Waterform	1	2	3	4	2	0	0	2
Vegetative	1	2	2	2	1	1	1	2
Manmade	3	2	4	3	3	4	3	3
Average	1.8	2	3	3	2.3	1.3	1.5	2.3
Intactness								
Development	3	3	3	2	2	3	3	2
Encroachment	3	1	2	1	0	3	2	1
Average	1.5	2	2.5	1.5	1	3	2.5	1.5
Unity								
Manmade	3	3	3	3	1	3	2	2
Overall	3	2	3	1	2	2	2	2
Average	3	2.5	3	2	2	2.5	2	2
Total Visual Quality	2.6	2.2	2.8	2.2	1.6	2.3	2	1.9
Visual Quality Level	M	M	M	M	ML	M	M/ML	ML

Visual quality scores based on a 5-point scale ranging from low (0-1) to high (4-5) except for the "encroachment" category, where 0 = maximum level of visual encroachment and 5 = minimum level of visual encroachment. (See Table 4-Z for a full breakdown of the point scale range.)

Visual quality level of definitions: H = High; MH = medium high; M = medium; ML = medium low; L = low

Table 4-23
Visual Quality Evaluation Scale

Total Visual Quality Score	Visual Quality Level
0.0 to 1.0	Low
1.0 to 2.0	Medium-low
2.0 to 3.0	Medium
3.0 to 4.0	Medium-high
4.0 to 5.0	High

Changes in visual quality were measured by comparing pre-and post-project visual quality levels. For example, if an existing view was determined to have overall medium visual quality and the proposed project would produce medium-high visual quality for the same view, then there would be an increase or general improvement in visual quality.

Alternative 1: No Action

Under the No Action Alternative, none of the visual impacts described below for the build alternatives would occur. Without the proposed project, traffic volumes on local roadways in the project area would increase, thereby intensifying the existing visual sense of congestion. Modifications to the existing ferry pier that improve visual quality would not occur, primarily the removal of pedestrian-related structures from the top of the pier.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

Modified Alternative 2 would be located within the Point Edwards and South Waterfront landscape districts. It would be visible to a number of sensitive viewer groups. There are a few Woodway residences located on the Point Edwards bluff that would have closer views of ferry boats under this alternative than currently possible and could have a slight view of the end of the relocated ferry terminal along the southern breakwater of the Port of Edmonds Marina. The bigger impact of the proposed project on these Woodway residents would be the removal of the UNOCAL pier, which would enhance the view from the Woodway residences more than the new ferry pier along Port of Edmonds breakwater would detract because of UNOCAL pier's more direct visibility. The proposed project would have no net effect on the existing visual quality for the small number of affected Woodway viewers. The Point Edwards Alternative would have little effect on views from residential areas on the east slope of the Edmonds basin. It would be screened from view or would lie within the middle ground of views from this area and the proposed improvements would not substantially change the character of the Point Edwards and South Waterfront landscape units, as viewed from this distance and perspective**.** Modification of the existing Main Street terminal would slightly improve views from the immediate area because removal of the ferry-related structures would open up views to the mountains to a greater degree. Specific visual impacts at each of the key views are described in more detail below.

Key View A

Key view A would be generally representative of future on-site views for motorists traveling westbound towards the multimodal center, as well as motorists waiting in the ferry holding lanes (Figure 4-18). Motorists parked in the holding lanes would have the greatest short-term exposure to development on the Point Edwards site, but would be only moderately sensitive to changes in the visual environment.

Key View A

Key View B

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Figure 4-18

Key Views A (Northwest) and B (South):
Point Edwards Site (Preferred Alternative)

At present, there are few distinct visual features in this view. The foreground view toward the water is encroached upon by overhead electrical transmission lines and

scattered low-rise buildings covering the Point Edwards lower yard; these encroaching features contribute to the site's overall low intactness. There is little on-site vegetation. Puget Sound and the Kitsap Peninsula are visible in the distant background of this view. This existing view has medium-low visual quality.

With implementation of the Point Edwards Alternative, the immediate foreground area would remain open roadway, but the existing on-site buildings would be replaced with the proposed multimodal center. The two-story multimodal center parking garage would occupy the foreground view. Views of the water would be more expansive than depicted in Figure 4-18 because the proposed roadway would be higher than where the photograph was taken. In addition, the garage's low, horizontal silhouette would unify the visual coherence of the existing built environment by establishing a continuous linear form across the site. The intactness of the built environment would also improve with removal of the overhead transmission lines that currently encroach upon the existing view. Views of the project from this vantage would have medium visual quality and would represent an improvement over existing conditions.

Key View B

At present, the foreground view, shown in Figure 4-18, is dominated by open, natural wetland vegetation and the forested slope of the Point Edwards uplands. This natural setting is encroached upon by the ancillary facilities (e.g., buildings, pipe racks) located in the lower yard and the exposed soil that remains following excavation of the UNOCAL storage tanks (along the uplands). Overhead electrical transmission lines are also present in the foreground. The Kitsap Peninsula is partially visible in the background of this key view. The built environment and natural features are intermixed and incoherent. This existing view has overall medium visual quality.

To viewers along the perimeter of Edmonds Marsh, the proposed project would result in a decrease in existing visual quality. The proposed multimodal center would introduce large, low-rise structures (i.e., terminal, parking garage, pedestrian platforms) approximately 40 feet high into the foreground of this view.

Although the project would provide more unity to this view, the proposed buildings would block distant views of the Kitsap Peninsula and would dominate views from the marsh.

The unnatural horizontal lines of the cut along the hillside for ferry holding/egress lanes would be emphasized by the proposed ferry holding/egress lanes and retaining walls that would extend midway across the Point Edwards uplands. The ferry access road and retaining walls would create a visual scar across this hillside. These negative visual effects could be mitigated through landscaping.

No site-specific landscape plans for the proposed project have been developed. However, according to preliminary illustrative site plans prepared for both build

alternatives (Hewitt Isley, 1995), the fill slopes on the south side of the proposed ferry access road would be revegetated. Landscaping would also be provided around the perimeter of the multimodal center. As the new on-site vegetation matures and screens the road and structures behind it, visual quality would improve to medium over conditions immediately following construction. The level of visual quality would remain unchanged as compared to existing conditions.

Key View C

Key View C depicts views from Marina Beach Park looking west toward the water (Figure 4-19). At present, the foreground view is occupied by the Marina Beach Park's open lawn and shoreline, but is dominated by the UNOCAL pier that extends into Puget Sound. The distant background of this view is framed by the Kitsap Peninsula and on clearer days, the Olympic Mountains. The existing visual quality is medium-high.

To users of Marina Beach Park, the proposed project from this vantage point to the south would result in increased visual quality. Views of Puget Sound would be more expansive because the UNOCAL pier would be removed, eliminating the obstruction of views to Puget Sound and the Kitsap Peninsula to the southwest, thereby expanding and unifying the view (Figure 4-19). Views of Puget Sound, Kitsap Peninsula and Port of Edmonds Marina to the north are discussed for Key View D. Key View C, however, would have slightly more impact on viewers than Key View D, because Key View C would be the first impression that recreationists would have as they enter the park. Due to the loss of views to the north and the introduction of the ferry pier, this area would have medium visual quality, resulting in a decrease from existing conditions.

Key View D

Key View D depicts views from Marina Beach Park looking north toward the Port of Edmonds Marina (Figure 4-20). At present, the foreground and middle-ground views are occupied by the Marina Beach Park's open lawn and shoreline. The dry storage racks, foot bridge, and boat sheds are in the background behind the park. The distant background of this view to the north and west is framed by the Puget Sound and Kitsap Peninsula and, on clearer days, the Olympic Mountains. The existing visual quality is medium.

To users of Marina Beach Park, the proposed project would result in a decrease in visual quality from this vantage point. The ferry pier structure and elevated walkway would dominate the horizon. The proposed overwater structures would encroach upon the visual integrity of this shoreline area and block some scenic views for this highly sensitive viewer group. Views from this vantage point in the park would be of medium visual quality, which would maintain the existing quality.

Key View E

Key View E shows the view from the pedestrian walkway in the Port of Edmonds Marina/Central Waterfront District towards the southwest (Figure 4-21). On clear days the Olympic Mountains and Kitsap Peninsula are visible in the background.

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Figure 4-19

Key View C: Existing Conditions and Simulated Future View from Marina Beach Park Looking West

154090.G1.02.A1_T07200106SEA • 4-19 Key View C • 2/27/03 • dk

Existing

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

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Figure 4-20

Key View D: Existing Conditions and Simulated Future View from UNOCAL Pier Looking North

154090.G1.02.A1_T07200100SEA • 4-20 Key View D • 2/27/03 • dk

EDMONDS CROSSING

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Figure 4-21

Key View E: Existing Conditions and Simulated Future View from Edmonds Marina Looking South

154090.G1.02.A1_T07200100SEA • 4-21 Key View E • 2/27/03 • dk

Views of Puget Sound to the west are intermittent between the boat sheds. The dry stack storage obstructs the view to the forested Edmonds bluff and detracts from the integrity of the setting. The visual quality of this view is medium.

To users of the Port and the pedestrian walkway, the proposed project would decrease the visual quality of the marina. The elevated ferry pier and overhead walkway would cross through the bottom of the horizon, blocking distant views of the scenery behind and dividing the landscape into three elements: marina, proposed structure, and sky. The effect would be a diminished sense of expanse; however, after pedestrians crossed beneath the elevated structures, they would be treated with an unified and expansive view of the Puget Sound not possible without the removal of the UNOCAL pier. Views from this location in the marina would have a medium-low visual quality. This would be a decrease in visual quality from existing conditions.

Ferry Rider Views

The Point Edwards Alternative would provide better views from the ferry facilities than either the No Action or the Mid-Waterfront Alternative. The location of the Point Edwards access roadway/holding lanes and ferry pier would provide views of Puget Sound and Edmonds. The access roadway/holding lanes would be at an elevation that would make distant views of Puget Sound and mountains to the north-northwest possible, as well as views of the city. The duration of these views would vary. During peak travel periods, when the access roadway would be used as holding lanes, the duration would be longer and ferry riders could exit their vehicles to get the best views possible. At nonpeak times, the views would only be seen in passing. Because the ferry pier would cross over a small portion of Marina Beach Park and the Port of Edmonds Marina, unobstructed views of the water and mountains to the west and south would be possible. Views to the north would be obstructed by the pedestrian walkway.

The ferry would approach the terminal from the north-northwest. As ferry riders approached the pier from the water, they would have views of the Edmonds marina in the foreground, the forested Point Edwards uplands in the middleground, and the eastern slope of Edmonds in the background. As the ferry approached the pier, these views would be diminished as the pier and ancillary facilities, such as the dolphins and the pedestrian walkway, obstructed more and more of the view. Walk-on passengers would be the most affected by these obstructions because most potential viewers would be in their vehicles.

Phase 1

The overall visual impacts of Phase 1 would be somewhat less than for full project build-out. Only two piers would be constructed to access two ferry slips. There would also be one overhead-loading structure, which would diminish the obtrusiveness of the proposed structure as viewed from the South Waterfront District/Marina Beach Park. The Phase 1 improvements would decrease the visual quality of the South Waterfront District when looking to the north but would increase the visual quality when looking to the south, creating no net change. Phase 1 would diminish the visual quality of the Central Waterfront District and would

marginally improve one area and degrade another area of the Point Edwards District. These impacts are similar to, but less than, those of full buildout.

Alternative 3: Mid-Waterfront Site

Full Buildout

Alternative 3 would be located within the Point Edwards, Central Waterfront, North Waterfront, and Central Commercial landscape districts. It would be visible to a number of sensitive viewer groups. Existing conditions are shown in Figures 4-22 and 4-23. Where residences within the east slope of the Edmonds basin and mixed-use district have views of the site, views will generally improve. The Multimodal Center will improve the visual quality of the central commercial area, and the new ferry pier will be far enough away that it will largely blend with the existing waterfront development. Modification of the existing Main Street pier by removing the ferry-related structures will improve views toward the mountains from the immediately adjacent areas. Specific visual impacts at the key views are described in more detail below.

Key View F

At present, the foreground view is dominated by the expansive open roadway, while views of the Harbor Square development to the west are partially screened by vegetation (Figure 4-22). Existing low-rise commercial development set back from the intersection of SR 104 and Dayton Street and overhead street and traffic lights also occupy the foreground. This existing view has low visual quality because it lacks any coherence; the natural and built elements lack integrity; and there are no memorable features.

The proposed multimodal center would introduce a new building complex, up to approximately 40 feet tall, into a visual environment characterized by low-rise development set back from the street. The eastern and southern sides of the complex would unify the visual coherence of the existing built environment by establishing defined edges along SR 104 and Dayton Street, respectively, that would create a partial sense of enclosure to these roadways. In addition, the proposed rotunda at the northwestern corner of SR 104 and Dayton Street would establish a vivid landmark that could enhance the gateway aspect of entering downtown Edmonds from SR 104. Overall, the proposed multimodal center at Mid-Waterfront would enhance the existing visual quality of the local built environment. Views of the project from this vantage would have medium visual quality—an improvement from existing conditions.

Key View G

At present, the foreground view is characterized by low-rise commercial development set back from SR 104 and surrounded by surface parking and intermittent vegetation (Figure 4-22). The forested slope of the Point Edwards uplands is visible in the middle ground of this view. Overhead traffic lights and

Key View F

Key View G

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Figure 4-22

Key Views F (North) and G (South)

Mid-Waterfront Site

electrical transmission lines encroach upon this view. The view lacks any memorable elements, has no clear development pattern, and has no unifying factors. It has an overall medium-low/low visual quality.

Development of the multimodal center under the Mid-Waterfront Alternative would introduce a new building complex into the middle ground of key view G. The proposed multimodal center would replace one of the existing low-rise commercial buildings with a one-story bus terminal and two-story parking structure that would enhance the unity of the existing built environment by creating a defined edge along the western side of SR 104. Because the proposed structure would be approximately the same height as the surrounding buildings, this center would not block middle ground views of the Point Edwards uplands. The proposed scale and massing of the multimodal center would be slightly larger than other buildings in this district but would be visually compatible with the scale of the area. Implementation of Mid-Waterfront Alternative should improve visual quality at this vantage point from medium-low/low to medium-low/medium. The degree of improvement would depend on the architectural design, detailing, and compatibility with the area character.

Key View H

As Figure 4-23 shows, the foreground is presently dominated by a plaza leading to the park shoreline, which provides expansive, unobstructed views of Puget Sound.

The Kitsap Peninsula is visible in the distant background. This existing view has high visual quality.

Development of the proposed ferry pier at Mid-Waterfront would result in an overall decrease in visual quality. The proposed project would introduce a new overwater structure that would encroach upon the visual integrity of an existing open shoreline. This new structure would block existing views of the water and distant mountains from the park and adjacent fishing pier, as well as from adjacent residential complexes, and would degrade the overall vividness of these natural features. Views of the project from this vantage would have only medium-low visual quality for these highly sensitive viewer groups, which is a substantial decline from existing conditions.

Ferry Rider Views

The Mid-Waterfront Alternative would provide better views from the ferry facilities than the No Action Alternative but not the Point Edwards Alternative. Like the Point Edwards Alternative, the access roadway/holding lanes along the base of the UNOCAL hillside would be at an elevation that would make distant views of Puget Sound and mountains to the north-northwest possible as well as views of downtown and the eastern slope of the city. The duration of these views would be limited. Most of the time these views would only be seen in passing as motorists were driving to the tollbooths. Only during the highest peak travel periods would it be likely that vehicles would be waiting on this portion of the access roadway. The elevation of the roadway as it would parallel the railroad track would make scenic views impossible. Views from the Mid-Waterfront Alternative ferry pier would be

Key View H

EDMONDS CROSSING

Connecting ferries, bus & rail

Figure 4-23

Key View H (West)

Mid-Waterfront Site

similar to the Point Edwards Alternative, except the Port of Edmonds Marina would be in the foreground. Otherwise, views of the water and mountains to the west and south would be open and views to the north would be obstructed by the pedestrian walkway.

Similar to the Point Edwards Alternative, the ferry would approach the Mid-Waterfront Alternative pier from the northwest. As ferry riders approached the pier from the water, they would have views of Brackett's Landing and other waterfront development, including the Edmonds Marina in the foreground, while the eastern slope of Edmonds would be in the background. As the ferry approached the pier, these views would be diminished as the pier and ancillary facilities, such as the dolphins and the pedestrian walkway, obstructed more and more of the view. Pedestrian passengers would be most affected by this limited view because almost all of the vehicle passengers would not have a view from their vehicles on the car decks.

Phase 1

The visual impact of the Phase 1 Scenario for the Mid-Waterfront Alternative would be similar to full build-out for this alternative, except at the location of the multimodal center. The roads and ferry pier would be in the final location, but narrower in width. The overhead walkway would also be constructed similar to its final configuration. The adverse impacts of the access road and pier would, therefore, be slightly less than, but similar to, full buildout.

At the location of the multimodal center, the existing train station would be retained. The other existing buildings, which are undistinguished architecturally, and paved parking would be demolished and replaced with a bus shelter and turnaround, and new surface parking lot. The parking structure and terminal buildings would not be constructed. This option would result in a small improvement over the existing conditions. The greatest visual improvement would be that the new parking lot would be better screened by buffer landscaping than the existing lots.

Summary of Impacts

Table 4-24 compares visual quality levels between existing and project conditions from key views under the two build alternatives.

Compared with existing conditions, the build alternatives would change the visual character and visual quality of the project area. The project's largest negative effects on visual quality would be along the shoreline (key Views C and H). The Point Edwards Alternative would increase the visual quality of the South Waterfront District to the south and southwest and decrease the visual quality of the South Waterfront District to the north. Overall, the increased visual quality would have the greatest impact on recreationists because this would be their first impression of the South Waterfront District and Marina Beach Park as they approach the park from the marina to the north or from the parking lot to the east. The visual quality of the Central Waterfront District would diminish with the Modified Point Edwards Alternative. The Mid-Waterfront Alternative would negatively affect the north

waterfront and the central waterfront districts. Mid-Waterfront would have the greatest impact on visual quality along the waterfront because it would substantially affect views from Olympic Beach Park and shoreline residences that are currently unimpeded by existing overwater development. The pier at Mid-Waterfront is proposed for an area that currently is open water.

Table 4-24
Summary of Visual Quality Impacts

Key View	Visual Quality Level Existing Condition	Visual Quality Level Project Condition
Modified Alternative 2: Point Edwards Site		
A	ML	M
B	M	M
C	MH	M
D	M	M
E	M	ML
Alternative 3: Mid-Waterfront Site		
F	L	M
G	ML/L	ML/M[b]
H	H	ML

Notes:

H *high*

MH *medium-high*

M *medium*

ML *medium low*

[a]*Initially following construction the visual quality would decrease; however, as proposed vegetation matured, the visual quality would improve to medium.*

[b]*Change in visual quality would depend on architectural design of new buildings.*

Both build alternatives would generally improve visual quality at the locations of the proposed multimodal center because they would replace development that currently detracts from the overall visual integrity of the project area's built environment. The Point Edwards Alternative would improve the visual quality of the Point Edwards district at the location of the multimodal center that is offset by the unnatural horizontal cut along the vegetated hillside of the existing UNOCAL site. Mid-Waterfront would also create this cut along the hillside for its access road, and would improve the quality of the central commercial district and views toward this district. Both the Mid-Waterfront and the Point Edwards Alternatives would improve the views to the south and west of Marina Beach Park with the removal of the UNOCAL pier.

The visual quality of the existing ferry pier would improve as a result of either build alternative. The Mid-Waterfront Alternative would have the greater overall impact to visual quality. It would have a greater adverse impact along the waterfront than the Point Edwards Alternative and a similar impact on the Point Edwards hillside. However, the Mid-Waterfront Alternative would also have the greatest potential to improve the visual environment by enhancing the highly visible central commercial district.

4.17.3 Mitigation Measures

Design of the facilities is at a conceptual level. Once an alternative is chosen and the detailed appearance of the multimodal facility is developed, color, texture, and line would be used to blend the facilities with their surrounding. Also, as design and planning progress, the WSDOT Roadside Classification Plan, which classifies SR 104 as semiurban and urban in Edmonds, and the Roadside Manual would be consulted to guide the design and development of the vegetation for the proposed project.

Ferry Pier

Although, under both build alternatives, view blockage impacts resulting from the new ferry piers could be mitigated by lowering the proposed structures, this would not be possible because of operational constraints, such as crossing the railroad tracks, meeting ADA requirements, and limiting overwater shading. Impacts, however, could be mitigated through the use of color and vegetation. For example, the color scheme of the structures on top of the piers, including the overhead walkway, would be largely muted blues and greens or other colors that are consistent with existing waterfront development, marine environment, and scenic landscape features visible beyond the terminal, such as the Olympic Mountains. Also, vegetation in keeping with the character of the surrounding area would be placed at the base of the ferry pier's concrete supports to humanize their scale by bringing the viewer's attention down more towards eye level and blend with the surrounding environment. The enclosure for the overhead walkways would consist of translucent materials to reduce the obtrusiveness of the structures.

Access Roadway

To reduce the impact of the horizontal road cut along the existing UNOCAL hillside for the access roadway under both build alternatives, landscaping similar to the more natural character of the hillside would be planted along the retaining wall. As the vegetation matured, the roadway would not stand out as much from the surrounding environment. The whole of the access roadway would be designed and maintained in accordance with the WSDOT Roadside Classification Plan and Roadside Manual.

Multimodal Center

As mentioned previously, the architectural design of the proposed multimodal center is currently under development for both build alternatives. The location for the multimodal center at Point Edwards (UNOCAL district) or Mid-Waterfront

(central commercial district) and the adjacent areas do not have a strong architectural character or context. As a result, there is some latitude in the design of these facilities. Nevertheless, the forms, materials, details, and colors of the architecture would be compatible with the general area context, including the waterfront and existing Edmonds development. The multimodal center in Mid-Waterfront is located in a more visible and urban setting and this large structure would therefore be designed with sensitivity to the smaller scale of the surrounding area.

Landscaping at the multimodal centers would also reflect the surrounding environment. For the Point Edwards Alternative, the landscape design would draw on the vegetation types found in Edmonds Marsh and along the hillside. Landscaping for the Mid-Waterfront Alternative would relate to the urban character of this area and would help reduce the scale of the proposed multimodal center and enhance the urban environment (e.g., street trees).

Phase 1

The Phase 1 surface parking lots at the multimodal centers would be screened with landscaping in both build alternatives. Landscaping would meet the requirements of Chapter 20.12 of the Edmonds Community Development Code. The code requires landscaping around the parking lot perimeter and within its interior.

4.18 The Relationship Between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

With any development project there are tradeoffs between impacts on the natural and built environments and the resulting project-related benefits. Each of the build alternatives considered in this EIS has similar, albeit varying, impacts that are common for large-scale improvement projects, including changes in traffic patterns; economic changes; increased traffic noise; changes in the visual environment; and changes to or loss of natural areas such as wetlands and wildlife habitat. These impacts, however, are not considered to outweigh the long-term benefits of the project. The proposed improvements are designed to meet future travel needs of the local community and the larger region that have been identified as resulting from projected growth and development trends. The project is expected to result in a long-term improvement in ferry access and service, multimodal linkages, and public safety, and new opportunities for downtown Edmonds waterfront development. It can be concluded, therefore, that the local short-term impacts and use of resources by the proposed project are consistent with the maintenance and enhancement of long-term productivity for the Puget Sound community.

4.19 Irreversible and Irretrievable Commitments of Resources That Would Be Involved in the Proposed Action

Implementation of the proposed action would involve the commitment of a range of natural, physical, human, and fiscal resources. The acquisition and use of land for

the proposed improvements is considered an irreversible commitment during the period of the time that the land is used for a transportation facility. If a greater need arises for use of the land or if the facility is no longer needed, the land could be converted to another use. At present, there is no reason to believe such a conversion will ever be necessary or desirable. Implementation of the proposed project would not jeopardize the continued existence of federally listed (ESA-protected) species.

Considerable amounts of materials, labor, and energy would be expended during construction. These resources are generally not retrievable. Some of the materials, however, could be salvaged in the future when the life of the facility is completed and/or the facility is demolished. The resources used in the construction of the proposed facility are not in particularly short supply, and their use would not have an adverse effect on the continued availability of these resources.

Construction would require a substantial expenditure of both state and federal funds, which are not retrievable. Operation and maintenance of the proposed facility would also commit energy, human, and fiscal resources over the life of the facility. The commitment of these resources is considered irretrievable.

The commitment of resources for the proposed project is based on the concept that the residents of the project area and the larger regional community would benefit by the improved quality of the transportation system. These benefits would consist of improved ferry access and service, enhanced multimodal linkages, and greater public safety, and new opportunities for the Edmonds downtown/waterfront development.

4.20 Construction Activity Impacts

4.20.1 Air Quality

Impacts

Alternative 1: No Action

There would be no project-related air quality construction impacts under the No Action Alternative.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

Impacts to air quality from construction activities would be short-term in duration and fairly localized in the vicinity of the construction activities. Construction activities primarily generate particulate matter (PM_{10} and $PM_{2.5}$), as well as small amounts of CO, VOC, SO_2 and NO_X from construction machinery exhaust and vehicular traffic delayed in construction zones. Specific sources of particulate include dust from earth-moving excavation activities (termed fugitive dust). These would consist primarily of dust emissions caused by earth-moving activities during the upland grading phase for both the realigned SR 104 and the multimodal center, but would also include emissions from construction vehicles and equipment.

Reworking of the Pine Street/SR 104 intersection would also have a short-term impact on air quality, both from construction activities and from temporary traffic delays that could increase vehicle emissions.

Alternative 3: Mid-Waterfront Site

Full Buildout

Impacts would be similar to those for Point Edwards, although additional construction time may be required for the construction of the Dayton Street underpass, thereby increasing the duration of air quality impacts from construction activities. Also, additional dust emissions may result from demolition of existing buildings. This alternative would result in more substantial disruptions to local traffic, so delays could result in elevated concentrations of CO from more idling vehicles. Again, such impacts would be temporary and short-term.

Mitigation Measures

The PSCAA enforces air quality regulations in Snohomish County, including those for controlling fugitive dust (Regulation 1, Section 9.15). Contractors engaged in construction activities must comply with this regulation, which requires using the best available control technology to control fugitive dust emissions. Controls used to meet this standard may require the following actions:

- Use water spray as necessary to prevent visible dust emissions, particularly during demolition of brick or concrete buildings by mechanical or explosive methods.
- Minimize dust emissions during transport of fill material or soil by wetting down or by ensuring adequate freeboard on trucks (space from the top of the material to the top of the truck bed).
- Promptly clean up spills of transported material on public roads by frequently using a street-sweeper machine.
- Cover loads of hot asphalt to minimize odors.
- Schedule work tasks to minimize disruption of the existing vehicle traffic on streets.
- Keep all construction machinery engines in good mechanical condition to minimize exhaust emissions.
- Locate construction equipment and truck staging areas away from sensitive receptors as practical and in consideration of potential impacts to other resources.

Also, as necessary and in accordance with standard practice, the following measures may be employed to reduce potential impacts to air quality:

- Spray exposed soil with water or other suppressant to reduce emissions of PM_{10} and deposition of particulate matter.

- Cover all trucks transporting materials, wetting materials in trucks, or providing adequate freeboard to reduce PM_{10} and deposition of particulates during transportation.

- Provide wheel-washers to remove particulate matter that would otherwise be carried off site by vehicles to decrease deposition of particulate matter on area roadways.

- Remove particulate matter deposited on paved, public roads, sidewalks, and bicycle and pedestrian paths to reduce mud and dust.

- Cover dirt, gravel, and debris piles as needed to reduce dust and wind-blown debris.

- Route and schedule construction trucks to reduce delays to traffic during peak travel times to reduce air quality impacts caused by a reduction in traffic speeds.

4.20.2 Noise

Noise sources and their impacts in the City of Edmonds are governed by Chapter 5.30, *Noise Abatement and Control*, of the Edmonds City Code. The code sets maximum permissible environmental noise levels that cannot be exceeded in any 1-hour period. The maximum noise levels vary, depending on the classification of the receiving property and the noise source. The district classification of a property (residential, commercial, etc.) in the City of Edmonds is based on the property's zoning.

Between the hours of 10:00 P.M. and 7:00 A.M., permissible noise levels are reduced by 10 dBA for receiving properties within residential districts. The City of Edmonds regulations allow the maximum permissible sound levels to be exceeded by a sound that is of short duration. Construction-generated noise at receiving properties in residential districts is exempt from regulation between the hours of 7:00 A.M. and 10:00 P.M. on weekdays and between the hours of 10:00 A.M. and 6:00 P.M. on weekends and holidays.

Noise sources in the Town of Woodway are governed by Chapter 7.28, "Noise Disturbances," of the Woodway City Code. The code states that no noise disturbances shall be created between the hours of 10:00 P.M. and 7:00 A.M. on weekdays and between 12:00 A.M. and 8:30 A.M. on Saturday and Sunday. No noise levels limits are set for daytime hours.

Impacts

Alternative 1: No Action

There would be no project-related noise construction impacts under the No Action Alternative.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

Ferry Pier and Multimodal Center Construction. Pier construction for the Point Edwards Alternative would involve removal of the existing UNOCAL pier and construction of the new ferry pier, pedestrian walkway, and multimodal center. The new ferry pier would be constructed with steel and concrete piling driven by a floating derrick, followed by construction of the concrete deck. Pile-driving would be the most likely construction activity to create relatively high noise levels. Pile-driving would only occur over water, west of the shoreline. Excavated columns would be used to support the deck structure from SR 104 to the shoreline, and, therefore, no pile-driving would occur east of the shoreline. Typical noise levels that would occur during construction of the pier and multimodal center at a distance of 50 feet would range from 88 to 105 dBA maximum noise level (L_{max}). If construction occurs during daytime hours (7:00 A.M. to 10:00 P.M.), construction noise levels are exempt from noise regulations in both the City of Edmonds and the Town of Woodway. If construction occurs during nighttime hours, noise levels from construction activities would exceed these noise regulations at receivers nearest the construction activity, namely live-aboard boats in the South Marina and at Marina Beach Park.

Roadway Construction. Estimates of construction noise levels were made using the methods described in *Highway Construction Noise: Measurement, Prediction, and Mitigation* (USDOT, 1977). Under both build alternatives, construction activities would occur throughout the project area. Existing residences and commercial structures within 50 feet of roadway construction would receive estimated L_{max} noise levels from 88 to 92 dBA. As previously noted, daytime construction noise would be exempt from regulations in either Edmonds or Woodway. Any nighttime construction activities would exceed these noise regulations at receivers nearest the construction activities.

Alternative 3: Mid-Waterfront Site

Full Buildout

Ferry Pier and Multimodal Center Construction. Pier and multimodal center construction for the Mid-Waterfront Alternative would involve demolition of existing buildings before construction of the proposed facilities. Impacts would be the same as those for Point Edwards, except that the impacts would be shifted to areas in the North Marina and Olympic Beach Park.

Roadway Construction. Roadway construction impacts for Mid-Waterfront would be the same as those for Point Edwards.

Mitigation Measures

Offsetting the relatively high construction noise levels associated with the build alternatives is the fact that the construction would be of short duration. These noise levels would be less the farther away the receiver is from the source. Construction operations would be conducted from 7:00 A.M. to 10:00 P.M. on weekdays and

from 10:00 A.M. to 6:00 P.M. on weekends. If work were to be performed during non-exempt hours, a noise variance would be required from the local municipalities. All construction activities shall be in compliance with the Edmonds City Code, Chapter 5.30, and the Town of Woodway Code, Chapter 7.28.

4.20.3 Energy

Estimates of construction-related energy impacts were based on the input-output method also outlined in *Energy and Transportation Systems* (CALTRANS, 1983). The method provides an estimate of the amount of energy used to manufacture materials and operate equipment needed to build the facility. The method considers the following three factors:

- Energy used in mining and processing raw materials and manufacturing building materials
- Energy used to transport materials to the construction project
- Energy used during construction of the facility

The method consists of identifying an appropriate Btu-per-dollar conversion factor that is then multiplied by the estimated construction cost for each alternative. The method requires converting construction costs in 2003 dollars to a 1977 dollar basis. This conversion was conducted using data from California Department of Transportation's (CALTRANS) *Summary Price Index for Selected Highway Construction Items* (Weygandt, pers. comm., 1995). Construction costs in 1977 dollars were then multiplied by a conversion factor of 25,100 Btu per dollar (for urban conventional highway projects) provided by CALTRANS (1983).

Impacts

The impacts of energy use during construction for each alternative are shown in Table 4-25. As shown, energy use during construction would be slightly higher under the Mid-Waterfront Alternative than the Point Edwards Alternative. This difference is directly related to the difference in construction costs between the two scenarios.

Alternative 1: No Action

There would be no project-related energy construction impacts under the No Action Alternative.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

As shown in Table 4-25, construction-related energy impacts are estimated to be about 12.5 million gallons of fuel or 1,567 billion Btu.

Alternative 3: Mid-Waterfront Site

For Mid-Waterfront Alternative, construction-related energy impacts are estimated to be about 12.9 million gallons of fuel or 1,617 billion Btu. The Mid-Waterfront Alternative is estimated to consume approximately 3 percent more fuel during construction than the Point Edwards site.

Table 4-25
Energy Use During Construction

Alternative	Total Construction Costs ($2003)[a]	Total Construction Costs ($1977)[b]	Btu/$1977[c]	Energy Consumed (billion Btu)	Energy Consumed (gallons of fuel)[d]	Index Alt 2A = 100
Alternative 1: No Action	$0	$0	NA	NA	NA	NA
Alternative 2: Point Edwards Site						
Phase 1	$107,600,000	$40,634,441	25,100	1,020	8,159,396	
Phase 2	$57,700,000	$21,790,030	25,100	547	4,375,438	
Total Plan A	$165,300,000	$62,424,471	25,100	1,567	12,534,834	100
Alternative 3: Mid-Waterfront Site						
Phase 1	$116,800,000	$44,108,761	25,100	1,107	8,857,039	
Phase 2	$53,800,000	$20,317,221	25,100	510	4,079,698	
Total	$170,600,000	$64,425,982	25,100	1,617	12,936,737	103

Notes:
Btu British thermal units

[a]CH2M HILL, 2003.
[b]Weygandt, 1995.
[c]CALTRANS, 1983.
[d]1 gallon of gas = 125,000 Btu. ODOT, 1991.

Mitigation Measures

There are a number of techniques that can be used during planning, scheduling, and actual construction of the project to save energy. Many of these techniques, such as transporting equipment and operating vehicles in non-peak hours, can also help reduce construction costs. Other energy-saving procedures that would be used during construction include the following:

- Turning off vehicles and equipment during periods of non-use rather than idling
- Recycling and reusing materials from demolished structures (such as asphalt, concrete, metal, and wood)

4.20.4 Geology and Soils

Impacts

Alternative 1: No Action

There would be no project-related earth resources construction impacts under the No Action Alternative.

Impacts Common to All Build Alternatives

All of the build alternatives would require clearing land, removing organic materials (including topsoil), cutting slopes, filling roadway embankments, and constructing upland and offshore structures associated with the multimodal center, the ferry pier, and landing facilities. Exposure of soils during excavation would increase the potential for erosion and downslope movement of surface soils

Soils in the project area would likely be excavated with conventional earthmoving equipment. Excavated material suitable for fill would be stockpiled at approved sites for use on the fill areas of the roadway section. These materials would generally be limited to sand and gravel soils.

Excavated topsoil and organic soils would be stockpiled for post-construction landscaping. The remaining excavated material would require disposal. Suitable disposal locations off site would need to be identified before construction begins.

Increased noise, dust, and traffic from hauling fill and excavated materials are temporary impacts that could occur in the project vicinity. The magnitude of these impacts would depend on the location of borrow and waste sites, land uses along haul routes, the duration of hauling operations, and construction schedule. Impacts from transport of materials to and from the site would most likely occur on SR 104.

Shallow groundwater would likely be encountered in the lower elevation areas of the site. Dewatering would be required for excavations below groundwater levels (for example, the Dayton Street underpass at Mid-Waterfront). Permanent drainage

systems would be necessary to maintain stability of retaining structures. These systems could affect groundwater levels and flow on a local level (see Section 4.20.5, Waterways and Hydrological Systems). These systems could also potentially impact nearby wetlands (see Section 4.20.7, Wetlands).

Roadway Alignment on Hillside

Transitional bed soil deposits are likely to occur on the hillside where the access roadway alignment would cut into the slope. These deposits generally provide adequate subgrade support for roadways and embankments, but landslides may occur if the ground is cut to a steeper slope. Transitional beds are associated with several landslides in the area and therefore would require particular attention during design and construction. The erosion hazard associated with the landslide hazard areas is moderate to high. Substantial erosion and sediment transport could result if these soils are exposed.

Excavation and filling would result in substantial changes in the shape of the ground surface along portions of the access road alignment on the hillside at the southern end of the project area. Cuts up to about 30 feet) deep are currently being considered. Detailed subsurface exploration and engineering analyses will be required during the design phase to evaluate proposed cuts and fills on steep or unstable slopes. Retaining structures, slope grading, mechanically stabilized earth walls, or other slope protection would be necessary in these areas. Much of the transitional beds may not be suitable for use as structural fill because of the potentially high amount of fine-grained materials in these soil deposits.

Elevated Structures Over BNSFRR Tracks

Elevated structures would likely require driving piles for structural support, particularly where they would be located above areas of soft or loose soil deposits such as the modified land shown in Figure 4-3. An evaluation of the subsurface materials would be required to determine suitable depths for deep foundations for the support of the structures. Increased noise from pile-driving would be a temporary impact (see Section 4.20.2, Noise).

Ferry Pier and Landing Facilities

Offshore structures such as the ferry pier and dolphins would require driving piles for structural support. Suitable depths for deep foundations for the support of the structures would need to be evaluated. Increased noise would occur temporarily during pile-driving (see Section 4.20.2, Noise).

Multimodal Center

For all build alternatives, the proposed multimodal center would likely be located within modified land that may include soft or loose fill deposits (Figures 4-2 and 4-3). Construction of roadway alignments, parking facilities, and structures associated with the multimodal center could result in unacceptable settlements and possible damage to the structure if the soft soil conditions are not mitigated. Removal of unsuitable materials and placement of fill may be required for paved

areas and lightweight structures. Deep foundations may be required for heavier structures, such as parking structures, if soil conditions warrant or if settlements of shallow foundations are not within acceptable limits. The extent of the soft or loose deposits would need to be identified, and an evaluation of shallow and deep foundation systems and suitable depths for support of the structures would be required.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

The Point Edwards Alternative would require removing about 54,000 cubic yards of soil and placing 80,000 cubic yards of fill material (CH2M HILL, 1995). Point Edwards would require a greater amount of fill than would Mid-Waterfront.

Roadway Alignment on Hillside

Point Edwards would involve excavation and fill placement within the landslide hazard areas on the steep slopes of the hillside. Potential impacts associated with stability and erosion of the hillside would be similar to those described above for both build alternatives.

Ferry Pier and Landing Facilities

The existing underwater slope in the vicinity of the ferry pier appears to be stable, but may become unstable if the slope becomes steeper. Removal of the existing UNOCAL pier could cause movement of the near surface soils on the slope and subsequent slope instability. Construction of foundations for the offshore facilities, such as the ferry pier, fixed and floating breakwaters, and dolphins could potentially impact stability of the steep underwater slope. Substantial movement of the near surface soils on the slope may occur during pile-driving from vibration of the loose surficial soils. Such activity could create minor slides around piles, reducing the available side soil support to the pile system. Deeper piles or soil improvement techniques may be required. An evaluation of the stability of the slope will be necessary prior to design and construction of the Point Edwards pier facilities (see "Mitigation Measures").

Phase 1

The short-term construction impacts of Phase 1 will be similar in nature to full buildout. Because of the narrower ferry pier, presumably there would be fewer piles and thus slightly less likelihood of sloughing of the underwater slope.

Alternative 3: Mid-Waterfront Site

Full Buildout

Under the Mid-Waterfront Alternative, earth-moving activities and exposure of soils would be more extensive than with Point Edwards, primarily because of construction of the Dayton Street underpass. The amount of cut material would

increase over Point Edwards with about 39,000 cubic yards required. The amount of fill necessary would be substantially less than for Point Edwards with about 13,500 cubic yards required (CH2M HILL, 1995).

Roadway Alignment on Hillside

Mid-Waterfront would cross the same landslide hazard areas as for Point Edwards. Potential impacts associated with stability and erosion of the hillside would be similar to those described above for both build alternatives.

Ferry Pier and Landing Facilities

Potential stability impacts associated with underwater slopes would be less extensive than for Point Edwards because of relatively flatter slopes and more favorable geologic conditions anticipated in the Mid-Waterfront underwater slope area.

Dayton Street Underpass

With Mid-Waterfront, Dayton Street would extend beneath the existing BNSFRR tracks. Cuts up to about 22 feet deep would be required. Railroad service would be maintained during construction. Construction of the underpass would include cut-and-cover tunneling methods, and the existing railroad would be supported temporarily during construction to prevent movement of the structure. An evaluation of temporary and permanent structural support of the railroad would be required during the design phase.

The underpass would require permanent vertical retaining walls. Construction of the underpass would also require substantial temporary dewatering and permanent control of groundwater seepage where the retaining wall system and roadway would be near or below groundwater. The pressure from the groundwater could cause the structure to float. Temporary dewatering and permanent seepage control systems would be needed, as well as design of an appropriate anchoring system to prevent the structure from moving upward. The depth and horizontal extent of dewatering would depend on the final engineering design of the structure.

Dewatering could cause settlements of adjacent buildings, utilities, and roadways. Potential settlement characteristics in the vicinity of the underpass would need to be evaluated to determine the extent of such movement within soils beneath structures. Dewatering could also potentially impact the wetlands located south of the underpass (see Section 4.20.7, Wetlands).

Phase 1

Short-term construction impacts of Phase 1 would be similar to those described for full buildout. One possible concern, however, would relate to the potential effects to the ferry access roadway/vehicle holding area (proposed as part of Phase 1) as a result of the later construction of the Dayton Street underpass. As previously noted, the dewatering activities associated with the construction of the underpass could result in possible ground settlement in the immediate vicinity.

Mitigation Measures

Impacts Common to All Build Alternatives

This project will be designed so that stability of the slopes will be maintained or increased. A geotechnical investigation would be performed as part of the design phase. Specific recommendations for subgrade preparation, roadway embankments, cut and fill, foundation design, retaining structures, mechanically stabilized earth walls, dewatering measures and long-term groundwater seepage control, and erosion control would be prepared for approval by regulatory agencies before construction.

A detailed erosion and sedimentation control plan would be included as part of the contract specifications. The plan would include the following measures:

- Phase clearing and grading to minimize the amount of disturbed soil at any particular moment
- Retain existing vegetation wherever practicable
- Direct runoff from cleared areas toward areas stabilized against erosion
- Cover stockpiled soils
- Landscape exposed areas as soon as practicable
- Apply construction methods and materials to minimize erosion

Construction may be phased to limit potential temporary impacts related to dust associated with hauling materials to and from the construction area. Vegetation would be established to decrease erosion from surface runoff.

The geotechnical investigation would include a seismic evaluation of the project area. This evaluation would include an analysis of liquefaction potential of the site soils. Offshore and upland structures would be designed to meet Seismic Zone 3 Design Requirements (UBC, 1994). Potential impacts of soil liquefaction would be mitigated by compacting the relatively loose soil deposits using such methods as vibroflotation or vibrocompaction or by using stone columns or other stabilization systems. The need for such systems and design specifics would be evaluated on a case-by-case basis for the individual structural elements potentially impacted.

Roadway Alignment on Hillside

The project will be designed so that stability of the slopes is maintained or increased. This will be accomplished by conducting a geotechnical study to evaluate slope stability and to identify potential factors that might contribute to slope instability. These could include weak zones in the slope, seismic activity, jointing, high water content, groundwater seepage, or steepening. Retaining walls such as soldier pile wall systems with tiebacks could be used to support the cuts. Piles would extend below potential unstable planes within the soil to prevent wedge-type slope failure in the transitional beds. Two or more rows of soldier pile walls would

be used where deeper cuts into the slope occur. The cuts for these walls would be completed in stages to reduce the potential for sliding during construction. Mechanically stabilized earth walls could be used to support fill areas. Slopes could be flattened to 2H:1V (horizontal:vertical) or more to improve stability. Where groundwater seepage would be expected to occur in cuts into the slope, the seepage would be directed away from the cut using cutoff or interceptor drains. The design could maintain flow to the wetlands by releasing water in such a way that it would flow to the wetland.

Elevated Structures Over BNSFRR Tracks and Ferry Pier and Landing Facilities

Suitable depths for deep foundations for the support of the BNSFRR structures would be identified and evaluated during the geotechnical investigation.

Multimodal Center

The site soils would be characterized during the geotechnical investigation to identify the depth and horizontal extent of soft or loose deposits. Soft or loose soil deposits would be removed and replaced with structural fill where lightweight structures and pavements are planned, provided they can tolerate potential settlements. Potential settlements would be evaluated during the design phase. Suitable depths for deep foundations for support of heavier structures would be identified and evaluated.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Mitigation measures would be similar to those described above for all build alternatives and would also include an evaluation of the stability of the steep underwater slope. The need for soil improvement techniques or flattening the slope would also be evaluated.

Alternative 3: Mid-Waterfront Site

Mitigation measures would be similar to those described above for both build alternatives and may also include the following.

The existing BNSFRR tracks at the Dayton Street underpass would require structural support using such measures as driven or auger cast piles to prevent displacement during construction of the cut-and-cover tunnel. Dewatering would be required for this type of construction. Watertight retaining walls, such as slurry diaphragm walls or secant pipes, as well as a watertight roadway would be used to control groundwater seepage. Jet grouting would also be used to support the structure, retain excavations, and control groundwater. Interior gutter and sump systems would be used to control additional seepage. Suitable ground anchors would be used to prevent groundwater forces from lifting the tunnel structure. The geotechnical investigation would include an evaluation of potential settlements in the vicinity caused by dewatering.

Under the Phase 1 scenario, structural supports (shoring) would be used during construction of the underpass to protect the overlying roadway.

4.20.5 Waterways and Hydrological Systems

Impacts

Alternative 1: No Action

There would be no project-related hydrologic or drainage system construction impacts under the No Action Alternative.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

Construction of the Point Edwards Alternative could result in short-term sedimentation impacts on Willow Creek and Edmonds Marsh if effective controls are not used for soil erosion emanating from the existing UNOCAL property. Construction of a new ferry pier and breakwater under this alternative could have little affect on offshore hydrologic conditions in Puget Sound.

Construction activity on a total of approximately 20 acres of land from the intersection of Pine Street and SR 104 to the new ferry piers could affect Willow Creek and Edmonds Marsh through deposition of sediments carried from cleared areas by stormwater runoff or winds. A portion of the access roadway and ferry holding and exit lanes through the existing UNOCAL property would require extensive excavation into the hillside, with substantial retaining walls to contain the roadway. Construction of the new multimodal center on the existing UNOCAL property would require excavation or grading on approximately 16.5 acres. Construction work in the vicinity of existing storm drain inlets could readily result in delivery of sediments to Edmonds Marsh, Willow Creek, and Puget Sound in stormwater passing through the drainage system. Sediment deposition in Edmonds Marsh could result in locally raised bottom elevations that could alter water depths for the plant communities that have adapted to existing conditions. Sediment deposition in Willow Creek adjacent to the west edge of the UNOCAL site would be of less concern because that channel segment would be modified and improved following major earthwork activities on the site.

It is estimated that approximately 2 years would be required for construction of the roadways and other multimodal center improvements. Because much of the existing UNOCAL property slopes north and west toward Edmonds Marsh and the outlet channel of Willow Creek, it is probable that these waters would receive sediment-laden flows from the construction site. Thus, it would be imperative to maintain effective erosion and sediment control practices over the long duration of construction to prevent substantial sedimentation impacts in Willow Creek and Edmonds Marsh.

Point Edwards would also have probable sedimentation impacts from extensive construction equipment traffic on surrounding roads. Much of the material excavated for road construction must be hauled off site because the soil is unsuitable for structural backfill. Backfill materials, in turn, must be imported from off site. Small amounts of soil and sediments could be deposited inadvertently on

SR 104 during transport, as well as on other access roads near the site. Soil and sediments could also be tracked onto roads in the project area via the tires of construction vehicles and equipment. Stormwater runoff on these access roads would readily pick up and transport mud and dirt, depositing much of the material in existing storm drains. Subsequent flushing of the affected storm drains by storm flows could carry the sediments into Willow Creek or directly into Edmonds Marsh along SR 104.

Over-water construction at this site would have no discernible impact on the winds, waves, or currents. Minor seabed erosion could occur with the operation of tugboats in the area used to maneuver construction barges. The pile-supported wharf and mooring dolphins should have no more effect on the currents than does the existing UNOCAL pier, because currents would have sufficient area to flow around the piles. The floating breakwater would divert the surface currents around the inshore and offshore ends of the breakwater. The deflected current could be accelerated in the very local area around the ends, but the overall effect would not alter the general current flow pattern farther downstream.

Phase 1

Phase 1 would have somewhat fewer onshore construction impacts than the full buildout because construction of some of the parking areas and most of the multimodal center would be deferred. Because SR 104 would be realigned during Phase 1 to the full build alignment, the impacts of that portion of the project on Willow Creek and Edmonds Marsh would be the same as with full buildout. The large excavations and fills necessary to construct the roadway on the existing UNOCAL property for the project would be part of Phase 1, so potential erosion and sedimentation impacts on Edmonds Marsh and the Willow Creek outlet channel and culvert associated with this substantial earthwork would be similar to those described for full buildout. Also, because the phased approach would eventually include all elements of full buildout, the cumulative construction impacts would be greater than the full buildout because of multiple construction periods.

The short-term offshore construction impacts of Phase 1 would be the same as described for full buildout because the in-water structures would be the same. Overall, Phase 1 construction activity impacts would be similar to, but slightly less than, full buildout.

Alternative 3: Mid-Waterfront Site

Full Buildout

Construction of site improvements under the Mid-Waterfront Alternative could result in substantial impacts on constructed drainage systems in the project vicinity, but would have less substantial impacts on Edwards Marsh and Willow Creek than the Point Edwards Alternative.

It is expected that erosion and sedimentation impacts on Edmonds Marsh and Willow Creek would occur to a lesser extent under this alternative than under the Point Edwards Alternative, because less clearing and grading would occur on what

is currently the UNOCAL property. The area cleared for the access and exit roadways through the existing UNOCAL property would be approximately 4.5 acres under this alternative, or approximately 25 percent of that required for the Point Edwards Alternative. In addition, there would be no multimodal center construction located on the existing UNOCAL property under this alternative.

Although the potential for sedimentation (and associated impacts on hydrology) in Edmonds Marsh and Willow Creek would be reduced compared to Point Edwards, there is still concern for adverse impacts on these waters because of the duration of construction on the existing UNOCAL property and the extent of earthwork involved.

Of more concern at Mid-Waterfront are the potential impacts of construction on the existing storm drainage system in the vicinity of Dayton Street and the railroad crossing. Drainage facilities for portions of the proposed ferry holding and exit lanes along Admiral Way and the proposed multimodal center (which would be approximately 7.4 acres in size) would most likely connect to the existing 24-inch-diameter storm drain beneath Dayton Street that discharges to Puget Sound near the public fishing pier. Construction of project facilities would require extensive tunneling, demolition, and grading work that would probably result in sediment deposition in storm drain structures along Admiral Way, Dayton Street, and Railroad Avenue, reducing the capacity of the drainage system.

Construction of the Dayton Street underpass beneath the railroad and the new ferry access lanes would probably require that existing storm drain facilities be abandoned or rerouted. These modifications to the storm drainage system could cause temporary reductions in the conveyance capacity of the Dayton Street drainage system, but it is expected that careful engineering and construction sequencing can avoid this problem.

As with Point Edwards, there would be substantial quantities of excavation and fill materials hauled to and from the site. The existing storm drains along Dayton Street near the waterfront and, to a lesser extent, those along SR 104, could be expected to receive sediment loading from the excavation and hauling activities. The Dayton Street storm drains discharge to Puget Sound near the existing public fishing pier, and the SR 104 storm drains near the project site discharge primarily to Edmonds Marsh. Thus, most of the construction-related sediment loading would be directed to Puget Sound, but some would also affect Edmonds Marsh.

Short-term, localized groundwater impacts may also be expected during the dewatering phase of the Dayton Street underpass construction. Dewatering in the excavation area would likely be continuous and extensive. Therefore, local groundwater levels would be depressed surrounding the excavation. There could also be impacts on water levels in Edmonds Marsh, because the marsh water surface is linked to shallow groundwater. Lowering of groundwater levels could cause settlement of adjacent structures (see Section 4.20.4, Geology and Soils for more information). Groundwater conditions would quickly recover upon completion of the dewatering effort.

The extent to which local groundwater levels may be depressed in the vicinity of the underpass will be determined when a specific dewatering plan is developed for the site. At that time, decisions can be made as to how potential adverse impacts can be minimized.

Construction of the ferry pier at the Mid-Waterfront site would also require that the existing WWTP outfall pipes be abandoned and permanently relocated. The new WWTP outfall would likely be located north of the existing outfall location. Impacts from construction of the new outfall would be similar to the impacts of ferry pier construction, but on a smaller scale. These impacts include stormwater runoff from exposed trenches during on-land installation of the pipeline, and suspension of sediments during in-water placement of the outfall.

Over-water construction activity for Mid-Waterfront would affect the existing eelgrass beds through propeller scour and direct intrusion of piles into the seabed. Construction activity would have no noticeable impact on the winds, waves, or currents. Currents would have sufficient area to flow around any of the construction barges and piles.

Phase 1

Phase 1 of the Mid-Waterfront Alternative would cause substantially less short-term erosion and sediment deposition than the full buildout because the size of developed areas would be considerably smaller and the Dayton Street underpass would not be constructed until full buildout. The large construction effort associated with the underpass would have the potential to cause substantial local sedimentation impacts at a later time. In addition, potential groundwater impacts caused by dewatering in the underpass vicinity would be deferred until later. However, once the underpass is under construction, temporary lowering of groundwater levels would cause settlement of the overlying ferry access roadway constructed during Phase 1.

As with the Point Edwards Alternative phasing scenarios discussed previously, impact reductions would not be proportional to the reduction in the developed area because of the need for staging areas, access roads, and heavy equipment parking areas with any construction effort. Also, because the phased approach would eventually include all elements of full buildout, the cumulative construction impacts would be greater than the full buildout because of multiple construction periods.

The short-term offshore construction impacts would be similar to, but less than, full buildout because the over-water construction activity would be less extensive during Phase 1 than would occur under full buildout.

Mitigation Measures

For construction activities associated with each of the build alternatives, the following mitigation measures, at a minimum, would be considered.

The potential for local land subsidence associated with construction dewatering of the Dayton Street underpass for the Mid-Waterfront Alternative, and its effect on surrounding structures, would be further evaluated if this alternative is pursued (see

Section 4.20. 4, Geology and Soils for more information). If subsidence is identified in the project design phase as a concern, appropriate mitigation measures would be needed. These mitigation measures would include restricting the timing of dewatering or providing structural controls that reduce the extent of groundwater drawdown beyond the excavation area.

Dewatering discharges would be routed through a sedimentation trap or other sediment containment system before release into the Dayton Street storm drain system, in compliance with the City of Edmonds, WSDOT, and Ecology requirements. The sediment trapping facility would be designed and located in conjunction with preparation of the dewatering plan.

If the Mid-Waterfront Alternative is pursued, a detailed mitigation plan for relocating the wastewater outfall would be prepared during the project design phase. This mitigation plan would address potential impacts specific to the selected alignment of the new outfall.

The proposed project would incorporate mitigation for soil erosion impacts in the form of construction site erosion and sediment controls, based on regulatory requirements in effect at the time of construction. A comprehensive erosion and sediment control plan would be required by the City of Edmonds, WSDOT, and the Ecology. Construction work would also require an NPDES permit for stormwater discharges associated with construction activities. Ecology's NPDES permit process requires development of a stormwater pollution prevention plan based on the same types of erosion and sediment control measures as those needed to satisfy the City of Edmonds and WSDOT.

The erosion and sediment control plan and the stormwater pollution prevention plan would include details on site locations where certain BMPs are to be applied. The types of BMPs that are likely to be used would include the following:

- Install silt fencing on the perimeter of work areas, along elevation contours
- Spread mulch or other temporary groundcover in areas where soils would be exposed for a period of time
- Install sediment traps or ponds to induce settling of suspended sediments in runoff prior to discharge to storm drain systems or receiving waters
- Stage clearing and grading work to limit the extent of disturbed soil at any point in time

The discussion of mitigation for construction impacts in Section 4.20.6, Water Quality includes several additional BMPs. Although these BMPs are extremely important for protection of nearby water resources and drainage systems, they are not completely effective at controlling off-site sediment transport. Thus, eroded sediments would inevitably escape collection and reach nearby drainage systems, Willow Creek, Edmonds Marsh, and Puget Sound.

Measures that would be stressed in the erosion and sediment control plan and the stormwater pollution prevention plan to minimize quantities of off-site sediment transport include the following:

- Assign one or two individuals to maintain and enforce erosion control measures. These individuals must be trained as to how different BMPs function and in necessary maintenance and monitoring schedules.

- Mark existing storm drain inlets and catch basins on the site prior to clearing and grading work. Protect these inlets with filtration inserts or removable covers to prevent sediments from entering underground storm drain pipes that discharge directly to the marsh or Puget Sound. This measure is especially important for the storm drains near the Dayton Street underpass if Mid-Waterfront is pursued.

- Establish parking and maintenance areas for vehicles and equipment as far from Willow Creek and Edmonds Marsh as possible, and away from storm drain inlets. These areas would be covered with gravel or other material to prevent erosion of underlying soil.

- Limit construction site access roads to the absolute minimum necessary to reduce the extent of sediment tracked off site. The City of Edmonds development code states that, wherever practical, construction site access is to be limited to one route (City of Edmonds, 1995). Exit points from the site would be equipped with a tire wash over a gravel pad, for use on all vehicles exiting the site. SR 104 and other heavily used access roads would be swept regularly during periods when excavation and backfill materials are transported on and off the site to minimize sediment washoff into the roadway drainage systems.

- Minimize the removal of vegetation wherever possible, and maintain vegetated buffers along the south edge of Edmonds Marsh.

- Revegetate areas of bare soil as soon as possible.

- Cover stockpiles of soil.

- Upon completion of construction activities, inspect downstream conveyance systems and new stream channel culverts for evidence of sediment deposition, and remove accumulated materials as necessary.

The permanent stormwater pond proposed on what is currently the UNOCAL site would be used as a large sedimentation pond for effective removal of eroded sediments in site runoff. This pond area is much larger than areas typically available on construction sites and, therefore, can be expected to perform relatively well. Following construction, the pond would be converted into a permanent water quality treatment facility without much difficulty. Usage as a sedimentation pond during the construction phase would not adversely affect its potential to effectively function as a permanent water quality treatment facility, as long as accumulated sediments are removed from the pond at the end of construction work. If a

permanent pond were proposed for the Mid-Waterfront Alternative, it would be used during construction in a similar manner.

Under a phased-development approach, frequent inspection of temporary erosion and sediment control structures and existing stormwater treatment structures constructed during Phase 1 would be extremely important in limiting the quantity of sediment reaching drainage systems, and in correcting any problem areas. In addition to the mitigation measures listed for full buildout, the following mitigation measures would be taken for a phased approach:

- Problem areas identified and solutions developed during Phase 1 construction would be documented so that subsequent construction can implement the most effective techniques.

- A plan to use permanent stormwater pond facilities for temporary sediment trapping would be developed that allows part of the pond area(s) to function for continuous treatment of runoff from Phase 1 facilities, while part of the area(s) serves as a sedimentation pond for subsequent construction.

4.20.6 Water Quality

Impacts

Alternative 1: No Action

There would be no project-related water quality impacts due to construction activities under the No Action Alternative.

Impacts Common to Both Build Alternatives

Construction activities can lead to a variety of water quality problems, mostly related to erosion of soils by wind or stormwater and subsequent deposition of sediments. Soil particles eroded from construction sites can carry adsorbed pollutants such as nutrients, heavy metals, toxic organic compounds, and oils. Clearing, grading, and related disturbance of previously undisturbed land can increase soil erosion rates by as much as 1,000 times over preconstruction rates (U.S. EPA, 1992). Additionally, heavy equipment operations create the potential for spills and leaks of oil, hydraulic fluids, and other toxic materials that can threaten water quality in nearby receiving waters. Construction-related impacts are usually temporary because construction activity occurs for a brief period of time.

In addition, the proposed project has the potential for substantial localized water quality impacts in Puget Sound as a result of dredging activities, in-water construction activities, over-water demolition activities, and construction of the multimodal center facilities. Either build alternative would involve demolishing a portion of the existing ferry pier, including removing creosote-treated pilings supporting that pier. Removing those pilings would likely result in local increases in turbidity for a period of time commensurate with the substrate disturbance.

An additional water quality concern relates to the potential for discharging contaminated groundwater during construction work in the UNOCAL site area. As mentioned in Chapter 3, soil and groundwater beneath the UNOCAL property have been found to contain various fuel-related contaminants. A site clean-up is expected to have begun or have been completed by the start date of this project. However, if the clean-up is not complete, dewatering activities could draw contaminated water into the excavation, thereby allowing petroleum contaminants to be inadvertently discharged above ground to near-shore receiving water in Puget Sound.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

Construction of the Point Edwards Alternative could result in short-term water quality impacts on Willow Creek and Edmonds Marsh from soil erosion, as well as potentially important impacts on the marine shoreline during removal of the existing UNOCAL pier and construction of the proposed ferry pier.

Construction work on a total of approximately 20 acres of land from the intersection of Pine Street and SR 104 to the new ferry pier, may affect Willow Creek and Edmonds Marsh water quality through deposition of sediments and associated pollutants carried from cleared areas by stormwater runoff or winds. A portion of the access roadway through the existing UNOCAL property would require extensive excavation into the hillside with substantial retaining walls to contain the roadway. Construction of the new multimodal center on the existing UNOCAL property would require excavation or grading on approximately 16.5 acres. It is estimated that approximately 2 years would be required for construction of the roadways and other multimodal center improvements. Thus, it will be imperative to maintain effective erosion and sediment control practices over the long duration of construction to avoid substantial water quality impacts on Willow Creek and Edmonds Marsh.

Aside from impacts from eroded sediments on the site, there could also be water quality impacts resulting from soil and sediments transported to and from the site by construction equipment on surrounding roads. Much of the material that would be excavated for road construction would be hauled off site, probably via SR 104, because it is unsuitable for structural backfill material. Backfill materials must be imported from off site, probably by way of SR 104. Vehicles and equipment exiting construction areas could readily track soil onto streets surrounding the project area. Soil and sediment would likely be deposited inadvertently on SR 104, as well as on other access roads near the site. Much of SR 104 near the project site drains to Edmonds Marsh, and the marsh would be expected to receive at least minor amounts of sediments in silt-laden runoff from SR 104.

Construction of a new stream channel alignment for Willow Creek could result in minor water quality impacts if adequate BMPs were not applied to prevent erosion of the new channel. It is anticipated that construction of this new channel segment would occur in relatively dry soils, and streamflow would not be routed into the channel until it is stabilized. Therefore, the associated water quality impacts would be minor.

Replacing the UNOCAL pier with a new ferry pier could affect water quality of the marine shoreline. The intertidal and subtidal zones along the shoreline inevitably would be affected by demolition of the existing pier, including removal of creosote-treated pilings. In addition, new impacts could be caused by placement of new pilings; installation of a roadway surface; placement of wing walls, berthing aprons, and dolphins; and associated construction activities. Stormwater runoff from the ferry piers during the construction period could introduce petroleum hydrocarbons, metals, and other hazardous chemicals directly to the marine environment. These materials could also enter Puget Sound directly if a spill occurs during over-water construction work.

Removal of the existing pier and construction of new piers must occur between July 16 and February 15 due to permitting restrictions. Depending on whether the demolition and construction activity could be accomplished in a 7-month period, there might be two periods of construction activity in the shoreline area. The shoreline area affected could be flushed quickly by wind action and associated currents, reducing the adverse effects of resuspended sediments and other contaminants. The Point Edwards ferry terminal site would be more exposed to Puget Sound currents than the Mid-Waterfront site, which is protected on the south by the existing Port of Edmonds Marina.

Phase 1

Phase 1 would have somewhat fewer construction impacts than full buildout because construction of some of the parking areas and most of the multimodal center would be deferred. Because SR 104 would be aligned during Phase 1 to the full build alignment, the construction-related water quality impacts of that portion of the project on Willow Creek and Edmonds Marsh would be the same as with full buildout. The large excavations and fills necessary to construct the ferry holding lanes on the existing UNOCAL property would be part of Phase 1, so the erosion and sedimentation impacts associated with this substantial earthwork would occur under this scenario.

Impact reductions would not be proportional to the reduction in developed area because of the need for staging areas, access roads, and heavy equipment parking areas with any construction effort. Also, because the phased approach would eventually include all elements of full buildout, the cumulative construction impacts would be greater than with the full buildout because of two (or more) construction periods.

Alternative 3: Mid-Waterfront Site

Full Buildout

Construction of improvements at the Mid-Waterfront site would cause water quality impacts similar to those described for Point Edwards. The extent of impacts associated with ferry pier construction would probably be greater with this alternative because the size (length) of the ferry pier over open water would be larger than at Point Edwards. This alternative does not require a new breakwater nor demolition of the existing UNOCAL pier. However, some dredging would be

required to enable large ferries to dock, whereas the Point Edwards Alternative would not require dredging. Because this site is sheltered from wind and waves better than the Point Edwards site, it is possible that in-water construction activities could proceed faster, thereby reducing the duration of temporary in-water impacts.

The area of construction disturbance on the existing UNOCAL property would be approximately 4.5 acres under this alternative, or about 25 percent of the area proposed for Point Edwards. The new multimodal center would cover approximately 7.4 acres, mostly on land that is currently covered with impervious surfaces. Thus, compared to Point Edwards, Mid-Waterfront would require less excavation, stockpiling, and hauling of earth that would contribute to sediment-related water quality problems in Edmonds Marsh, Willow Creek, and Puget Sound. Therefore, the potential for contaminated sediments to be unearthed and transported downstream would also be reduced at Mid-Waterfront compared to Point Edwards.

Mid-Waterfront would, however, require extensive excavation for the Dayton Street underpass beneath the railroad tracks. The excavation would extend 22 feet below grade, and construction of the tunnel would probably require approximately 3 years to complete. The material from the excavation would most likely be hauled off site. The existing storm drains along Dayton Street near the waterfront, and to a lesser extent those along SR 104, could be expected to receive relatively heavy sediment loading from the excavation and hauling. Most of the construction-related sediment loading would be directed to Puget Sound, but some would also affect Edmonds Marsh. If pollutant source control BMPs are effectively implemented on the construction site, sediments deposited in Puget Sound and Edmonds Marsh would, in general, not be contaminated with construction-related pollutants. Therefore, eventual spreading and flushing of the deposited sediments would result in negligible long-term water quality impacts in these receiving waters.

A unique concern related to dewatering in the Dayton Street underpass area is the potential for discharging contaminated groundwater. As mentioned in Chapter 3, soil and groundwater beneath the Harbor Square development have been found to contain various fuel-related contaminants. If dewatering activities draw contaminated water into the underpass excavation, the petroleum contaminants could be inadvertently discharged above ground and could affect near-shore receiving water in Puget Sound.

Dewatering operations for the Dayton Street underpass could also inadvertently draw saltwater from Puget Sound towards the pumps. If saltwater intrusion does occur in shallow groundwater near the underpass, it could cause a temporary increase in the salinity of water in Edmonds Marsh. This would not be a problem because the marsh already contains saline water at various times as a result of tidal influences. Soon after the dewatering ceases, a fresh groundwater lens would be reestablished (if saltwater intrusion occurred) as a result of the subsurface flow gradient, and saltwater in the shallow groundwater near the underpass would be pushed back out to Puget Sound. It is expected that temporary saltwater intrusion would not have the potential to affect the Deer Creek Hatchery or any other freshwater users in the area.

Construction of the ferry pier at the Mid-Waterfront site would also require that the existing WWTP outfall pipelines be abandoned and permanently relocated. The likely location of the new outfall would be north of the existing outfall location. Construction of a new wastewater discharge outfall would result in another set of short-term water quality impacts specific to the chosen location. These impacts relate primarily to elevated turbidity from sediment-laden stormwater runoff from exposed trenches during on-land installation of the pipeline, and suspension of sediments during in-water placement of the outfall. These construction activities could also potentially degrade water quality along the Puget Sound shoreline by increasing nutrient loading and metals concentrations. Aside from transferring the point of impact of wastewater discharges to the near-shore aquatic environment, the extent of long-term impacts would be essentially the same as under existing conditions.

Phase 1

Phase 1 of the Mid-Waterfront Alternative would have substantially fewer short-term construction impacts on water quality than full buildout, because the Dayton Street underpass would not be constructed until full buildout. The sediment and pollutant loads that could potentially enter the Dayton Street storm drain system and Puget Sound from that large construction effort would be deferred until later. There would also be fewer short-term water quality impacts on Edmonds Marsh, Willow Creek, and Puget Sound because of the reduced areas of construction disturbance associated with new roadways and the partially completed multimodal center.

As with the Point Edwards Alternative phasing scenarios, impact reductions would not be proportional to the reduction in developed area because of the need for staging areas, access roads, and heavy equipment parking areas with any construction effort. Also, because the phased approach would eventually include all elements of full buildout, the cumulative construction impacts would be greater than with the full buildout because of multiple construction periods.

Mitigation Measures

The proposed project would incorporate mitigation in the form of construction site erosion and sediment controls, based on regulatory requirements in effect at the time of construction. A comprehensive erosion and sediment control plan is required by both the City of Edmonds and Ecology's NPDES permit process (stormwater pollution prevention plan) in slightly varying formats. These plans also must include details on prevention of pollution from sources other than soil and sediments, such as operation and maintenance of construction equipment. Due to the proximity of the build alternatives to Edmonds Marsh and Willow Creek, the plans for erosion and sediment control measures and other pollution prevention measures would be critical. Continuing maintenance of and improvements to those measures would also be extremely important.

The erosion and sediment control plan would include details on site locations where certain BMPs are to be applied. Types of BMPs likely to be used would include the following:

- Delineate the limits of construction site disturbance with highly visible fencing
- Install storm drain inlet protection devices in the site vicinity at all locations where sediments could conceivably be discharged into the existing storm drainage system.
- Install silt fencing on the perimeter of work areas, along elevation contours
- Spread mulch or other temporary groundcover in areas where soils would be exposed for a period of time
- Provide erosion-control blankets or temporary plastic covering on disturbed earthen slopes
- Install sediment ponds or traps to induce settling of suspended sediments in runoff (permanent treatment pond facilities could be constructed at the outset to provide for large settling pond storage volume)
- Stage clearing and grading work to limit the extent of disturbed soil at any point in time.

Although all of these BMPs are extremely important for protection of downstream resources, they are not completely effective at controlling off-site sediment transport.

Other erosion and sediment control measures that would mitigate potential water quality impacts are outlined in "Waterways and Hydrological Systems." In addition, the following measures would be taken to improve protection of surface-water quality:

- Stock spill clean-up materials in the designated equipment parking area(s). (Equipment fueling and washing will occur only in these designated areas. Given the extent of construction operations on the existing UNOCAL property, these measures are most important for development of Point Edwards).
- Provide designated disposal facilities (separately) for waste oil, ordinary garbage, and contaminated materials such as used engine parts.
- Use mechanical methods of clearing vegetation rather than applying herbicides.
- Recycle cleared vegetation on the site for use as mulch in areas of bare soil. If vegetation contains purple loosestrife or other invasive species, the material would be bagged and moved off site, and approved mulch material would be applied to the site.

Mitigation measures for in-water construction activities on the Puget Sound shoreline would include the following:

- Before demolition of the existing UNOCAL pier and part of the existing ferry pier, develop a plan in consultation with the representatives of Ecology and the

WDFW for appropriate BMPs to prevent water quality impacts. This plan would be site-specific and would incorporate information on the best methods of removing creosote-treated pilings based on recent research in the Puget Sound area.

- Avoid or minimize the disturbance of marine sediments during ferry dock construction under both build alternatives by using a four-point mooring construction barge that would minimize the use of tug boats, and use the same technique in wastewater outfall construction under the Mid-Waterfront Alternative.

- During new dock construction, store toxic materials such as paints, lubricants, oil, coatings, and solvents in a protected onshore location when not in use, to minimize the potential for accidental spills in the water.

- Prepare a SPCC plan, for construction work in and adjacent to the waterfront.

Dewatering plans for the Dayton Street underpass for the Mid-Waterfront Alternative and potentially the UNOCAL site for the Preferred Alternative (Point Edwards) would need to include engineering controls to prevent withdrawals of contaminated groundwater present beneath the Harbor Square development. These controls would be mechanisms to cut off the lateral flow of groundwater, such as slurry diaphragm walls, slurry trenches, secant piles, and jet grouting. Monitoring water quality in dewatering discharges would help determine whether contamination problems arise and would support decisions on necessary pollutant removal mechanisms.

Phase 1

Frequent inspection of erosion and sediment control facilities and permanent stormwater treatment systems constructed during Phase 1 would be extremely important to limit the quantity of pollutants reaching receiving waters and to ensure that stormwater treatment is continuously provided to previously constructed areas. In addition to the mitigation measures listed for full buildout, the following mitigation measures would be taken for a phased construction approach:

- Document problem areas identified and solutions developed during Phase 1 construction so that subsequent construction can implement the most effective techniques

- Develop a plan for a combination stormwater pond facility that allows part of the pond area to function as a wet pond or wetland for continuous treatment of Phase 1 facilities, while part of the area is set aside to serve as a sedimentation pond for subsequent construction

- Design stormwater management systems to ensure that adequate conveyance and treatment is provided for all Phase 1 facilities, while reserving capacity for runoff from additional areas developed as part of full buildout.

- Plan and design stormwater treatment facilities for eventual expansion rather than replacing, totally redesigning, or duplicating them for full buildout.

4.20.7 Wetlands

Impacts

Alternative 1: No Action

There would be no project-related wetlands construction impacts under the No Action Alternative.

Impacts Common to Both Build Alternatives

Construction for either build alternative would likely require 2 to 3 years for completion. Construction of roads and facilities located onshore would likely occur during the spring, summer, and fall.

Construction activities would include excavation, development of embankments and drainage systems, erection of structures, and paving. Clearing and grading during construction would expose soils and increase the potential for erosion and sedimentation in the Edmonds Marsh, which could accelerate natural sedimentation processes, reducing flood storage and water quality functions. Accidental spills of fuels, lubricants, and solvents during construction could potentially degrade water quality within the marsh, thereby adversely affecting its functions and values. An increase in pollutants typically found in roadway runoff (e.g., petroleum products, heavy metals, particulates) resulting from the higher traffic volumes in the project area could also negatively affect wetland water-quality functions, because these pollutants, which may be toxic to aquatic organisms, could accumulate in marsh plant material. In large measure, the magnitude of these wetland impacts would depend on mitigation measures and the effectiveness of stormwater control and treatment. Construction that modifies the groundwater regime in the vicinity of wetland areas could change the ability of a wetland to retain or to discharge water.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

Realignment of SR 104 at Pine Street to provide access to the ferry pier and multimodal center would require substantial fill and excavation work to install a new culvert at Willow Creek.

Figure 4-24 shows wetland impacts for the Point Edwards site. Approximately 0.06 acre of wetland would be impacted during the daylighting of Willow Creek; however, there would be a net gain of 0.57 acre in the daylighted portion of Willow Creek. As a result of the project, the length of Willow Creek confined to a culvert would be substantively reduced; consequently, there would be a net gain in wetland and stream habitat following construction.

Alternative 3: Mid-Waterfront Site

Full Buildout

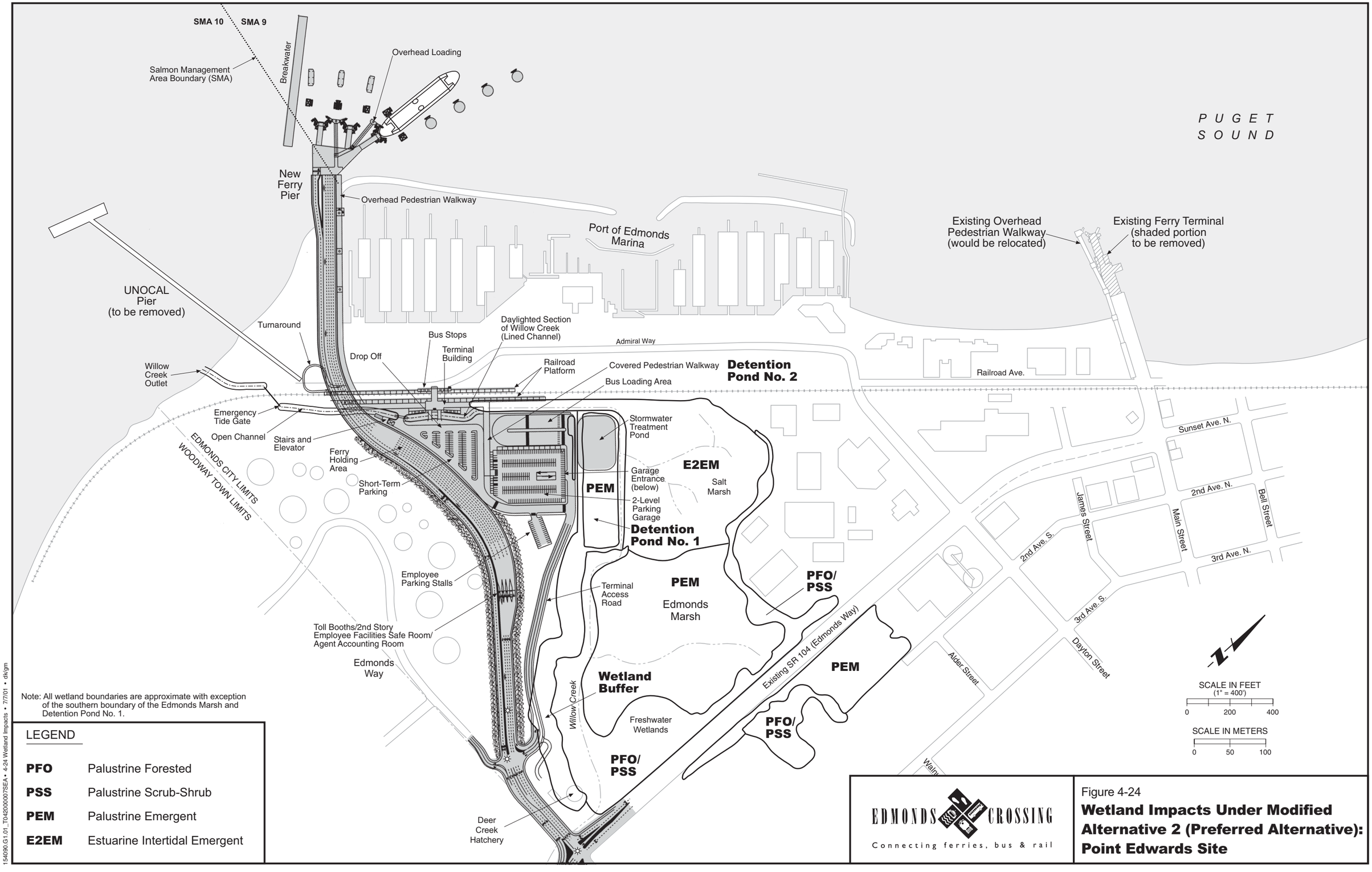
Figure 4-25 shows wetland impacts for the Mid-Waterfront site. Approximately 0.3 acre of wetland buffer would be cleared along the southern margin of the forested/shrub component of Edmonds Marsh during construction of the new roadway. Impacts on wetland buffers would be greater for this alternative because the roadway alignment would be closer to the southern boundary of Edmonds Marsh. In addition, siting of the proposed ferry access road on the west side of the BNSFRR right-of-way would require relocating the railroad maintenance spurs from the west to the east side of the main line. Construction of the maintenance spurs would result in the loss of approximately 0.36 acre of riparian vegetation along the drainage channel and associated wetland fringe on the western edge of the existing UNOCAL property. It is also possible that dewatering of the Dayton Street underpass for access to the Port of Edmonds, Marina Beach Park, and other waterfront uses could temporarily lower the water table in the northwest portion of Edmonds Marsh, because the marsh surface is linked to shallow groundwater. Groundwater levels would be expected to recover quickly when the dewatering activities were completed.

Approximately 0.36 acre of the wetland associated with the drainage channel conveying the creek west of the UNOCAL site would be impacted under this alternative. In addition, this alternative does not provide the beneficial impacts to wetlands found in Modified Alternative 2 associated with the daylighting of Willow Creek.

Mitigation Measures

Construction impacts to wetland areas are often related to construction-related changes in the quantity and quality of stormwater runoff into adjacent wetlands and riparian systems. Potential indirect impacts to wetlands from stormwater runoff during construction would be mitigated by strict adherence to the construction BMPs recommended in the *Stormwater Management Manual for the Puget Sound Basin* (1992) and the City of Edmonds *Community Development Code* (Chapter 18.30) or the *Stormwater Management Manual for Western Washington* (Ecology, 2001), or functionally equivalent requirements developed by the City of Edmonds and WSDOT. Redevelopment of the project area would require a stormwater pollution prevention plan and temporary erosion and sediment control plan, which would provide more effective sediment control than currently occurs on site (Ewbank, pers. comm., 1995), particularly for Point Edwards (see Section 4.20.6, Water Quality). Removal of non-native species from the marsh and its buffer would be implemented prior to construction.

Impact to tidal emergent wetland associated with the daylighting and relocation of Willow Creek would be mitigated by creating a new tidal emergent wetland in the new daylighted section with a net gain of 0.57 acre.



Note: All wetland boundaries are approximate with exception of the southern boundary of the Edmonds Marsh and Detention Pond No. 1.

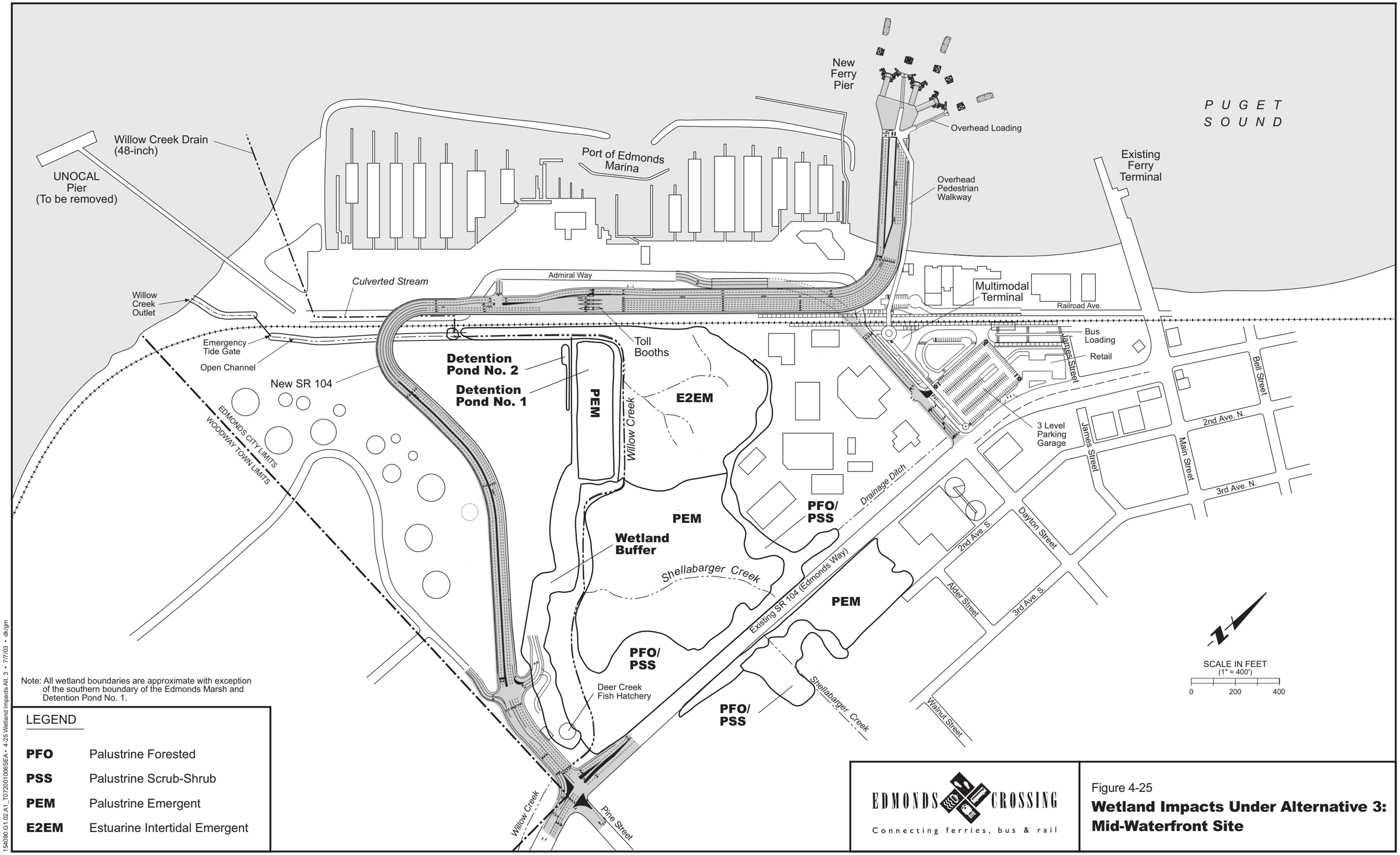
LEGEND

PFO	Palustrine Forested
PSS	Palustrine Scrub-Shrub
PEM	Palustrine Emergent
E2EM	Estuarine Intertidal Emergent

EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 4-24
Wetland Impacts Under Modified Alternative 2 (Preferred Alternative): Point Edwards Site

154090\G1.01_T042000007SEA • 4-24 Wetland Impacts • 7/7/01 • dk/gm



Note: All wetland boundaries are approximate with exception of the southern boundary of the Edmonds Marsh and Detention Pond No. 1.

LEGEND

PFO	Palustrine Forested
PSS	Palustrine Scrub-Shrub
PEM	Palustrine Emergent
E2EM	Estuarine Intertidal Emergent

EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 4-25
Wetland Impacts Under Alternative 3: Mid-Waterfront Site

154090.G1.02.A1_T072001006SEA • 4-25 Wetland Impacts Alt. 3 • 7/7/03 • dk/gm

Other mitigation measures designed to reduce impacts on wetlands would include the following:

- Flag or stake wetlands and wetland buffers before construction so that activities within these areas can be avoided
- Prohibit storage of all machinery, materials, stockpiled soils, and construction activity in wetlands/wetland buffer, and shoreline areas
- Revegetate cleared upland areas as soon as possible after final grading to minimize erosion and sedimentation impacts
- Maintain existing wetland hydrology during construction as far as practical; convey runoff from all disturbed areas to sediment ponds or interception ditches prior to introduction to wetland areas

4.20.8 Vegetation, Fish, and Wildlife

Impacts

Alternative 1: No Action

There would be no construction impacts on vegetation, or wildlife resources under the No Action Alternative. Pile-driving for normal pier maintenance would occur periodically. This would cause temporary and very minor impacts from localized turbidity.

Impacts Common to Both Build Alternatives

Pile-driving can generate high-intensity sound of sufficient magnitude to harm fish. In general, measurable harm to fish starts at exposure levels of approximately 190 dB for 1 hour (Hastings, 2002; Gisiner, 1998), with hearing being the most sensitive physiological element. Lethal conditions result from trauma to other organs and tissues in the 200 to 225 dB range and greater. Hastings (1995, 2002) recommended a management threshold for physical harm to fish at 180 dB root mean square (RMS) based on a study by Enger (1981). Enger's study showed that cod (G*adus morhua*) sustained damage to ear hair cells when continuously exposed to 180 dB (RMS) for 1 to 5 hours. Comparing the relative auditory physiology of cod to salmon, Hastings (2002) concluded that the threshold for hair cell damage in salmon would likely be around 200 dB (RMS) with continuous exposure. Hastings also recommended a "safe limit" at 150 dB (RMS) to protect the more sensitive fish species from any harm.

Avoidance responses in brown trout appear to have a threshold somewhere in the 150 to 170 dB range. The threshold for Atlantic salmon (*Salmo salar*) avoidance response using acoustic deterrent devices designed specifically for repelling salmonids was found to fall into the range of 108 to 138 dB (Turnpenny *et al*., 1993).

With a behavioral avoidance response in salmonids (brown trout) somewhere between 150 and 170 dB and potential physical harm starting at 180 to 190 dB, the gap in the sound levels between driving salmonids away and causing them harm is small. The gap is about the same for rockfish. Pile-driving can be expected to generate sound levels of 180 to 185 dB (RMS) at 100 feet (Illingworth and Rodkin, 2003). If the sound from pile-driving is left unattenuated, ear damage to fish could occur if they stayed within 100 feet of the construction activity for at least an hour. Pile-driving noise duration is measured in milli-seconds per hammer strike.

In general, juvenile salmonids lose their nearshore orientation and move offshore in Puget Sound by late August when in-water construction would start. However, recent studies show that at least some of these fish are still present in the nearshore area later in the year and potentially year-round. As a result, in-water work during the approved fish work windows would not completely exclude salmonids from the area of construction activity. The likelihood that the presence of juvenile salmonids and construction activity would coincide, however, is greatly minimized by work window restrictions. Other fish species such as sea perch, rockfish, sculpins and flatfish could be expected to be present throughout the in-water construction period.

Noise levels associated with upland construction activities (up to 96 dBA at 50 feet) and pile-driving (up to 105 dBA L_{max} at 50 feet, an increase of up to 50 dBA over ambient urban noise levels) could affect wildlife using habitats in the vicinity of the construction area (U.S. EPA, 1972). Effects of noise upon wildlife appear to be localized (Spencer and Pendlan, pers. comms., 1992). Animals may be displaced and relocate, or acclimate to the disturbance. In general, animals may be able to adjust to noise if it is constant, but be displaced if it occurs sporadically (Svenson, pers. comm., 1992). Birds may not be able to hear others singing, which may disrupt their territorial and breeding behavior (Flotlin, pers. comm., 1992). Wildlife species differ in their ability to tolerate noise; tolerance depends on a variety of factors including season, type of noise (sporadic or continuous), distance from the source of the noise, and frequency of occurrence (Adolfson Associates, 1993). Many of the species present in the project area have become accustomed to occasionally high noise levels (e.g., rail, vehicle, and ferry traffic), in addition of noise generated from clean-up activities that began in July 2001 and will continue through 2004.

Increases in noise, light, and traffic could affect wildlife, although quantifying those impacts is not possible. It is likely that many species would avoid the construction site and vicinity during work hours (for example, the great blue heron and coyote). These same wildlife species, however, are likely to use the construction site and its immediate vicinity during nonwork periods. Other species, such as the meadow vole and river otter, would likely avoid the site for the duration of construction.

Relocating and widening SR 104 from Pine Street, over Willow Creek, and northwest into the UNOCAL site would result in impacts to the habitat corridor that parallels Willow Creek and connects upland habitats with the Edmonds Marsh (use of the corridor by wildlife during construction, however, is likely to be minimal and limited to nonworking hours). However, the project includes passage for wildlife through the oversized culvert beneath SR 104.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

Vegetation. Impacts to vegetation associated with construction would be primarily related to vegetation removal. The amount of impact associated with loss of vegetation would be tied to loss of specific habitat types and their use by wildlife. Loss of urban habitat would not greatly affect either vegetation or wildlife, while loss of 0.2 acre of upland forest in the vicinity of the existing UNOCAL access may impact wildlife use of this habitat (see "Wildlife," below).

Fisheries—marine environment. Temporary turbidity would be caused by suspended sediments during pile removals at the existing UNOCAL pier, the existing ferry terminal pier, and pile-driving activities at the proposed new pier. Turbidity impacts would be relatively minor and would last only a matter of hours or a few days after pile-driving activity ceases, as tidal exchange quickly disperses turbid water. The veneer of silt deposition in adjacent areas near these types of activity is typically very thin–perhaps 1/4 inch or less. Studies in Puget Sound have shown that benthic invertebrates and fish are unaffected by rapid sediment deposition of less than a few inches (Hirsch *et al*., 1978). Most benthic animals can burrow out of such shallow sediment deposits (Mauner *et al*., 1978). The area directly under the new ferry pier would be directly disturbed by pile-driving and by suspended sediments resulting from pile-driving. The area of direct disturbance would be approximately the same as the surface area of the new pier. Bottom materials may be mixed somewhat under the pier and may shift in composition temporarily to mixed substrate, then settle back to sand if the existing underlying substrate includes coarse materials. Some infaunal organisms such as clams and worms would perish from the direct impact of pile-driving within the footprint of the piles themselves.

The wood pilings of the UNOCAL piers and Main Street ferry are heavily encrusted with barnacles and mussels. Barnacle/mussel clusters, which can be 8 inches thick, form a substrate supporting a rich community of organisms (in addition to barnacles and mussels) including amphipods, various worms, and crustaceans, and ultimately support larger shrimp, crabs, and fish living in association with the piles. This community would be removed when the UNOCAL and Main Street ferry terminal piers are removed. A comparable community would become established on the piles of the new ferry pier within 1 year with full recovery within a period of 5 to 6 years.

Construction impacts to juvenile salmon would be negligible because of in-water construction timing. The new NOAA Fisheries/USFWS-approved marine in-water construction window for the protection of chinook salmon and bull trout extends from July 16 through February 15. In-water construction for this project would occur within this period. A small number of juvenile chinook salmon may be present in the vicinity before and after this construction exclusion window. Impacts to these fish are unlikely to be any more than minimal, however. Juvenile salmon are known to avoid pile-driving, associated turbidity, and other in-water construction activities (Feist *et al*., 1992). They are presumably driven offshore. The impact of this temporary (perhaps 1 to 12 hours) diversion offshore, with the associated increase in vulnerability, is unstudied and unknown. The in-water

construction window, however, is viewed by NOAA Fisheries and USFWS as adequate protection.

Water quality impacts from spills of toxic materials during construction could be possible but would unlikely be of sufficient magnitude to raise concern, as long as an approved Spill Control Plan is effectively implemented. A stormwater site plan, and spill control plan would be written before construction began and approved by regulatory agencies. These plans would provide an adequate level of protection from accidental spills of oil, gasoline, hydraulic fluid, and similar materials. A small amount of these materials could end up in marine waters around the pier as a result of stormwater discharge despite containment/treatment measures. The amount, however, would likely be so small as to be inconsequential.

Upland construction activities could temporarily increase the suspended sediment load of Willow Creek. The proposed lower creek channel would discharge into marine waters just to the south of the proposed Point Edwards pier. Any impact of increased sediment loading by Willow Creek on the adjacent nearshore marine environment is likely to be negligible, because Willow Creek is so small and most of the sediment loading would occur in winter months when rainfall is the greatest. The macroalgaes, which would otherwise sustain the greatest effect from sedimentation of flora and fauna groups, would be dormant.

Fisheries—freshwater environment. Short-term construction-related impacts to Willow Creek would be primarily water-quality related (see Section 4.20.6, Water Quality). Stormwater runoff from construction areas would be contained and managed according to the temporary erosion sedimentation control plan approved by Ecology and WDFW, which should provide an adequate measure of protection. However, because construction would span up to 3 years, there would be a risk of a breach of containment. Sedimentation would be the primary risk; temporary elevated sediment loading would likely result from construction due to the amount of upland earthwork involved and in-channel rehabilitation in the lower reach. However, most of the earthwork is downstream of the areas of good habitat (around the Deer Creek Fish Hatchery). The only construction activity upstream of the Deer Creek Fish Hatchery would be the road widening and culvert replacement at Pine Street. Because of the proximity of the water supply intake of the Deer Creek Fish Hatchery, a temporary collection and conveyance system may be required during construction to maintain a constant flow of water, free of sediment, to the hatchery. The solution to this problem is relatively simple and does not constitute an impact to the hatchery water supply. The areas of the creek having the most risk of sediment-related impacts are adjacent to the existing UNOCAL detention pond and downstream. This reach, under the present plan, would be rehabilitated with large woody debris, boulder placements and riparian zone plantings. This reach is currently very poor habitat quality for salmonids and other fish species. The bottom materials in this reach are already 100 percent silt and sand, which are relatively unproductive in stream systems.

Temporary sediment-related impacts would also occur in the lower reach of Willow Creek due to relocation of the channel. There would be a period of time, perhaps 12 months, when the new embankments would be stabilizing with vegetation and, this, susceptible to erosion. However, this reach would be isolated from the active

channel during this time with a sheet-pile wall to be removed at the end of a stabilization. Some sediment input may occur during this time immediately following connection. Since virtually no salmonid rearing occurs in this reach, impact should be minimal. Some oils, grease, and related materials could enter Willow Creek at elevated loading rates during increased runoff if BMPs were ineffective or extraordinary circumstances arise. Impacts from this source to fisheries resources are likely to be minimal.

Wildlife. Impacts to wildlife associated with noise and human activity would include displacement of wildlife and disruption of territorial and/or breeding behavior. There would be a permanent loss of 3.56 acres of upland forest habitat (this area is already disturbed by the ongoing clean-up activities at the UNOCAL site). Any individuals displaced from this habitat would move to an alternative habitat southeast and southwest of the site when possible (e.g., birds and larger mammals could move to other available forest habitat, although amphibians, reptiles, and small mammals likely would perish). The alternative habitat, however, is currently populated with other competitive individuals, and it is likely that some displaced wildlife would not find suitable unoccupied habitat niches. As a result, population levels would decrease slightly overall.

Construction activity associated with the realignment of SR 104 would occur within the WDFW recommended buffer from the great blue heron nest and roost trees. Several of these trees are located within 125 feet of the proposed access road to the Multimodal Center (see Figure 3-10). Some disturbance of the herons is probable; however, the degree of impact is difficult to assess and is likely to affect roosting herons and nesting herons differently.

The herons roosting at Edmonds Marsh may temporarily be displaced by construction activity to alternate roosts or may establish new roosts nearby, possibly along the UNOCAL bluff. Following completion of construction, it is likely that they would return to old roosts or establish new roosts in wooded area east of the proposed access road to the Multimodal Center. It is unlikely that they would leave the area because of the value of Edmonds Marsh as a foraging location, although the pattern of usage may change, and some decrease in usage is possible. Roosting herons would probably become accustomed to the realigned SR 104 as long as suitable roost trees and cover are available to them. The upland forest habitat that would be removed in the vicinity of the fish hatchery is estimated to be approximately 0.2 acre. This is a small percentage of the total roosting habitat available to herons in the area. In the event they are displaced from current roosting trees, it is likely that they may be able to relocate to other suitable trees in the area.

Nesting great blue herons, on the other hand, are known to be less tolerant of human disturbance, and the herons would likely not return to the hillside and marsh-side nesting locations during construction. However, with the mitigation measures proposed as part of this project, the herons may return following construction, and the nesting population at the marsh-side location may re-establish and actually grow over time, as the buffer between this site and the north access road would increase due to the project, and habitat would improve with the establishment of trees in an area currently vegetated with non-native shrubs.

There are examples of heron rookeries (nest sites) directly adjacent to major noise sources (Jones and Stokes, 1991; Murphy, 1988; WDFW, 1991). For instance, there is a great blue heron rookery in Seattle directly adjacent to the BNSFRR main line (Murphy, 1988). These herons appear to have become accustomed to substantial noise and rail activity.

Other birds, small mammals, and amphibians using the wetland could be disturbed by construction activities. The degree of impact depends on a variety of factors including species, season, nature of construction activity, noise level and frequency, and amount of buffer (noise and visual) left in place. Over the long term, the degree of disturbance would depend largely on the amount of buffer between SR 104 and Edmonds Marsh.

Construction of the ferry pier and multimodal center could temporarily disturb bald eagles, great blue herons, shorebirds, and seabirds. Most of the species that use the area at the present time are accustomed to a wide range of human activity including rail traffic, automobile and truck traffic, pleasure boats, and park users. While some temporary displacement of existing wildlife could occur in this area, impacts would not be expected to be consequential. Over the long term, displaced wildlife would be expected to return to similar levels of shoreline utilization. The only exception would be birds such as gulls and cormorants that use the now seldom-used UNOCAL pier. Removal of the existing pier and construction of the new ferry pier would reduce use of offshore facilities by these birds.

Threatened and Endangered Species. Potential impacts to bald eagles generated by construction would be related to increased noise and human activity. Eagles have been found to be sensitive to both noise and human activity within specific distances of their nests (Stalmaster, 1987; Watson, 1993, 1994). For example, Watson (WDW 1993) found that pedestrian activity within 658 feet reduced incubation time of nestling bald eagles considerably. A 1994 WDFW study found that nesting eagles flushed at distances greater than 274 feet.

The nearest known eagle nests are located in Woodway and north Edmonds. Distances to these nests far exceed recommended buffer zones. Consequently, no impacts on bald eagle nesting activity would be anticipated.

Less is known, however, about eagle tolerance of human activity near feeding or perching sites. Stalmaster and Newman (1978) found that 50 percent of bald eagles observed flushed from perches at 500 feet, but that 98 percent of eagles would tolerate human presence at 1,000 feet (WDFW, 1991).

The nearest known perching areas to the project are along the bluff south of the UNOCAL property, approximately 500 feet from the existing UNOCAL pier. It is possible that construction of the Modified Alternative 2 ferry pier would disrupt perching along the south bluff area. At the same time, eagles in this area have become accommodated to frequent railroad traffic and human activities at Marina Beach Park. While some minor disruption of perching behavior could occur, substantial impacts would not be likely to occur.

Bald eagles are primarily fish eaters, although they would feed on carrion, mammals, and waterfowl (Mathews, 1988; Stokes and Stokes, 1989). Eagles hunt from perches or while soaring (Ehrlich *et al*., 1988). Bald eagles using the project area feed primarily on salmon and other vertebrate fishes in Puget Sound. The Sound supports chinook, coho, pink, chum, and sockeye salmon and steelhead trout (WDFW, 1993). These salmonids are most plentiful during the period of September through March, as they prepare to enter rivers to spawn.

At the present time, salmon runs in Willow Creek are quite limited and the creek does not provide good foraging opportunities for eagles. In the future, however, if Willow Creek enhancement efforts continue and salmon runs develop further, the creek may prove of greater interest to local bald eagles.

Construction effects on chinook salmon and bull trout are discussed in detail in the "Direct Impacts" discussion in the BA.

Phase 1

Vegetation. Impacts to vegetation associated with phasing of the development would be limited to temporary loss of vegetated cover. Because the areas of construction that would not be paved (road shoulders, edges of parking lots, construction staging areas) would be revegetated following construction, additional impacts to vegetation associated with phasing are anticipated to be minimal.

Fisheries. The construction impacts of Phase 1 on fisheries resources would be slightly different from and less than with full buildout. Under Phase 1, the ferry terminal would be narrower than its ultimate design and, presumably, fewer piles would be used, which would mean that there would be less subtidal habitat disturbance and less turbidity. The actual difference between Phase 1 and full buildout would probably be in direct proportion to the number of piles.

The potential for sedimentation-related impacts to Willow Creek would be less during Phase 1 construction because less earth disturbance would occur near the creek.

Wildlife. Great blue herons, which use the Edmonds Marsh and nearby trees for nests and daytime roosts, would likely be temporarily displaced by the Phase 1 construction activity, as described above under full buildout.

Bald eagles, a Federal and State Threatened Species, use this area as a portion of their territory, and may temporarily avoid the area during Phase 1 construction. This impact is not believed to be consequential to bald eagles in the area.

Marbled murrelets and Steller's sea lions may temporarily avoid the area during construction of Phase 1.

Alternative 3: Mid-Waterfront Site

Full Buildout

Dewatering associated with construction of the Dayton Street underpass could cause water levels to fluctuate in the northern portion of Edmonds Marsh. During final design, detailed geotechnical analyses would determine whether this is a concern of consequence. Impacts on the hydrology of the project area are discussed in Section 4.20.5, Waterways and Hydrological Systems, and Section 4.20.6, Water Quality.

Vegetation. Impacts to vegetation along the new SR 104 in the vicinity of the existing UNOCAL access road would be the same as those described under the Point Edwards Alternative, above. The construction of ferry access facilities would cause some loss of urban habitat; however, given the disturbed nature of the site, most of the vegetation lost in this area is not native to western Washington. Dewatering for construction of the Dayton Street underpass may temporarily affect some wetland vegetation in the Edmonds Marsh.

Fisheries—marine environment. Construction impacts at this site would be the same as those described for Point Edwards, with the following exceptions: the Mid-Waterfront location would require the relocation of two sewer outfalls, and construction activities associated with relocating the two sewer outfalls would temporarily create turbidity and shallow burial of benthic organisms in the footprint of the outfalls and adjacent seafloor.

The surface area of short-term habitat disturbance would probably be slightly more at the Mid-Waterfront site than at Point Edwards because the pier would be longer and have more pier columns. Another difference would be that turbidity from construction could affect salmon-rearing operations in the net pen located next to the public fishing pier. The net pen could be moved temporarily, however, to an area at or near the opposite end of the fishing pier to minimize or preclude the impacts (see Figure 3-11).

Fisheries—freshwater environment. The only activity that this alternative would have that could affect Willow Creek would be the new culvert at Pine Street. That impact is discussed under “Impacts Common to Both Build Alternatives.”

Wildlife. Impacts to the Willow Creek riparian corridor in the vicinity of the Pine Street overcrossing would be the same as for the Point Edwards Alternative. Extension of SR 104 and ferry access facilities through the waterfront area is unlikely to affect wildlife. If dewatering for construction of the Dayton Street underpass affects Edmonds Marsh, wildlife using the marsh could also be affected. Under this alternative, Willow Creek would remain in the 1,275 foot-long culvert west of the UNOCAL site, providing no beneficial impact to wildlife.

Threatened and endangered species. Potential impacts on bald eagles would be similar to those described for Point Edwards; however, the ferry terminal construction at the Mid-Waterfront Site would be located approximately 0.6 mile

farther from the known bald eagle perch location on the UNOCAL bluff. Construction at this location is unlikely to disturb eagles perched on the bluff.

Potential construction-related impacts on chinook salmon and bull trout would be the same at the mid-waterfront location as the Point Edwards Alternative.

Phase 1

Vegetation. Impacts to vegetation would be similar to those discussed under full buildout.

Fisheries. Freshwater construction impacts on fisheries would be similar to full buildout.

Wildlife. The Phase 1 construction period could disturb waterfowl and marine mammals using the Edmonds waterfront to some degree (see discussion of noise for the Point Edwards site, possibly resulting in avoidance of the area during construction. It is likely that wildlife would return following completion of construction.

Mitigation Measures

Construction-related impacts would be avoided where possible and minimized by using the following methods:

- Minimize areas to be cleared and clearly mark clearing limits prior to commencement of construction.
- Revegetate disturbed areas with native vegetation as soon as practical following final grading.
- Plant the unforested area between the terminal access road and the Edmonds Marsh with Douglas fir trees and black cottonwoods following soil improvement and installation of a supplemental watering system. These trees would provide visual screening between the facility and the marsh-side heron nests and additional nesting sites as the trees grow to maturity.
- Construct a fence along the north edge of the terminal access road to prevent humans and pets from accessing the heron nest buffer.
- Use the best available technology for underwater sound intensity reduction during pile-driving.
- A fisheries biologist would be present at the construction site when initial pile driving is commenced for each class of piles. The fisheries biologist would monitor peak pressure changes in the water column (hydroacoustic monitoring) during pile driving. The hydroacoustic monitoring would consist of underwater sound levels monitored at 10 feet deep and 34 feet distant from the pile-driving site. If hydroacoustic monitoring of the first five piles does not indicate sound levels exceeding 150 dB at 10 feet deep and 34 feet distant from the pile, no

additional hydroacoustic monitoring would be needed as pile-driving continues. The energy to drive the first five piles would represent the maximum energy used on the subsequent piles. If 50 percent of the time or less levels exceed 150 dB but do not exceed 180 dB during the first five piles, pile-driving would continue along with continued hydro-acoustic monitoring or, at WSF's option, pile-driving may continue without hydro-acoustic monitoring if an appropriate sound attenuation minimization measure is used. If levels exceed 150 dB more than 50 percent of the time or exceed 180 dB during the first five piles, pile-driving would only continue with the use of an appropriate sound attenuation minimization measures.

- Conduct in-water work within approved work windows to minimize the number of salmonids from coming in contact with construction activities. Marine in-water work would be restricted to the period between July 16 and February 15. This is the current NOAA Fisheries/USFWS work window. The WDFW work window might be more restrictive; if so, the WDFW work window would supercede the NOAA Fisheries/USFWS work window. In-water work in Willow Creek would be restricted to the period between July 1 and September 30.

4.20.9 Land Use

Impacts

Alternative 1: No Action

There would be no project-related land use construction impacts under the No Action Alternative.

Project construction under both build alternatives would require landform grading and filling as well as demolition of existing structures and buildings (e.g., the UNOCAL pier at Point Edwards and residential as well as mixed-use buildings at Mid-Waterfront). These impacts would require grading permits, right-of-way construction permits, street use permits, sensitive areas ordinance variances, and demolition permits from the City of Edmonds.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

Temporary direct impacts from construction at Point Edwards would include noise, dust, and traffic congestion. Noise and dust impacts would occur to Woodway residences located along Makah Road and 117th Place SW, to recreationists at Marina Beach Park, and recreationists and tenants at the Port of Edmonds Marina. Access to Marina Beach Park would likely be shut down while ferry holding and egress lanes are under construction. Access to the visitor tie-up at the marina could be temporarily and intermittently closed during construction of the ferry pier and overhead pedestrian walkway. Temporary interruptions to local Woodway traffic would be minimal during rework of the Pine Street/SR 104 intersection, and

Woodway Park Road would remain a convenient alternative access route into this community. None of these impacts would cause changes to land use.

Alternative 3: Mid-Waterfront Site

Full Buildout

Temporary direct impacts from construction at Mid-Waterfront would include noise, dust, and traffic congestion. Noise and dust impacts would occur to recreation users at Olympic Beach Park, to Edmonds residents living on Railroad Avenue along the waterfront, and to Woodway residents in the southern portion of the project area. More information on these impacts is included in Section 4.20.1, Air Quality, and 4.20.2, Noise.

Substantial traffic interruptions would occur in the vicinity of the Dayton Street/ Railroad Avenue/Admiral Way intersection. Construction of the Dayton Street/ Admiral Way underpass would require building multiple temporary roads to provide access between downtown Edmonds and the Port. In addition, a temporary railroad bridge would also be required at Dayton Street to allow continuation of rail traffic during project construction. Temporary interruptions to local Woodway traffic would be minimal during rework of the Pine Street/SR 104 intersection, and Woodway Park Road would remain a convenient alternative access route into this community. None of these impacts will cause changes or impacts on land use.

Mitigation Measures

Section 4.20.1, Air Quality, and Section 4.20.2, Noise, discuss BMPs to help reduce temporary noise and dust emission impacts. People and businesses displaced by land acquisition would be entitled to relocation assistance and payment programs. A discussion of these programs is provided in Section 4.11, Relocation.

Permits and approvals would be acquired to ensure that the project is consistent with local comprehensive plans, zoning ordinances, and other applicable regulations.

4.20.10 Relocation

Impacts

Alternative 1: No Action

No project-related construction impacts would occur under this alternative.

Impacts Common to Both Build Alternatives

Although construction of either alternative would necessitate removal of buildings, relocation impacts are, by their nature, long term and are discussed in Section 4.11, Relocation.

Mitigation Measures

No mitigation is proposed.

4.20.11 Social

Impacts

Alternative 1: No Action

There would be no project-related social construction impacts under the No Action Alternative.

Impacts Common to Both Build Alternatives

Construction-related impacts of the build alternatives would include additional traffic on local streets, increased dust and exhaust from construction vehicles, and increased noise levels in the vicinity of construction sites.

Depending on the selected build alternative, the project is expected to generate from approximately 1,200 to 1,250 short-term (i.e., construction-related) jobs over a period of 2 to 3 years. However, because of the temporary duration of construction activities, it is not anticipated that future workers would permanently move into or near the project area; most of this labor force would probably live within commuting distances in surrounding communities within the greater Seattle-Everett metropolitan area. Therefore, temporary construction jobs are not expected to cause direct growth in the Edmonds community.

Because Dayton Avenue would terminate in a cul-de-sac immediately east of the BNSFRR tracks, and because of the at-grade ferry access road immediately west of the BNSFRR tracks, pedestrian and bicycle access to waterfront uses along Admiral Way would be circuitous and inconvenient. As with vehicles, bicyclists could access the area via the westbound ferry access roadway HOV/bypass lane. As previously discussed in the analysis of full development impacts, an at-grade or elevated crossing of the ferry staging lanes will be considered during final design to facilitate pedestrian and bicycle movement in this area.

Recreation

Construction of either of the project build alternatives would cause temporary increases in noise and dust at certain park properties, as well as creating the potential for access restrictions through road closures or construction staging operations. In order to construct the proposed ferry pier at the Point Edwards site, some construction activity would occur within Marina Beach Park. It is anticipated that all construction activities would occur within approximately 25 feet of the footprint of the pier structure. That would result in a strip of land roughly 75 feet wide (footprint and construction area) along the northern edge of the park.

A similar use of Olympic Beach Park would likely occur under the Mid-Waterfront Alternative. Construction of the ferry pier through the center of the park would

necessitate construction-related activity to occur in the remaining areas of the park immediately to the north and south.

Pile driving would likely cause many fish to leave the vicinity of the construction area of either build alternative due to noise and turbidity. This could have a noteworthy impact on recreational fishing at the Edmonds Fishing Pier during construction of the Mid-Waterfront Alternative. Construction would impact portions of the artificial reef offshore of the fishing pier, which is intended to enhance recreational fishing opportunities from the pier. In addition, the coho salmon net-pen at the north end of the fishing pier would likely be impacted during construction.

Utilities

Water. For the Point Edwards Alternative, the proposed ferry holding lanes would parallel the City's Pine Street water main and would cross the water line located in the western half of the existing UNOCAL property. Relocation of these water mains could be required in crossing areas and in areas where these lines lie within excavated portions of the new right-of-way. Tie-ins to existing water mains at the Point Edwards site would be required to provide adequate water service to the multimodal center; however, it is anticipated that existing facilities would have adequate capacity to accommodate the proposed project's water demands.

Construction of the Mid-Waterfront ferry holding lanes would cross or parallel water mains that extend along Pine Street, Dayton Street, and Admiral Way. Construction of the Dayton Street/Admiral Way underpass could also disrupt water lines in this area. Relocation of water lines could be required in crossing areas or in areas where they lie within excavated portions of the right-of-way. Tie-ins to existing water mains at the Mid-Waterfront site would be required to provide adequate water service to the multimodal center; however, it is anticipated that existing facilities would have adequate capacity to accommodate the proposed project's water demands.

Sewer. The proposed project, under both build alternatives, would parallel the Pine Street sewer force main that conveys discharge from the Woodway Park Estates lift station. Relocation of this line would be required in areas where it lies within excavated portions of the right-of-way. Tie-ins to existing sewer mains at Point Edwards would be required in order to provide adequate sewer service to the multimodal center under this alternative.

Construction of the Mid-Waterfront ferry holding and egress lanes would cross and parallel sewer lines located along Dayton Street, as well as parallel the City's two sewer outfalls. Construction of the Dayton Street/Admiral Way underpass could also disrupt sewer lines in this area. Relocation of these lines could be required in crossing areas and in areas where they lie within excavated portions of the right-of-way. The City's two sewer outfalls would also need to be rerouted as a result of this project. Tie-ins to existing sewer mains in the waterfront area would be required to provide adequate sewer service to the multimodal center under this alternative. Relocation of the two sewer outfalls would cause impacts to marine biological

resources due to excavation and fill activities (see Section 4.20.8, Vegetation, Fish, and Wildlife for details).

Storm drains. The proposed project, under both build alternatives, would parallel and cross the storm drain line that extends along Pine Street and Unoco Road. Relocation of the Pine Street/Unoco Road line would be required where it lies within excavated portions of the right-of-way.

Construction of portions of the Mid-Waterfront ferry holding and egress lanes would also parallel and cross the Edmonds Way trunk storm drain, the pipe that drains Edmonds Marsh, and the City storm drain along Dayton Street. Construction of the Dayton Street/Admiral Way underpass would also disrupt the Dayton Street storm line. Relocation of these lines would be required where they lie within excavated portions of the right-of-way. The City's stormwater outfall north of the Port's breakwater would also need to be rerouted as a result of this project.

Electric. Under both build alternatives, the project would cross and parallel two separate underground electrical facilities located on Pine Street immediately west of SR 104. It is likely that final design of this portion of the ferry and terminal access road would also require the relocation of some above-ground transmission lines located on the south side of Pine Street. Additional underground electrical transmission facilities located along Dayton Street and parallel to Admiral Way may also require relocation at the Mid-Waterfront site. Connections to the existing electrical transmission and distribution system would also be required to provide electricity to the multimodal center.

Natural gas. The Point Edwards Alternative would not cross or parallel any natural gas trunk lines. Construction of Mid-Waterfront ferry holding lanes could cross and parallel the Dayton Street trunk line. Construction of the proposed underpass could also disrupt gas mains in Dayton Street and Admiral Way. Relocation of these lines would be required where they lie within excavated portions of the right-of-way. Tie-ins to the existing natural gas transmission and distribution system would also be required to provide gas to the multimodal center.

Other utilities. Both build alternatives would parallel underground television and telephone cables located along Pine Street as well as a portion of an aerial telephone cable.

In addition to the Pine Street cables, Mid-Waterfront would potentially disturb another television cable, two marine communication cables, and subsurface telephone lines that extend along Dayton Street and cross the BNSFRR right-of-way. Relocation of these cables would be required where they lie within excavated portions of the right-of-way. Connections to the existing telecommunication system would also be required to provide telephone service to the multimodal center.

Both alternatives would require removing abandoned pipes attached to the UNOCAL pier; these pipes are not considered to be utilities but part of the UNOCAL facilities infrastructures. These facilities have been abandoned appropriately; they have been sealed closed and marked “not in service.”

Mitigation Measures

Mitigation measures for construction-related air quality and noise impacts are discussed in the applicable sections.

Recreation

All areas within Marina Beach Park or Olympic Beach Park disturbed during construction would be returned to pre-construction condition and usability. Best available technology for underwater sound intensity reduction would be used during pile driving. Pile driving would only be conducted within in-water work windows to avoid impacts to salmonids. The anticipated reef and the coho salmon net-pen located adjacent to the Edmonds Fishing Pier would be moved, if feasible, to avoid or minimize impacts to recreational fishing.

Utilities

WSDOT would coordinate with project-area water, stormwater, and sewer districts on potential relocations of mains, trunk lines, and other facilities. It is anticipated that extensive coordination efforts would be required for the Mid-Waterfront site to relocate the existing sewer and stormwater outfalls located parallel to the Port of Edmonds breakwater. Customers would be given advance notice if any interruption in service during relocations is necessary.

WSDOT would mitigate crossing of overhead and underground transmission and distribution lines affected by either of the two build alternatives as follows:

- Replace wood transmission poles, as necessary, with tall steel poles to provide adequate roadway clearance

- Coordinate with Snohomish County PUD No. 1 on the locations of new transmission poles or subsurface lines to ensure that required transmission and distribution line relocations do not result in service interruptions

Crossings of gas pipelines would meet Puget Sound Energy standards for protection of pipelines. Once a Preferred Alternative has been selected and a final design developed, WSDOT would coordinate with Puget Sound Energy regarding the placement of cul-de-sacs (e.g., Railroad Avenue) and street undercuts (e.g., Dayton Street), if necessary, and construction methods that would be least disruptive to customer service.

WSDOT would work with Verizon Communications and Comcast to advise them in advance of the need to relocate trunk and distribution lines along and within the areas of proposed right-of-way. Coordination efforts would occur sufficiently in advance of construction to minimize any disruption in telephone or cable television service in the affected area.

4.20.12 Economics

Short-Term Construction Impacts

The analysis of short-term construction impacts for each alternative includes estimates of one-time sales tax revenues, temporary construction employment and the interference of construction activity on businesses located near the project site.

One-Time Retail Sales Tax Revenue

The sales tax is levied on taxable retail sales within the City at a total rate of 8.9 percent. However, the City only receives 0.8415 percent. Table 4-26 provides a breakdown of the sales tax rate in the City of Edmonds.

Table 4-26
Sales Tax Rate

Jurisdiction	Percentage
State	6.5
City of Edmonds	0.8415
Snohomish County	0.1485
Community Transit[a]	0.9
Criminal Justice	0.1
Department of Revenue	0.01
Regional Transit Authority	0.4
Total	**8.0**

[a]State Legislature increased transit district's authority from .6 percent to .9 percent due to loss of MVET monies. (RCW 82.14.045)

Source: State of Washington, Department of Revenue, Research Division.

The value of construction labor and materials are subject to state and local sales tax. The revenue from sales tax on construction accrues to the relevant jurisdictions based on the location of the project. Each alternative would generate one-time retail sales tax revenues as a result of the application of the tax rate to the value of construction materials and labor. Table 4-27 provides the construction cost estimates for each alternative in 2003 dollars, excluding the cost of property acquisition.

Table 4-27
Estimated Construction Costs
(2003 Dollars)

Alternative	Construction Costs
Alternative 1: No Action	$0
Modified Alternative 2: Point Edwards Site	$143.0 million
Alternative 3: Mid-Waterfront Site	$135.4 million

Note: The estimated cost of purchasing property is not included in these construction costs.

These construction costs do not include right-of-way acquisition costs because the retail sales tax does not apply to the sale of real property. Similarly, certain other project-related costs may not be subject to the sales tax. For example, "soft costs" such as engineering and architectural design expenses are only taxable when they are completed as part of the construction contract. If these services are prepared separately, the retail sales tax would not apply. For the purposes of this analysis, it was assumed that 20 percent of construction costs would not be subject to the sales tax, so would not accrue to the benefit of the City. However, these construction costs would add to the general economy of King and Snohomish Counties, because local engineering and design firms would likely benefit. The one-time sales tax revenues generated by the proposed project would fluctuate during the construction period according to the level of construction activity on the site.

Temporary Employment During Construction

Potential temporary employment during the construction work was estimated for each project alternative. Estimates of construction jobs were based on a ratio of employment to construction value. According to the Washington State Input-Output Study for 1982, 17.3 construction jobs were created for every $1 million in construction activity. This ratio is expressed in 1982 dollars. Adjusting this ratio to reflect the effects of inflation since 1982 results in an estimated impact of 8.8 direct project-related jobs created for every $1 million expended in construction activity in 2003. Because the multiplier is based on a statewide model of economic activity, the estimated jobs impact is a measure of the statewide employment effect, though for a construction project, many of these temporary jobs will be located on site. A job is defined as one full-time equivalent position for one year. The construction costs provided in Table 4-27 were used as the basis for calculating temporary construction employment.

A brief discussion of potential indirect and induced economic benefits that could be generated by this new employment is included for each alternative. The indirect impacts are those generally associated with supporting activities such as materials and equipment suppliers. The induced impacts associated with construction employment would result from the project labor force spending some of their earnings on various goods and services within the economy; for example, local restaurants, grocery stores and gas stations may experience increased activity from purchases made by on-site project personnel. This new consumption could increase

local sales for existing businesses, which could create other temporary employment opportunities.

Typically, employment multipliers are used to estimate a project's indirect and induced employment impact. However, the reliability of these estimates is often questionable, and it is difficult to assign these impacts to any level of geography lower than the state. Therefore, the potential for indirect employment growth is recognized, but no estimates are calculated in this analysis.

Construction Interference

During project construction, businesses located near the project site may experience economic impacts from temporary loss of road capacity, increased traffic congestion, temporary access restrictions, and the general inconvenience and disruption caused by construction activity. All of these factors may cause certain local businesses to experience some degree of economic impact, as they make the trip to a particular business site less comfortable, which could reduce the number of trips. The impact of construction interference on businesses would vary according to such factors as the availability of competitors within a reasonable distance, the time of year, the type of business, and the proximity of the business to the right-of-way.

Possible construction interference impacts were assessed using preliminary information regarding the construction schedule and the identification of potentially affected businesses located near the construction sites. It was assumed that the construction period for the build alternatives (if built during one phase) would last 2 to 3 years.

Impacts

Construction impacts common to both build alternatives are shown in Table 4-28.

Table 4-28
Estimated Short-Term Economic Impacts

Alternative	Construction Jobs	One-Time Sales Tax Revenue	Construction Interference	Mitigation Measures
Alternative 1	0	$0	None	-
Modified Alternative 2	1,259	$993,000	None anticipated	-
Alternative 3	1,191	$919,000	Possible reduced access to some businesses and the Port of Edmonds facilities during the construction period.	Signage indicating access and business operation information. Minimize daytime street closures.

Alternative 1: No Action

There would be no project-related economic construction impacts under the No Action Alternative.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

This alternative would generate substantial short-term economic benefits for the City through one-time retail sales tax revenue and temporary employment. Negative short-term economic impacts associated with construction interference are expected to be minor given the relative isolation of the project. Construction of this alternative is estimated to cost approximately $143 million, excluding property acquisition costs. The project's construction schedule is assumed to be 2 to 3 years, if built during one phase.

Retail sales tax. The retail sales tax applies to construction material and labor. The one-time sales tax revenue accruing to the City of Edmonds from development of the Point Edwards site is estimated to be $963,000. These tax revenues would be spread over the construction period, depending on the level of construction activity, and assuming that 20 percent of construction costs would not be taxable.

Construction-related employment. Point Edwards Alternative would generate approximately 1,259 temporary construction jobs. However, it is unknown how many of these jobs would be located in Edmonds or would be filled by City residents.

Given the scale of the direct employment impacts, it is likely that there would also be indirect and induced impacts on the local economy during the 2- to 3-year construction period. The indirect and induced impacts would be a result of local/regional procurement of project supplies and equipment and the expenditure of project income on goods and services, some of which might be within the City of Edmonds. As stated previously, these impacts are acknowledged but are not estimated in this analysis.

Construction interference. Construction interference was estimated to be minimal for Point Edwards. There is a residential neighborhood to the south of the site and a wetland to the north. As a result, there is little commercial activity near the site. The only business that may be affected by construction activity is the operation of the BNSFRR. In this alternative, a bridge would be built to carry ferry traffic over the railroad tracks. Overpasses are routinely built above active railroad tracks with the cooperation of the railroads. The proposed roadway overpass is very much in the BNSFRR's interest, helping to minimize at-grade crossing conflicts at both Dayton Street and Main Street. During construction periods, railroad flaggers and operations staff would coordinate rail traffic with construction activities. Close coordination with BNSFRR and WSF would be required during construction to ensure minimized impacts on railroad operations. However, given the strategic and economic value of this section of railroad for BNSFRR, any reduced or limited use

of the railroad tracks during construction would have an important impact on the railroad.

Phase 1

During the 3-year construction period, Phase 1 would generate an estimated $574,000 in one-time sales tax revenue for the City of Edmonds (compared to $963,000 under full buildout). This tax revenue would fluctuate during the construction period, depending on the level of construction activity. Approximately 751 temporary construction jobs would be generated (compared to 1,259 jobs under full buildout). It is unknown how many of these construction jobs would be located in Edmonds or would be filled by city residents. Interference from construction activity during Phase 1 development would be similar to the interference impacts discussed under full buildout. Given the relative geographic isolation of the Point Edwards site, these impacts are anticipated to be minimal.

Alternative 3: Mid-Waterfront Site

Full Buildout

The construction of Mid-Waterfront would generate temporary economic benefits to the Edmonds economy in the form of increased sales tax revenue and temporary construction employment. However, certain businesses may experience negative economic impacts because of construction activity reducing their access and visibility. Construction of this alternative is estimated to cost approximately $135.4 million, not including property acquisition costs.

Retail sales tax. The retail sales tax applies to construction material and labor. The one-time sales tax revenue for this alternative is estimated to be $911,000. These one-time tax revenues would be spread over the time of construction.

Construction-related employment. Similar to Point Edwards, the large construction cost for the Mid-Waterfront site would result in the creation of a number of temporary construction related jobs. This alternative would create approximately 1,191 jobs during the 2- to 3-year construction period. However, it is unknown how many of these jobs would be located in Edmonds or would led by City residents.

Given the scale of the direct employment impacts, it is likely that there would also be indirect and induced impacts on the local/regional economy during the 2- to 3-year construction period. The indirect and induced impacts would be a result of local procurement of project supplies and equipment and the expenditure of project income on goods and services, some of which may be within the City of Edmonds. As stated earlier, these impacts are acknowledged, but are not estimated in this analysis.

Construction interference. Impacts to businesses during construction of the proposed project would be greatest under this alternative, because there are a number of existing businesses located near the project site. The impacts to the railroad operation would include those described in the Point Edwards Alternative,

plus a second set of construction impacts on railroad operations when the Dayton Street underpass is constructed.

The Mid-Waterfront site is located adjacent to existing commercial businesses. Therefore, during construction, the businesses may be impacted by the rerouting of traffic, reduced access, and reduced visibility. Construction activity would most likely affect businesses located on the south side of Dayton Street between SR 104 and Admiral Way and any businesses located along the west side of Railroad Avenue between Main and Dayton Streets. Access to and from the Port of Edmonds would be maintained during the construction of this alternative.

Under this alternative, an overpass would carry ferry traffic up and over the railroad tracks. During construction, train traffic would continue uninterrupted. However, given the strategic and economic value of this section of railroad for BNSFRR, any reduced or limited use of the railroad tracks would have an important impact on the railroad.

In the event of delayed or phased project development resulting from possible funding constraints, the construction-related impacts may be extended over a longer period of time. The degree of the impact of potential delays would vary depending on how the project is phased.

Phase 1

Phase 1 construction of the Mid-Waterfront Alternative would generate approximately $549,000 in one-time retail sales tax revenue and 718 temporary construction jobs (compared to $911,000 and 1,191 jobs under full buildout). Construction interference impacts during Phase 1 would be similar to those estimated for full buildout of this alternative. The Mid-Waterfront Alternative site is located near a number of existing businesses, construction interference would be greatest under this scenario and similar to that described under full buildout. These construction-related impacts could result in reductions in sales for retail businesses.

Mitigation Measures

The following mitigation measures would be used to alleviate temporary construction interference impacts:

- Maintain access to businesses throughout the construction period through careful planning of construction activities and maintenance of access during business hours. As part of construction management, prepare access mitigation measures and include them in the contract specifications for the general contractor.

- Provide appropriate signs to communicate to potential customers information such as whether a business is open or how to get to the business.

- Minimize daytime street closures.

4.20.13 Cultural Resources

Impacts

Alternative 1: No Action

There would be no cultural resource-related construction impacts under this alternative.

Impacts Common to Both Build Alternatives

Development of either the Point Edwards or Mid-Waterfront Alternative could produce short-term construction impacts to prehistoric archaeological site 45-SN-310 near the Deer Creek Fish Hatchery resulting from temporary introduction of construction crews in the immediate vicinity of the site.

Subsurface archaeological testing conducted during the preparation of this EIS suggests that the likelihood of archaeological sites being present is moderate to low, although still possible. Should such sites be present, subsurface construction that would be associated with the development of either of the build alternatives would adversely affect any historic or prehistoric archaeological sites that might be present.

Only the Suquamish Tribe has provided information to suggest that traditional cultural properties may be present in the project area. Short-term construction impacts could adversely affect any traditional cultural properties that might be present.

In general terms, if an archaeological deposit is present within a build alternative, phased development, by its very nature, would tend to defer construction of certain project elements to a future date. Because construction could disturb archaeological sites, the most likely effect of phased construction would be to subject an archaeological site to multiple episodes of disturbance.

Multiple episodes of construction tend to be more harmful to archaeological resources, because phased construction often requires demolition or modification of temporary facilities to accommodate construction or improvement to full buildout status. Additional earth movement activities associated with phased construction could result in more cumulative disturbance to archaeological sites than with a single construction event.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout. Construction impacts under full buildout at Point Edwards are discussed above, under impacts common to both build alternatives.

Phase 1. Construction impacts under Phase 1 would be the same as those for full buildout.

Alternative 3: Mid-Waterfront Site

Full Buildout. Construction impacts from full buildout at Mid-Waterfront are discussed above, under impacts common to both build alternatives.

Phase 1. In the Phase 1 scenario, little to no subsurface construction would take place in the area ultimately scheduled for construction of the multimodal terminal. Assuming that an archaeological site might be present somewhere in the Mid-Waterfront Alternative area, deferral of terminal construction to a later date would postpone disturbance of archaeological sites that might be present within the future terminal footprint.

Mitigation Measures

The proposed realignment of SR 104 under the build alternatives would not affect archaeological site 45-SN-310, and no further investigative or evaluative work is needed at this time. Although site 45-SN-310 would be unaffected by the project, any indirect effects on the site resulting from introduction of construction crews into the area would be mitigated by designating the area around the site as an "environmentally sensitive area" and restricting access to this area. Should the site become endangered as a result of project construction activities, additional archaeological investigation would be required.

Subsurface testing suggests that there is only a low to moderate chance that archaeological sites are present in the project area. No further investigative work is needed or recommended at this time. Because the subsurface testing only sampled small portions of the project area, archaeological monitoring of project construction would be carried out as a precautionary measure. The archaeological monitoring would be guided by a *Discovery Contingency Plan* that would be developed before construction. A draft *Discovery Contingency Plan* is included as Appendix D to the *Presence/Absence Testing for Archaeological Resources* (Bard and McClintock, 1996).

Demolition of the former cedar shake mills along the waterfront area and subsequent redevelopment activities in the past few decades has likely disturbed or destroyed any shallow historic features that might be present; deeper features (if present) may still lie intact. However, the presence of deeper, undisturbed historic archaeological features cannot be ruled out. Because the costs of pre-construction subsurface testing are not commensurate with the actual likelihood that important historic archaeological features are present, such testing is not recommended at this time. Nevertheless, as a precautionary measure, archaeological monitoring of construction will be carried out in accordance with a *Discovery Contingency Plan*. If historic archaeological sites are detected during construction, testing would be required to evaluate their National Register eligibility status.

Where prehistoric or historic archaeological sites cannot be avoided through project redesign, mitigation would be accomplished by implementing data recovery operations. Federal regulations provide that mitigation is only required for archaeological sites that have been determined eligible for listing in the National Register of Historic Places. Site eligibility is determined by the OAHP. A limited

program of controlled scientific archaeological excavation may be required by OAHP to develop sufficient information about a candidate archaeological site to determine its eligibility.

If previously undiscovered archaeological remains are encountered during construction activities, all work within 25 feet of the find would temporarily halt and the OAHP would be notified immediately in accordance with RCW 27.53.020 (Archaeological Resource Protection). In addition, because the project includes road construction, Section 00170.50 of the *Standard Specifications for Highway Construction* requires the contractor to cease work immediately at the site of a discovery and to avoid further damages to the resources at the site. In this case, the contractor would notify WSDOT personnel, who, in turn, would contact the FHWA and OAHP.

If any human skeletal remains are discovered during construction, all work in the affected discovery area would stop, and appropriate agencies would immediately be notified (Medical Examiner, WSDOT, FHWA, and OAHP). If the remains are suspected to be of Native American origin, appropriate authorities would include OAHP and tribal authorities (in accordance with RCW 27.44.040–Protection of Indian Graves).

4.20.14 Tribal Fishing

Impacts

Alternative 1: No Action

There would be no project-related tribal fishing impacts under the No Action Alternative.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

During the construction of the ferry terminal and other associated structures, several large vessels would be working around the perimeter of the construction zone. It is likely that two cranes on barges and at least two other barges would be used at any one time; there might be a need for more. The work window to protect juvenile salmon spans the tribal salmon fishing season, but construction sequencing could still avoid the impact of anchored construction vessels on fishing activity. During the early portion of the in-water work window, the structural elements located on the south side of the SMA 9/10 boundary line would be constructed. Construction activity and equipment would then be shifted to the north side of the terminal during the tribal salmon fisheries at Point Edwards. In this way, all construction vessels would be on the SMA 9 side of the boundary and out of the way while fishing was conducted on the SMA 10 side.

Pile-driving would be conducted during the day to avoid any conflict with gillnet fishing. The temporal separation should preclude or minimize impacts from underwater noise on fishing success.

Some turbidity would surround pile-driving activity. Adult (and juvenile) salmon would be expected to avoid the plume. The amount of suspended sediment would be minimized with the proposed use of steel pilings (the open ends create for less turbidity than solid concrete or wood pilings). The spatial extent of the turbidity plume from driving steel piles would be affected by tidal current intensity. Generally, however, the plume should be expected to extend 100 to 300 feet. As a result, the impact would likely be minimal on fishing success.

Alternative 3: Mid-Waterfront Site

Because all offshore construction at the Mid-Waterfront Site would be north of the SMA 9/10 boundary line, construction-related impacts should be negligible. The Mid-Waterfront Site is sufficiently distant from the Point Edwards tribal fishing area to ensure that impacts from pile-driving and construction vessel anchorage would be negligible.

Mitigation Measures

Other than the construction methods and timing considerations noted above (specifically related to Modified Alternative 2), no additional mitigation is considered necessary.

4.20.15 Hazardous Waste

Impacts

Before selecting a Preferred Alternative or initiating property acquisition, it is WSDOT's standard practice to conduct all reasonable inquiries to discover, investigate, and characterize hazardous substances. It is WSDOT's policy to avoid purchase of or operation on property with hazardous waste potential where possible (WSDOT, 1995). Property that is contaminated can present possible substantial environmental liability to a purchaser or operator.

When avoidance of a hazardous substance is not possible or alternatives create greater environmental impacts, early identification and evaluation of hazardous waste locations allows time for site management and environmental protection.

Potential types of hazardous substance contamination that could be encountered during project construction include the following:

- Petroleum-contaminated soil, sediment, surface water, and groundwater
- Semivolatile organic compounds (SVOCs) and VOCs and metal contaminants in soil, sediment, and groundwater
- Hazardous materials (e.g., asbestos-containing materials, LBP, PCBs) present in remaining structures, equipment, or materials scheduled for demolition or removal

- Leaks and spills from the operation and maintenance of heavy construction equipment

The location of every UST could not be verified during the site visit on June 2, 1995. Old and abandoned underground fuel tanks may remain at former residence locations and at commercial facilities in locations that were not identified in the environmental database search. Both known and unknown USTs and associated piping located within the building sites would need to be removed before construction.

During construction, an uncontrolled substance could be encountered in areas not identified during the records review and site visit. In such a case, the possible environmental impacts could include the following:

- Potential release of contaminated sediments or release of contaminants associated with treated wood pilings during in-water work. The sediment investigation conducted at the Point Edwards site (CH2M HILL, 2000c) did not identify contaminated sediments. Ecology has concurred with the findings of the sediment investigation (Turvey, 2000).

- Potential release of contaminated air emissions (dust and VOCs), soil, surface water, and groundwater during construction on land

- Potential alteration of contaminated groundwater plume(s) and generation of contaminated water during dewatering activities

- Potential alteration of contaminant migration pathways as a result of excavation or other construction activities

Project impacts could include temporary work stoppage, additional expenditures to investigate the extent of the situation, and additional expenditures to correct any potential problems, such as clean-up and disposal of old tanks, piping, and contaminated soil and water, and other potential costs associated with liability as owner or operator of the site. Workers handling hazardous waste or working on contaminated sites are required by the Washington Industrial Safety and Health Administration (WISHA) and the Occupational Safety and Health Administration (OSHA) to have appropriate health and safety training.

Electrical utilities would likely require relocation during construction. Potential impacts related to project construction include the possibility of a spill of transformer contents (i.e., PCBs) during removal and relocation.

Asbestos-containing materials are often encountered in building materials used before the late 1970s. Asbestos-containing materials would need to be handled in accordance with applicable regulations and disposed of in a landfill that is permitted to accept asbestos materials. In addition, older structures may contain LBP. Materials with LBP would need to be handled in accordance with applicable regulations. Building materials such as floors, foundations, and footings in contact with soils or groundwater containing hazardous substances may need to be tested for hazardous waste concentrations (per Dangerous Waste Regulations, WAC 173-

303) before they can be accepted for disposal at local demolition landfills. Special handling and disposal procedures will be required if the material fails to meet the specific dangerous waste regulatory criteria.

An additional potential impact common to the alternatives would be the release of a hazardous substance during construction. For example, fuels or oils needed for heavy equipment operation and maintenance could be spilled within the project area—a hazard common to all construction projects. Clean-up of the spilled material and disposal of wastes from the clean-up, including contaminated soil, can add additional time and costs to construction operations. Large spills of hazardous materials can also require assistance from emergency response agencies. The projected increased traffic would also increase the likelihood of hazardous material spills during operation of the facility.

Alternative 1: No Action

There would be no project-related hazardous waste construction impacts under the No Action Alternative.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

Table 4-29 summarizes the design or construction potential impacts for Point Edwards. Marine sediments in the vicinity of the pier have been characterized since the publication of the Draft EIS. The sediments were determined to be uncontaminated (CH2M HILL, 2000c) and a concurrence letter has been issued by the Ecology (Turvey, 2000). There is a potential for release of contaminated sediments during piling removal associated with disassembly of the transfer span at the existing ferry terminal and span reinstallation at the proposed ferry pier. The UNOCAL pier is primarily a treated-wood trestle and would require special handling to prevent release of contaminated debris to the environment. The removal of the wooden portion of the existing ferry pier also has a potential for the release of contaminated sediments and, like the UNOCAL pier, would require special handling. In addition, there is the potential for release of construction materials and hazardous materials and petroleum products, to Puget Sound during in-water work. A hazardous material survey has been performed at the UNOCAL pier to identify and estimate quantities of asbestos-containing materials, LBP, and PCBs (Argus Pacific, 2001). This information can be used to guide demolition work to minimize the possibility of release of these materials.

Cut-and-fill operations and pile-driving would be required for construction of the ferry access road (realigned SR 104). Construction work would be initiated after clean-up. However, there is a potential to encounter contamination not previously identified (i.e., not cleaned up). If such contamination is encountered, there would be a potential for: (1) releasing contaminated air emissions (dust and VOCs); (2) releasing contaminated soils or sediment to surface water; (3) releasing contaminated groundwater to soils or surface water; and (4) affecting groundwater flow direction and possible transport of contaminants during this work. Current construction method plans indicate that excavated soils would be removed from the

Table 4-29
Construction Impacts Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Site Name/Address	Property Location Relative to Project Site	Contaminated Soils	Contaminated Groundwater	Contaminated Sediments	Hazardous Materials[c]	UST/AST Removal
Washington State Ferries SR 104 & Main Street Edmonds, WA 98020	Within[a]	-	-	O	-	*
Port of Edmonds South Marina Dry Storage 400 Admiral Way Edmonds, WA 98020	Within[b]/Adjacent	•[b]	•[b]	O	O	–
Port of Edmonds 458 Admiral Way Edmonds, WA 98020	Adjacent	•	•	*	*	*
Union Oil Co. of CA 11720 Unoco Road Edmonds, WA 98020	Within[b]	•	•	–	•	–

Notes:

[a]Alternative includes removal of piling associated with dismantling of the overhead loading structure from current ferry terminal.
[b]It is assumed that currently identified contaminated soils within the project area will be remediated; long-term groundwater remediation by responsible parties, if appropriate, may be continuing.
[C]Hazardous materials include asbestos-containing materials, lead-based paint, or PCBs that may be found in buildings or other structures that may require demolition or other invasive activity during construction.

UST underground storage tank
AST aboveground storage tank
– No perceived impact
O Insufficient information; available sources reviewed do not definitively indicate the presence or absence. If contaminated media are present, a potential construction impact would be identified.
** No activity planned*
• Potential impact (Impacts may include release of contaminated media to the air, surface water, groundwater, ground soils, or impacts to groundwater flow and possible transport of containment. Refer to text for additional information.)

site because initial soil tests indicate that they would not be suitable for some backfill operations. Contaminated soils that may be encountered and excavated would need to be cleaned up and disposed of or treated in accordance with applicable regulations. In addition, if petroleum-contaminated groundwater is encountered during construction dewatering, it would need to be collected and treated or disposed of in accordance with applicable regulations. Dewatering or other construction activities may also alter contaminant migration pathways. Pile-driving might not generate soil or groundwater waste, but might transport contaminants from upper soils to deeper uncontaminated soils or groundwater. Groundwater from 300 feet below grade is used for a potable water supply within 1 mile of the proposed facility. Demolition of any remaining structures would have the potential to release asbestos-containing materials or LBP.

The location for the multimodal center is the lower yard of the existing UNOCAL facility. Construction will be initiated after clean-up of the site. However, there is a potential to encounter contamination not previously identified. If such contamination is encountered, there would be a potential for release of contaminated air (dust and VOCs), soils, surface water, and groundwater. If construction is initiated following clean-up of soils, but before clean-up of groundwater, any construction dewatering activities would require special design and handling to avoid: (1) releasing VOCs to the air; (2) releasing contaminated water to the ground or surface water; and (3) affecting groundwater flow direction

and possible transport of contaminants. Any contaminated water generated during construction would need to be collected and treated or disposed of in accordance with applicable regulations. Any drilling or pile-driving that would be required during construction could potentially carry contaminants into deeper clean soils or groundwater. Demolition of any remaining structures could potentially release asbestos-containing materials or LBP.

As mentioned previously, there would be the potential to release hazardous substances (e.g., fuel and motor oils) to the environment during construction. In addition, work in areas of contamination, if encountered, could pose a health risk to workers.

Phase 1

The potential impacts of construction related to Phase 1 would be similar in nature to those described under full buildout. The proposed multimodal center facilities would be more limited during Phase 1 and, as a result, construction impacts (such as the potential release of previously unidentified contaminated soils, groundwater, and surface water) would be less. The new facilities would be constructed in the lower yard of the existing UNOCAL property. Because much of the lower yard will be unused during Phase 1, the location of the new facilities could be adjusted to minimize disruption to possible ongoing clean-up activities on adjacent property. Construction activities would be mostly limited to above-grade structures, any subsurface excavation would not likely require dewatering or impact groundwater.

Alternative 3: Mid-Waterfront Site

Full Buildout

Table 4-30 summarizes the design or construction potential impacts for the Mid-Waterfront Site.

There is a potential for release of contaminated sediments to the water and surface sediments that could impact fish and wildlife resources during demolition of any remaining pilings from former piers, installation of new pilings for the ferry pier, and construction of a new sanitary sewer outfall for the City of Edmonds. Based on information available in Ecology's sediment database, contaminant levels in sediments in the vicinity exceed Sediment Management Standards chemical criteria. Older pier pilings are typically treated wood (e.g., treated with pentachlorophenol, creosote, or copper-chromium arsenate solutions) and may require special handling and disposal to prevent release of contaminated debris to the environment. There is also a potential for release of contaminated sediments during piling removal associated with disassembly of the transfer span at the existing ferry terminal and span reinstallation at the proposed ferry pier. In addition, there is the potential for release of construction materials and hazardous materials, such as petroleum products, to Puget Sound during in-water work.

Table 4-30
Construction Impacts for Alternative 3 (Mid-Waterfront Site)

Site Name/Address	Property Location Relative to Project Site	Contaminated Soils	Contaminated Groundwater	Contaminated Sediments	Hazardous Materials[c]	UST/AST Removal
Washington State Ferries SR 104 and Main Street Edmonds, WA 98020	Within[a]	-	-	O	-	*
Port of Edmonds 458 Admiral Way Edmonds, WA 98020	Within/adjacent	*	O	O	O	*
Port of Edmonds: Fur Breeders Building 335/336 Admiral Way Edmonds, WA 98020	Within/adjacent	•[b]	•[b]	O	O	–
Port of Edmonds: Harbor Square 120 - 190 West Dayton Street Edmonds, WA 98020	Adjacent	*	•	O	*	–
Port of Edmonds South Marina Dry Storage 400 Admiral Way Edmonds, WA 98020	Adjacent	•[b]	•[b]	O	O	–
RNC&A Marine Inc. 180 West Dayton Street, 101 Edmonds, WA 98020	Adjacent	O	O	O	*	O
Union Oil Company of California 11720 Unoco Road Edmonds, WA 98020	Within	•[b]	•[b]	O	O	–
Munson Manufacturing Inc. 150 W. Dayton Street Edmonds, WA 98020	Adjacent	*	O	O	*	*
City of Edmonds 124 Dayton Street Edmonds, WA 98020	Adjacent	–	–	–	O	–
Edmonds City Public Works, Equipment Rental 200 Dayton Street Edmonds, WA 98020	Adjacent	O	O	-	*	*
Burlington Northern Railroad 211 Railroad Avenue Edmonds, WA 98020	Within	•[b]	•[b]	–	O	•[b]
Edmonds Shopping Center 100 Block, Sunset Avenue Edmonds, WA 98020	Within	O	O	–	O	O
Various Historical Industrial Areas Along Waterfront	Within/adjacent	O	O	•	O	O

Notes:

[a]Alternative includes removal of piling associated with dismantling of the overhead loading structure from current ferry terminal.
[b]It is assumed that currently identified contaminated soils within the project area will be remediated; long-term groundwater remediation by responsible parties, if appropriate, may be continuing.
[c]Hazardous materials include asbestos-containing materials, lead-based paint, or PCBs that may be found in buildings or other structures that may require demolition or other invasive activity during construction.

UST underground storage tank
AST aboveground storage tank
– *No perceived impact*
O *Insufficient information; available sources reviewed do not definitively indicate the presence or absence. If contaminated media are present, a potential construction impact would be identified.*
* *No activity planned*
• *Potential impact (Impacts may include release of contaminated media to the air, surface water, groundwater, ground soils, or impacts to groundwater flow and possible transport of containment. Refer to text for additional information.)*

Impacts from construction of the ferry access roadway (realigned SR 104) for the portion of the roadway that crosses the existing UNOCAL property have been discussed previously. Construction of the roadway parallel to the railroad tracks may encounter petroleum-contaminated soils or groundwater detected at the Port of Edmonds South Marina area (Landau & Associates, 1998) or previously unidentified contaminated soils, surface water, or groundwater. If such contamination were encountered, there would be a potential for release of contaminated air emissions (dust and VOCs), soils, surface water, and groundwater during this work. Contaminated soils that may be encountered and excavated would need to be cleaned up and disposed of or treated in accordance with applicable regulations. In addition, previously unidentified contaminated groundwater could be encountered during construction operations, in particular during dewatering activities for construction of the Dayton Street underpass. Contaminated groundwater would be collected and treated or disposed of in accordance with applicable regulations. Pile-driving for the pier landing or underpass may not generate soil or groundwater waste, but may transport contaminants from upper soils to deeper uncontaminated soils or groundwater. Demolition of any remaining structures, in particular those that were constructed before the late 1970s, could potentially release asbestos-containing materials or LBP. Previously unidentified USTs possibly associated with the structures may need to be removed in accordance with applicable requirements.

The location for the proposed multimodal center would be north of Dayton Street in the vicinity of an older shopping center (pre-1970s), currently a state-listed contaminated site (Harbor Square), and a railroad maintenance facility. If previously unidentified contamination is encountered (i.e., not cleaned up), there would be a potential for release of contaminated air emissions (dust and VOCs), soils, surface water, and groundwater during construction. Any contaminated soils or water generated during construction would need to be collected and treated or disposed of in accordance with applicable regulations. Any drilling or pile-driving that may be required during construction would have the potential to carry contaminants into deeper clean soils or groundwater. Demolition of any remaining structures would have the potential to release asbestos-containing materials or LBP. As mentioned previously, there would be the potential to release hazardous substances (e.g., fuel and motor oils) to the environment during construction. In addition, work in areas of contamination could pose a health risk to workers.

Phase 1

The potential impacts of construction related to Phase 1 would be similar in nature to those described under full buildout. The likely impacts related to the construction of the Dayton Street underpass (dewatering and possible impacts from contaminated groundwater) would be deferred until later. Demolition of structures to accommodate the ferry access roadway and surface parking lot/temporary bus shelter and turnaround would create possible impacts from release of contaminants from asbestos-containing materials, LBP, or USTs. Construction activities would be mostly limited to above-grade structures; any subsurface excavation would not likely require dewatering or impact groundwater.

Mitigation Measures

Mitigation measures that would be taken to control project impacts are summarized below; compliance with federal, state, and local requirements is assumed:

- Identify buildings or structures to be demolished and determine whether asbestos-containing materials, LBP, or other regulated materials (e.g., PCBs) are present in structures and abate or remove prior to demolition activities. If structures that are to be demolished are found to contain these substances, follow applicable regulations pertaining to the handling and disposal of these materials. Increase conformance to federal, state, and local regulations and guidelines through regular on-site inspection.

- Conduct due diligence review of real property or right-of-way to be acquired in accordance with WSDOT or FHWA procedures.

- Identify undocumented USTs and fuel lines prior to construction. (Areas of concern include current and former residential and commercial structures as well as fuel tanks associated with former industries along the waterfront.) Permanently decommission USTs located within the project site and properly remove them before general construction activities are started.

- Identify any utilities that have to be relocated. Handle and dispose of electrical transformer oil properly in accordance with applicable regulations in order to avoid a release or accidental spill during the relocation of transformers. If transformer oils encountered have not been certified as PCB-free, testing would have to be done.

- Phase the construction activities after clean-up activities to avoid contaminated areas. Communicate with responsible parties and the regulatory agencies and coordinate schedules to lessen environmental impacts.

- Design project to avoid areas of known contamination and, if avoidance is not possible, incorporate remedial measures into the project design that are protective of human health and the environment.

- During design, coordinate with liable parties from which clean-up costs may later be recovered.

- In areas near or over where contamination may still be present (e.g., offshore sediments, groundwater in the subsurface) that cannot be avoided, implement construction techniques that minimize disturbance to the subsurface and prevent the transport of contaminants to uncontaminated areas and to surface water. Techniques will address removal of pier pilings, installation of onshore and offshore piling, dewatering activities, site grading and excavation, and stormwater pollution prevention. It is critical that construction techniques do not exacerbate site conditions.

- Address generation and disposal of contaminated sediments related to construction in construction plans. WSDOT would work jointly with all

interested agencies in accordance with the Cooperative Sediment Management Program.

- Prepare a comprehensive hazardous substance contingency and management plan and a worker health and safety plan to minimize the effects of identified and unanticipated hazardous substance impacts from contaminated soil, groundwater, and sediment. Address protection of nearby residential and business areas. If previously undiscovered contamination is encountered during construction, notify state and federal response agencies as specified in state and federal regulations, and coordinate appropriate investigation and possible clean-up.

- Prepare a SPCC plan for construction and maintenance work in or adjacent to water.

- Require the selected construction contractor(s) to follow careful construction practices to protect against hazardous material spills from routine equipment operation during construction. The contractor would maintain a current SPCC plan and would designate an individual on site as an emergency coordinator. The contractor also will be familiar with proper hazardous material storage and handling and know emergency procedures, including proper spill notification and response requirements.

4.20.16 Visual Quality

Impacts

Alternative 1: No Action

No construction activities are envisioned as part of the No Build alternative. As a result, no impacts on visual quality are anticipated.

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

Full Buildout

The quality of the visual environment in the project area would be altered during project construction by vegetation clearing and soil grading along the Point Edwards uplands, as well as by the presence of construction equipment, materials, signage, and staging areas that would reduce visual quality in the immediate area around the construction sites. Where the cleared areas and construction zones are visible, views would be degraded. The visibility of clearing and construction activities to the closest sensitive receptors (e.g., nearby recreationists, residents) would depend on the density of vegetation and other development between the viewer and the construction site.

Phase 1

During Phase 1 the major elements of the multimodal facility would not be constructed, particularly the two-story parking garage and other structures. Phase 1

multimodal improvements (parking lot, vehicle turnaround, and railroad platforms) would have a marginal effect on the visual quality of this portion of the existing UNOCAL site. These new facilities are largely a surface parking lot and roadways that replace existing pavement and a few small buildings. However, the new facilities add a more coherent development pattern in this area, and the low height of these facilities would prevent them from degrading views across the site from the Edmonds Marsh boardwalk. The visual impacts of the access and queuing lanes as they cut across the hillside would remain similar to the completed project, which decreases the visual quality of views toward the hillside.

Alternative 3: Mid-Waterfront Site

Construction impacts under this alternative would be similar to those for Point Edwards, but on a larger scale because a larger portion of the project area would be affected.

Mitigation Measures

Visual impacts during construction could be reduced by locating material and equipment storage in areas that are not prominent.

4.21 Cumulative Impacts

4.21.1 Introduction

This section addresses potential cumulative impacts on the environment that could be associated with implementation of the proposed project, in concert with other past, present, and reasonably foreseeable future actions or projects.

Cumulative impacts are defined by Council on Environmental Quality (CEQ) regulations (40 CFR §1508):

> "The cumulative impact on the environment results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR §1508.7)."

This cumulative impact analysis is focused on those environmental resource elements that would experience a measurable impact by the proposed project and, when combined with other actions in or near the project area, would result in substantive cumulative impacts. Those resource elements of concern are:

- Noise
- Drainage/water quality
- Wetlands
- Vegetation and Wildlife

- Land use
- Economics
- Visual quality

While the other resource elements addressed in this EIS would experience some level of direct project impact (as previously described), they are not of concern in the context of this cumulative impact analysis because they would not experience substantive cumulative impacts. These resource elements are:

- Air quality
- Energy
- Geology and soils
- Fish
- Relocation
- Social
- Cultural resources
- Tribal fishing
- Hazardous waste

The geographic boundaries of analysis vary and are defined by the proposed action(s) effects on the unique nature and characteristics of each environmental resource and the boundaries of other related activities that may contribute to the effects on the resource.

The cumulative impact analysis is based on consideration and identification of past, present, and reasonably foreseeable projects that could result, when addressed collectively with the proposed action, in cumulative impacts. These other projects have been identified from information provided by relevant local jurisdictions and other project proponents and/or from adopted planning and environmental review documents. Because of the relatively built-up nature of the project area, the number of other projects is rather limited, based on available information. These projects are:

Past projects:

- UNOCAL tank farm at Point Edwards (initially developed in the early 1920s).
- Port of Edmonds Marina (initially developed in the early 1960s).
- Harbor Square (developed in the early 1980s).

Present projects:

- A private developer is currently building an upscale, multi-family condominium project on the hillside above the UNOCAL lower yard.

Reasonably foreseeable projects:

- A second railroad track along the BNSFRR right-of-way. At this time, the additional track will most likely be located to the east of the existing track. The second track is necessary to accommodate the projected increase in rail traffic

over the next 20 years and to separate freight from passenger/commuter rail services that is projected to increase in the next few years.

- Related to the second track, Sound Transit has plans to relocate and redevelop the existing Amtrak station to accommodate Sounder commuter rail service.

- The *2001 Port of Edmonds Master Plan* includes a number of proposed projects such as an expanded stacked boat loft west of Admiral Way at the south end of the Port's property, an expanded south marina, more parking, an interactive fine arts center, expanded maintenance facilities between Admiral Way and the BNSFRR right-of-way, and a defined entrance area located east of Admiral Way and Railroad Avenue.

- The City of Edmonds *2001 Comprehensive Plan* and *1995 Edmonds Downtown/ Waterfront Plan* envisions future commercial, governmental, and cultural activities in the vicinity of the area to be vacated by the relocated ferry terminal, with a projected growth in employment.

4.21.2 Cumulative Impacts Associated with Each Resource

This section explains the cumulative environmental impacts that could potentially arise within implementation of the proposed project in association with the other projects that are projected to have, or are projected to have, an impact on that resource. Not all of the projects noted above will contribute to cumulative impacts on every resource analyzed below. Only those projects that have the potential to contribute cumulative impacts on that specific resource are described. Each resource discussion begins with a description of the historical and/or existing baseline so as to place the predicted impacts in context. More details related to the resources are presented in their individual discipline reports.

Noise

The project area currently experiences noise impacts due to various sources. Existing dominant noise sources include vehicular traffic on SR 104 and other local streets, occasional ferry horns, and intermittent train movements on the BNSFRR tracks. The frequency of noise impacts in the project area has grown over time coincident with development and increased human activity. Measured noise levels in the project area now range from 43 dBA to 59 dBA during daytime hours. All measured noise levels are below the FHWA noise abatement criteria for Category B land use, which includes residences, parks, schools, churches, hotels, picnic areas, recreational areas, playgrounds, and other noise-sensitive uses. Ferry and train operations generate intermittent noise levels higher than 59 dBA. The maximum noise levels associated with the operation of the ferry range from 55 dBA to 65 dBA at 100 feet. The ferry horn, sounded during arrivals and departures (56 times per day), can be heard throughout the project area. Noise levels during a train pass-by (approximately 35 per day) were measured at 87 dBA at 100 feet from the tracks. The train horn is sounded as a train approaches the two grade crossings in the project area; typical train horn noise, which can be heard throughout the project area, ranges from 95 dBA to 100 dBA at approximately 100 feet.

The cumulative impact of the projects being considered in this analysis would be increased vehicular and train traffic and business activity that would generally increase the ambient noise environment. The second railroad track and the Sound Transit commuter rail station will encourage and facilitate the projected increase in train traffic, the most dominant noise source in the project area. Train traffic is expected to increase from 35 to approximately 104 trains per day by 2030, with or without the Edmonds Crossing Project. Train noise levels combined with the predicted total project noise levels would result in substantially higher noise levels at receivers along the railroad alignment. During periods with no rail traffic, noise levels would be driven by other sources, particularly if areas of the downtown/ waterfront are further developed as envisioned by the City of Edmonds Comprehensive Plan and Downtown/Waterfront Plan. In conclusion, the consequence of the cumulative impact would be an increase in ambient noise throughout the project area and downtown Edmonds.

Drainage/Water Quality

Edmonds Marsh receives drainage from Willow Creek, Shellabarger Creek, and from immediately surrounding properties (SR 104 and the Harbor Square development). Edmonds Marsh drains southwest to the channelized extension of Willow Creek (the creek was relocated from its natural meander to this channel in the 1950s), which eventually runs through a culvert under the BNSFRR tracks. On the east side of the tracks is a tide gate that is kept open in summer and closed the remainder of the year to prevent flooding of areas adjacent to the Marsh. When the tide gate is open, the Willow Creek/Edmonds Marsh drainage system is continuously subject to tidal influences. Downstream of the railroad tracks, Willow Creek flows through a culvert that extends to the Puget Sound shoreline in Marina Beach Park. The contributing streams have been subjected to increased development over the years and water quality data reveal the results. Data for Willow Creek indicate low pH values and low dissolved oxygen concentrations that could potentially harm aquatic biota. In addition, pollutant transport into the creek could be a substantial problem, as evidenced by elevated concentrations of nutrients, suspended soils, fecal coliform, and metals. Water quality characteristics in Shellabarger Creek are assumed to be similar to Willow Creek. Drainages from these creeks and adjacent areas are contributing to the same types of pollutants found in the Marsh.

The cumulative impact of the proposed project, the hillside condominium development, and potential development to the north of Edmonds Marsh envisioned by the City's Comprehensive Plan and Downtown/Waterfront Plan (and possibly induced as an indirect impact of the project) could have some effect on peak rates and volumes of stormwater drainage to the Marsh. However, because the UNOCAL lower yard and developable areas to the north are already impervious in nature, the effects on drainage patterns may be minimal. Development from these various projects, including construction of the second track along the western edge of the Marsh, could increase erosion and sedimentation impacts on Edmonds Marsh, which could lead to partial (inadvertent) filling of localized areas of the Marsh. Because of its closer proximity to the Marsh, this impact would be more pronounced under the Point Edwards Alternative. With effective water quality facilities in place to treat site runoff (in accordance to current City stormwater

treatment requirements related to new development), however, the water quality of stormwater drainage to the Marsh should be improved compared to existing conditions. In conclusion, despite the potential for increased development in the vicinity, the consequence of the cumulative impact may actually be improved water quality in Edmonds Marsh.

Wetlands

Edmonds Marsh is surrounded by SR 104 on the east, the Harbor Square development (built in the early 1980s) to the north, the BNSFRR tracks to the west, and the UNOCAL property to the south. Historically, the Marsh was an approximately 40-acre, tidally influenced, estuarine system. Progressive filling over time as a result of the developments noted above has reduced the area of the Marsh to 23 acres. A tide gate was installed in 1962 to prevent localized flooding during storm periods. This gate, however, created a barrier to saltwater entering the Marsh; as a result, the original salt marsh vegetation changed to freshwater wetland vegetation and freshwater inflow from Willow and Shellabarger Creeks became predominant. The City of Edmonds, in an effort to reestablish the tidal influences and restore its historical salt marsh plant community, permanently opened the tide gate in 1989. Because of its size and dense emergent vegetation, the wetland provides high flood storage, sediment trapping, nutrient removal, and water quality functions. The emergent forested and shrub components provide a diversity of wildlife habitat.

As noted under Drainage/Water Quality above, the construction of the second track along the western edge of Edmonds Marsh would directly encroach on the Marsh and result in the removal of approximately 0.15 acre of emergent estuarine marsh available to wildlife. The Marsh would experience the combined pressure of the Edmonds Crossing project, the hillside condominium project, the second railroad track, and possibly other development to the north as a result of both the City's Comprehensive and Downtown/Waterfront plans and possible induced growth resulting from this project. Despite the eventual increase in activity, the City of Edmonds is committed to the protection of the Marsh. The City has planned and zoned the Marsh as "Open Space" in the City's *Comprehensive Plan and Zoning Map*. The City's *Park, Recreation, and Open Space Comprehensive Plan* designates the Marsh as a wildlife refuge. According to a Quit Claim Deed between UNOCAL and the City, the Marsh "shall be used by the City only as a public park and recreational facility with the primary purpose as a wildlife preserve and open space." In conclusion, despite increased development in the vicinity, Edmonds Marsh would continue to be protected and enhanced through the efforts of the City and the environmental community.

Vegetation and Wildlife

Edmonds Marsh provides habitat for a number of wildlife species, including birds, passerines, mammals, amphibians, and reptiles in the emergent wetland and forested/shrub wetland. The upland forest vegetation on the hillside south of the Marsh provides potential nesting and foraging habitat for a variety of birds and mammals.

As noted under the Wetlands discussion above, the second railroad track would encroach on the Marsh and result of the removal of 0.15 acre of emergent estuarine marsh available to wildlife, including foraging habitat for greater blue herons and other species. The additional track would also narrow the wildlife corridor along the railroad corridor from the Marsh to the bluffs to the south. While the Edmonds Crossing project envisions protection of much of the forested buffer immediately south of the Edmonds Marsh, the combined effect, primarily of the ferry terminal access roadway along the lower slope of the bluff and the hillside condominiums, would likely result in the removal of portions of the upland deciduous forest and upland mixed forest. Development in this area would result in a loss of available wildlife habitat and wildlife corridors and displacement of wildlife. Bald eagles could be displaced from their perching sites. The loss of adjacent forested habitat could also result in a reduction of potential roosting and perching trees for great blue heron, as well as a loss of refuge for other species. In conclusion, the consequence of the cumulative impact would be a deterioration of the natural vegetative environment in the project area and resulting effects on wildlife habitat.

Land Use

Existing land use in the project area consists of waterfront-oriented facilities, commercial businesses, and residential units. The railroad first came to Edmonds in 1895 and between then and mid-20th century, the waterfront was dominated by industrial uses (primarily shingle and saw mills) that benefited from both rail and water transport. In 1962, a small boat harbor was opened by the Port of Edmonds. It has twice since been expanded into the current marina, the dominant land use along the waterfront. A mix of commercial and residential uses stretch north along the shoreline to the existing ferry terminal at the foot of Main Street. A string of City parks also dot the shoreline, including Marina Beach Park, Olympic Beach Park, and Brackett's Landing North and South. The Harbor Square development borders Edmonds Marsh on the north, the BNSFRR tracks on the west, and SR 104 on the east. Harbor Square, built in the early 1980s, contains office and retail uses, a motel, and athletic club. North of Harbor Square and east of the railroad tracks is the old Safeway complex, a large underutilized property that is ripe for redevelopment. South of Edmonds Marsh is the former UNOCAL tank farm property. First established in the early 1920s, this facility is now closed and has undergone site cleanup; the lower yard is the proposed site (Point Edwards Alternative) for the Edmonds Crossing multi-modal center. Upscale condominiums are being built on the overlooking hillside, also part of the original UNOCAL property.

The cumulative effect of the proposed project and the other projects considered in this analysis would likely be the acceleration of land development in the project area and throughout the downtown, consistent with the vision reflected in the City's planning documents for the downtown and waterfront areas. The new development would result, in turn, in a likely general increase of activity in the project area as measured by traffic, noise, and other indicators of quality of life. Development of the proposed project and integration of the Sound Transit commuter rail station within the proposed multi-modal center at Point Edwards could result in a greater focus on the part of developers in the southern portion of downtown. Similar project development at the Mid-Waterfront site could result in more new development farther north and closer to the current downtown retail core. In conclusion, the

consequence of the cumulative impact would be a change in the character of the Edmonds downtown; the area is expected to become more intensely developed, more active, and busier than it is today.

Economics

The downtown/waterfront area is one of the City's principal commercial districts. Surveys indicate that, on average, less than 5 percent of the business activity in the downtown/waterfront area is related to the ferry terminal; only 11 percent of businesses state that the ferry is important to their operation. On the other hand, however, vehicular access to the downtown retail core is substantially interrupted during ferry loading and unloading operations.

The cumulative impact would likely be the development of more commercial activities outside the current downtown retail core. The integration of the Sound Transit commuter rail station with a relocated ferry terminal would likely create a substantial demand for new business amenities and services in close proximity to these high-use facilities. The concentration of the new terminal at the Point Edwards site, expanded facilities within the Port of Edmonds Marina, and residential development on the hillside could result in a southwestern shift of the retail core and create additional pressure to develop the old Safeway site and to expand the Harbor Square property. In conclusion, the consequence of the cumulative impact would be an intensification of commercial/retail activity throughout the downtown area and a possible shift in the location of the retail core of the City because of the new development and activity in the project area and vicinity.

Visual Quality

As development has occurred, the visual character of the project area has changed. The project area currently contains a number of unique landscape districts and specific sensitive viewers. Landscape districts within the project area include the flat lower yard and the hillside of the upper yard of the UNOCAL property (the hillside is visible throughout the project area); Edmonds Marsh (the largest parcel of natural, undeveloped open space in the project area); Marina Beach Park; the Port of Edmonds Marina; and the downtown retail core. The two most sensitive viewers groups are recreationalists and local residents; both have demonstrated high sensitivity to changes in the existing natural setting.

The cumulative effect of the projects considered in this analysis would likely be an incremental decrease in the quality of scenic vistas and public views. Development of the condominiums on the hillside would be the most apparent visual change (although some viewers may consider residential development preferable to the UNOCAL storage tanks that were in place until 2001). The combination of the multimodal center at the Point Edwards site and the condominiums would result in the removal of considerable vegetation (at least for construction) and make the area south of the Marsh more visible to most viewers from the northeast or west (shoppers in the downtown, residents to the north and east, ferry riders, recreationalists along the waterfront, and visitors at Edmonds Marsh). In addition, with the possible increased pressure for development to the north of the Marsh (Harbor Square and the old Safeway property), Edmonds Marsh is likely to become

more isolated visually from its surroundings. In conclusion, the consequence of the cumulative impact would be a change in the visual environment of the project area and vicinity; the area would transition from undeveloped/developed parcels and green areas to a more developed urban appearance.

4.22 Indirect Impacts

4.22.1 Introduction

This section addresses potential indirect impacts on the environment that could be associated with implementation of the proposed project. Indirect impacts are caused by a proposed action, but are later in time (although reasonably foreseeable) or farther removed geographically. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural resources.

Indirect impacts are linked to a discernable direct impact due to the project. Those environmental resource elements that would experience a measurable direct impact and that are likely to experience substantive indirect impacts as well are:

- Land use
- Traffic
- Noise
- Wetlands/wildlife
- Drainage/water quality
- Social (recreation)
- Economics
- Visual quality

The other resource elements addressed in this EIS would not likely experience substantive indirect impacts; those resource elements are:

- Air quality
- Energy
- Geology and soils
- Fish
- Relocation
- Cultural resources
- Tribal fishing
- Hazardous waste

4.22.2 Anticipated Indirect Impacts

Land Use

The most prominent and influential indirect impact of the project is related to likely land use changes throughout downtown Edmonds. Under either of the build

alternatives, the ferry terminal would be relocated away from the retail core. Area vacated by WSF would become available for redevelopment that would reflect the vision of the City's Comprehensive and Downtown/Waterfront plans. If the terminal were to be relocated to Point Edwards, the underutilized area between SR 104 and the waterfront north of Dayton Avenue (primarily the old Safeway property) could be redeveloped to help to integrate the downtown and the waterfront (much of the area would be used for the multi-modal center and associated parking facilities under the Mid-Waterfront alternative). Relocation of the ferry terminal, particularly to Point Edwards, would likely stimulate commercial and multi-family residential development farther to the south and west and thus enlarge, and possibly shift the center of, the downtown retail core.

Traffic

With this likely change in the land use would come changes in traffic patterns. Ferry traffic would no longer interrupt traffic in the downtown retail core (this would be particularly noticeable under the Point Edwards Alternative where ferry-bound traffic would divert from downtown-bound traffic approximately 2/3 mile south of downtown); downtown retail establishments would be much more accessible during ferry loading and unloading operations. With the envisioned changes of land use, traffic would likely spread over a larger area.

Noise

The anticipated changes in land use, traffic patterns, and the general activity level in the vicinity of the project area would increase ambient noise levels as well. Because the current ambient noise levels in the area are relatively low, increases in traffic noise should not exceed FHWA noise abatement criteria for sensitive receptors.

Wetlands/Wildlife

Particularly related to the Point Edwards Alternative, as development would likely push south and west, there may be increased development pressure placed on Edmonds Marsh and developable land in the vicinity of the multi-modal center. While the City is firm in regards to protecting the Marsh, intensification of development in the Harbor Square property and on the hillside south of the Marsh could result in further losses of wildlife habitat.

Drainage/Water Quality

The indirect changes in land development patterns in the vicinity of the project area may result in a minimal increase in the amount of impervious surface area, and thus an increase in the volume of stormwater drainage to Edmonds Marsh. As previously noted in the Cumulative Impacts discussion, however, with the implementation of effective water quality treatment facilities in new nearby development (per City requirements), the water quality of stormwater runoff draining to the Marsh improve compared to existing conditions.

Social (Recreation)

Additional development in the enlarged downtown area would likely result in higher use of the waterfront parks. Under the Point Edwards Alternative, Marina Beach Park would be enlarged by incorporating the informal recreational area to the south. This increase in size, along with the preservation and enhancement of the other parks (due to the relocation of the existing ferry terminal and the rejection of the Mid-Waterfront alternative), should allow these recreational facilities to meet the future demands.

Economics

The indirect changes in land development patterns in the area would include new commercial/retail opportunities. The new development between the current retail core and the proposed multi-modal center (at either location) would generate a demand for supporting commercial activity.

Visual Quality

Intensification of land development and the anticipated enlargement of the downtown retail core would result in changes to the visual environment. Areas currently vacant or underutilized could be developed, including the highly visible hillside south of Edmonds Marsh.

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